

ROUTLEDGE STUDIES IN THE HISTORY OF ECONOMICS

Great Economic Thinkers from the Classics to the Moderns

Translations from the series *Klassiker der
Nationalökonomie*

Bertram Schefold



Great Economic Thinkers from the Classics to the Moderns

This is the opus magnum of one of the world's most renowned experts on the history of economic thought, Bertram Schefold. It contains commentaries from the series *Klassiker der Nationalökonomie* (Classics of Economics), which have been translated into English for the first time. Schefold's choices of authors for this series, which he has edited since 1991, and his comments on the various re-edited works, are proof of his highly original and thought-provoking interpretation of the history of economic thought.

Together with a companion volume, *Great Economic Thinkers from Antiquity to the Historical School: Translations from the Series Klassiker der Nationalökonomie*, this book is a collection of English translations with introductions by Bertram Schefold. The emphasis of this volume is on the theoretical debates, from the theory of value to imperfect competition; from money to the institutional framework of society; and from the history of economic thought to pioneering works in mathematical economics. This volume is an important contribution to the history of economic thought, not only because it delivers original and fresh insights about well-known figures, such as Marx, Stackelberg, Sraffa, Samuelson, Tooke, Hilferding, Schmoller, and Chayanov, but also because it deals with ideas and authors who have been forgotten or neglected in previous literature.

This volume is of great interest to those who study the history of economic thought, economic theory and philosophy, as well as those who enjoyed the author's previous volume, *Great Economic Thinkers from Antiquity to the Historical School*.

Bertram Schefold is Senior Professor at the Department of Economics, Goethe-Universität, Germany. He has published more than 40 books and 250 articles on economic theory, history of economic thought, energy policy and general economic policy. He edited the series *Klassiker der Nationalökonomie*.

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181 Comparisons in Economic Thought

Economic interdependency reconsidered

Stavros A. Drakopoulos

182 Four Central Theories of the Market Economy

Conceptions, evolution, and applications

Farhad Rassekh

183 Ricardo and the History of Japanese Economic Thought

A selection of Ricardo studies in Japan during the interwar period

Edited by Susumu Takenaga

184 The Theory of the Firm

An overview of the economic mainstream

Paul Walker

185 On Abstract and Historical Hypotheses and on Value-Judgments in Economic Sciences

Critical Edition, with an Introduction and an Afterword by Paolo Silvestri Luigi Einaudi

Edited by Paolo Silvestri

186 The Origins of Neoliberalism

Insights from economics and philosophy

Giandomenica Becchio and Giovanni Leghissa

187 The Political Economy of Latin American Independence

Edited by Alexandre Mendes Cunha and Carlos Eduardo Suprinyak

188 Jean-Baptiste Say and Political Economy

Text by Jean-Baptiste Say

Translated and edited by Gilles Jacoud

189 Economists and War

A heterodox perspective

Edited by Fabrizio Bientinesi and Rosario Patalano

190 Great Economic Thinkers from the Classics to the Moderns

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Contents

<i>List of tables</i>	vii
<i>Preface and acknowledgments</i>	ix
<i>Detailed Contents for Great Economic Thinkers from Antiquity to the Historical School</i>	xiii
Introduction	1
Two schemes for ordering approaches to the history of economic thought	1
Institutionalism and ordoliberalism	2
The development of economic theory since Adam Smith: an ordering according to the theories of value and distribution	8
1 Classicals	21
John Locke: a philosopher dedicated to economic thought	21
The Pamphlets from 1815: a shining moment for economic theory	28
Sismondi's <i>Nouveaux Principes d'Economie Politique</i> : classical liberalism, philanthropy, and the experience of history	41
Charles Babbage's <i>On the Economy of Machinery and Manufactures</i>	48
Karl Marx: the significance of the problem of the theory of the forms of value and the transformation of values into prices for capital	57
Karl Marx: circulation, productivity, and fixed capital	97

2	Monetary Theory	131
	Thomas Tooke's <i>An Inquiry into the Currency Principle</i> and the theory of distribution	131
	Walter Bagehot: political economist and publicist in the Victorian era	147
	Rudolf Hilferding and the idea of an organised capitalism	157
3	Neoclassicals	177
	William Stanley Jevons: the path to modern Utilitarianism	177
	Francis Ysidro Edgeworth's <i>Mathematical Psychics</i>	185
	Eugen von Böhm-Bawerk: discovery and error in the history of theories of interest	188
	Eugen von Böhm-Bawerk's <i>Positive Theory of Capital</i>	200
	Irving Fisher's <i>The Nature of Capital and Income</i>	216
	Irving Fisher's determination of interest and long-term equilibrium	229
	Vilfredo Pareto's <i>Manual of Political Economy</i> [<i>Manuale di economia politica</i>]	233
	Increasing returns, competition, and growth	244
	Antoine Augustin Cournot's <i>An Inquiry into the Mathematical Principles of the Theory of Wealth</i> [<i>Recherches sur les principes mathématiques de la théorie des richesses</i>]	260
	Rudolf Auspitz and Richard Lieben: <i>An Inquiry into Price Theory</i> [<i>Untersuchungen über die Theorie des Preises</i>]	264
4	Institutionalism	273
	Gustav von Schmoller as theoretician	273
	In between Historical School and modern Institutionalism:	
	J. R. Commons's Institutionalism	290
	Johan Åkerman's <i>The Problem of a Socio-Economic Synthesis</i> [<i>Das Problem der sozialökonomischen Synthese</i>]	299
	Alexander W. Chayanov's <i>The Theory of Peasant Economy</i>	310
5	Moderns	325
	Knut Wicksell's <i>Interest and Prices</i> [<i>Geldzins und Güterpreise</i>]	325
	Heinrich von Stackelberg's concept of equilibrium: the search for evolutionarily stable market behaviour	332
	Paul A. Samuelson's <i>Foundations of Economic Analysis</i>	345
	John R. Hicks's <i>Value and Capital</i>	348
	Alfred Müller-Armack's path: from interventionary state to the social market economy	353
	Market, policy, and society in Wilhelm Röpke	371
	<i>Appendix: The Series Klassiker der Nationalökonomie</i>	395
	<i>References</i>	413
	<i>Index</i>	439

Tables

1.1 Approaches to the history of economic thought	3
1.2 Development of economic theory since Adam Smith	5
4.1 Suggestive typology assigned to Lamprecht	280
5.1 Table of duopoly equilibrium	339



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Preface and acknowledgments

This book is a companion volume to my *Great Economic Thinkers from Antiquity to the Historical School*. Both document a large research project in the history of economic thought. They contain a planned, coherent, and amended selection of my introductions to the commentary volumes of the *Klassiker der Nationalökonomie*, translated into English. While the former book assembled the essays on authors of antiquity, the Middle Ages and Scholasticism, Mercantilism, the Historical School, and Asian and Arabian Classics, the present combines the essays on the Classical School, Monetary Theory, the Neoclassicals, the Institutionalists, and their descendants who are here, for lack of a better unifying term, grouped as the Moderns. The former book combined essays that dealt with the formation of economic thought, with the relationship between economic ideas and general history, hence with a relativist and political tradition of economic thought. The present book is more narrowly oriented on the positivist history of economic theory, hence on the analytical reconstruction of the theories of schools and individuals.

We take up part of the explanation provided in the Preface of the previous book, with some omissions and complements: The *Klassiker*-series was composed of 100 facsimile editions of Classical texts of economics, the facsimile being that of the first edition (in some cases, for texts older than the invention of printing, the facsimile was that of a manuscript). Each text was accompanied by a volume of commentaries, to which I usually had written an introduction. The focus is on the continental tradition, in a German perspective, but with a wide temporal and spatial horizon, going from antiquity to the twentieth century, and including not only European, but also Arab and East Asian authors; they were

chosen according to criteria which were explained in the Introduction to the previous book, together with the history of the edition of the *Klassiker*.

The initiative to have the essays translated came from the late Mark Perlman, who thought that these texts might provide an insight into currents which are alternatives to the Anglo-Saxon tradition. A selection had first been made by Volker Caspari; it was edited as *Beiträge zur ökonomischen Dogmengeschichte. Ausgewählt und herausgegeben von Volker Caspari* (Scheffold 2004a). Here, for the second book, additional translations not contained in Caspari's selection and two essays on Marx first published in German outside the *Klassiker*-series have been included. Thus, the reader can form an opinion on the programme of the *Klassiker*-series as a whole (the complete list of the series is found in the Appendix). The series, to the extent that it resulted from my choices, but especially the present selection of introductions, reflects my special interest in the modern revival of classical economic thought, which offers a rigorous theory of value but is open with respect to historically changing influences on distribution, demand, and employment. Where others have only mentioned the importance of social, political, and historical factors on economic development, I have increasingly sought to integrate the economic with historical and cultural approaches and demonstrated that the same endeavour can be observed in the normative economics of antiquity and the Middle Ages, in the intensely political texts of Mercantilism and Cameralism, and that the Historical Schools (in the widest sense, including Marx) continued this tradition as an interdisciplinary approach, combining economic, sociological, historical, and legal considerations, even psychology and cultural studies. *Great Economic Thinkers from Antiquity to the Historical School* was largely concerned with the emergence of economics as a specific dimension of social life. German ordoliberalism, represented here by Röpke and Müller Armack, is an heir to this tradition, despite its rejection of historicism and its reliance on Neoclassical modelling, especially in the case of Eucken. Neoclassical theory offers more partial insights, founded on more restrictive assumptions and models. Here we show how differentiated Neoclassical Theory could be and yet united by a common vision of how commodity and factor markets should be analysed by reducing supply and demand to preferences, endowments, and technology. The Classical School, with which we begin, differed primarily with regard to the theory of distribution and employment but used, in essence, the same theory of normal prices. We present an attempt to explain the relationship between these schools schematically in the following Introduction.

I first shrank away when Mark Perlman asked me to translate the essays, because of the time it would take, but also because I felt that I was not up to the task. It is one thing to write, as I have often done, in a foreign language on matters of pure theory, where the vocabulary is given, and another on cultural matters. In these essays I felt free to use a more literary prose, since the *Klassiker*-series addressed a more general public. In the end, Mark Perlman provided a generous grant from the Earhart-Foundation to pay for the translation. He added a subsidy himself, and the translation of the additional essays was financed by the Other Canon Foundation, with the help and encouragement of Erik Reinert, and

a further subsidy was granted by the Vereinigung von Freunden und Förderern der Johann Wolfgang Goethe-Universität.

The book thus has been translated not by myself, but by Staci von Boeckmann and Stephen Starck, with, first, the exception of a few essays translated by Keith Tribe, who also revised most of the texts, and, second, the exception of the essays of the *Klassiker*-series not contained in Caspari's edition. These were translated by Daniel Steuer. My former assistants Sebastian Beck, Marion Hackenthal, Jan Hermann, Christian Klammer, Jens Reich, Susanne Rühle, and Christian Schmidt each read some of the texts critically and helped to check the references, in particular providing the standard English versions or translations of texts quoted in German in the original work. Secretarial work was provided by Reinhold Spieß and Erna Jeganathan. In the end, I read and corrected the entire manuscript. I am grateful for the encouragement I received, in particular from Mark Perlman, from Erik Reinert, and from the publishers, and I should like to thank the Earhart-Foundation, the Other Canon Foundation, the Vereinigung von Freunden und Förderern, the translators, and my collaborators for all the efforts they have undertaken.

Languages are to the historian of economic thought as indispensable as mathematics to the theorist and statistics to the econometrician. I have insisted that occasionally a quote be left in the original language, to give colour to the wording; translations of these quotes can be found in the notes. In the German edition, by contrast, most quotes were given in the original language.

My hope to have all of the contents in the commentary volumes of the *Klassiker*-series translated and published in English, as a collection or, as in German, together with the facsimile editions, could not be realized, no publisher being prepared to take the risk. The two volumes on *Great Economic Thinkers*, then, are a substitute, but I should like to remember the first editors of the *Klassiker*-series, Wolfram Engels, Herbert Hax, Friedrich A. von Hayek, and Horst Claus Recktenwald, and to thank Karl-Dieter Gröske and Arnold Heertje, who became co-editors later. A special thanks goes to Michael Tochtermann, the publisher from beginning to end.

Bertram Schefold
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Detailed Contents for *Great Economic Thinkers from Antiquity to the Historical School*

	<i>Preface</i>	vii
	Introduction	1
	From the history of economic analysis to a universal history of economic thought	1
	Classics of economic thought: a canon	6
	Some remarks on the introductions to the <i>Klassiker</i> -series selected for this book	8
1	Antiquity	14
	Xenophon's <i>Oikonomikos</i> : the beginnings of an economic science?	14
	Aristotle: the Classical thinker of ancient economic theory	31
	Cicero's <i>De Officiis</i> : the moral duties of mankind	51
2	Middle Ages and Scholasticism	75
	Nicholas Oresme: monetary theory in the late Medieval era	75
	Economy and money in the age of reformation	103
	Leonard Lessius: from the practical virtue of justice to economic theory	127

3	Mercantilism	159
	Spanish economic thought at the dawn of the modern era	159
	Antonio Serra: the founder of economic theory?	179
	Jacques Savary's <i>Parfait négociant</i> : The organization of markets by merchants and the state	191
	Philipp Wilhelm von Hörnigk: <i>Austria Above All, if She Only so Wishes</i>	215
	William Petty's <i>Political Arithmetick</i>	226
	Justi's <i>Grundsätze der Policy-Wissenschaft</i> [Principles of the Science of Police]: happiness and economics	238
	The connection between theory, history, and policy in James Steuart's <i>Principles</i>	247
4	Historical School, Old and Young	264
	Bruno Hildebrand: the historical perspective of a liberal economist	264
	Wilhelm Roscher's <i>Perspectives on the Economy from a Historical Standpoint</i>	284
	Hans von Mangoldt's: <i>Grundriss der Volkswirtschaftslehre</i>	292
	Karl Knies's <i>Das Geld</i> [Money]	295
	Wilhelm Roscher's <i>Geschichte der National-Oekonomie in Deutschland</i> [The History of Economics in Germany]	299
	Adolph Wagner's <i>Grundlegung</i> [Foundation]	304
	Wilhelm Launhardt's <i>Mathematische Begründung der Volkswirtschaftslehre</i> [The Mathematical Foundation of Economic Theory]	317
	Max Weber's <i>Protestant Ethic</i> as an inquiry into economics	320
5	Asian Classics	339
	Asian classics in a Western collection of the history of economic thought	339
	Ibn Khaldun's socio-economic synthesis: rise and fall in economic development	393
	<i>Appendix: The series Klassiker der Nationalökonomie</i>	395
	<i>References</i>	413
	<i>Index</i>	439

Introduction

Two schemes for ordering approaches to the history of economic thought

The history of economic thought is not the uncritical repetition of what others have said, but the attempt to order the ideas according to the contribution made to economic theory, according to the relationship of the theoretical contribution to general history and, in particular, in relation to the political goal which the theory helps to defend. Accordingly, the historian of economic thought can pursue one or a combination of three approaches, which we described in the Introduction to the earlier book *Great Economic Thinkers from Antiquity to the Historical School* (Schefold 2016c) and, more extensively, in Schefold (2016b). In the first book, we were primarily concerned with relativistic and political approaches, whereas the endeavour to understand and reconstruct analytical developments predominates here.

We distinguished three forms of the relativistic approach. Marxian materialism started from a linear view of history, with evolution driven by transformations of technology and corresponding forms of property, of appropriation and of ideological perceptions of the historical forms. Marx would later add other modes of production to the sequence of antiquity with slavery, feudalism with serfdom and capitalism with wage labour, discussing not only variants of these three but also oriental forms and primitive communism. In principle, the materialist explanation of evolution does not exclude a cyclical return of certain phenomena, and the progress of the theory is not necessarily cumulative; it may involve the abandonment of older theories and a later return to them. And materialism is not necessarily connected with the vision of socialism as the ultimate goal of history. Other theories, such as those by Max Weber, include idealist or, in more concrete terms, evolutionist explanations of historical transformations. The complexity of evolutionary processes has caused some to abandon the claim to predict the direction of evolution altogether and led to phenomenological descriptions of different 'styles' of development. Analytical or 'rational' theory is then thought to explain only aspects of economic mechanisms, while the descriptions are based on an understanding of the motivations and the historical logic of broader social processes.

The political approach considers the economy in relation to the state and focuses in particular on the forms of financing the state and the use of its expenditure. This may be exemplified by two contrasting examples of market economy: that of ancient democratic Athens as the model of an 'embedded' economy and

2 Introduction

liberalism as it developed in the nineteenth century. Table 1.1 summarises these views on the relationship between economic history and the history of economic thought, with references to important authors, with the characteristics of the history of economic theory, with the corresponding perceptions of economic history and associated attempts at periodisation, and, finally, with the conceptual framework and the relationship to normative economics.

The reader is referred to the earlier introduction and to Schefold (2016b) for a more detailed account of this meta-theory of the history of economic thought. The present book is more concerned with the history of economic analysis and its variants, which are not shown in Table 1.1, but for which we offer a scheme in Table 1.2.

We shall see that most of the essays in this volume relate to schools and deal with questions for which there is a schematic location in Table 1.2. However, one has to use these schematic subdivisions with care. To begin with, most historians of economic thought typically transcend a pure analytic history, even if they profess that this is their main interest. For example, although Schumpeter's *History of Economic Analysis* (Schumpeter 1954) dons this programmatic title, he was intensely interested in the relationship between economy and society and strove, as a young man, towards a unified socioeconomic theory in the first version of his *Theory of Economic Development* (Schumpeter 1951a), and his late book on *Capitalism, Socialism and Democracy* (Schumpeter 1942) is an example of such a synthesis, as Shionoya (1997) has shown. Conversely, there is more positive economics in, for instance, Max Weber than meets the eye.¹

We not only observe relativist elements or an ultimate aim to situate economic theory in a broader socioeconomic conception among Austrian economists such as Schumpeter. We also find that the contrast between the analytical program of Neoclassical thought and the Historical School led to a lasting debate as to the fruitful relationship between economics and social and cultural theories. Norms and institutions are created in reaction to the experience that market processes often do not function as neoclassical theory predicts. Politicians feel that they should overstep the limits indicated by pure liberalism, not only because of social concerns, but also in order to serve efficiency. The discussion of these contrasts belongs to this book, and they come up in two chapters, the one on Institutionalism, and the one on the Moderns, where German ordoliberalism is at stake.

Institutionalism and ordoliberalism

The chapter on Institutionalism begins with a contribution on Schmoller's *Grundriss*, written before I had become the chief editor of the series. I was asked whether I could find elements of Schmoller as a theorist, and, to the surprise of many, I found some (cf. 'Gustav von Schmoller as theoretician', chapter 4). Schmoller's vision can be seen in his formulation of the need for open historical investigations in order to discover concrete realities like the manifold forms and juridical constructions of what an economic institution was, is, or ought to be, from the family via handicraft

Table 1.1 Approaches to the history of economic thought

Type	Preferred designation/ authors	Epochs	Characteristics of the history of economic theory	Perceptions of economic history	Associated periodisation of economic history	Conceptual framework	Value judgements
Positivistic	History of economic theory, history of economic analysis, e.g. Schumpeter	Since 18th century (beginnings in mercantilism)	History of discovery, history of progress, formation of a theory	The economic problem is a-historical	E.g. (technical) stages (Rostow)	Model building, mathematical formulation, analytical reconstruction of theories	Ideal of value-free analysis: analysing the practicality of given goals
Relativistic	Objectivist history of economic thought, e.g. Marx (theories of surplus value)	All history of mankind	“Progress” possibly not only cumulative, but also substitutive and cyclical	Materialistic type: base and superstructure (Marx); technology as main determinant in (liberal) economic history	Mode of production (esp. antiquity/ feudal/ capitalist)	Materialism claims to derive the genesis of necessary false appearances	Theory serves class interest (Marx)
Culturalist	history of economic thought, e.g. Max Weber (Protestant ethic)		Theories historically relative because of differences in rationality	Idealist variant: changing goal orientation	Modern capitalism = ‘rational’ capitalism, Protestant thesis	Ideal type	Theory does not justify values but allows to relate them (Weber)

(continued)

Table 1.1 (continued)

Type	Preferred designation/ authors	Epochs	Characteristics of the history of economic theory	Perceptions of economic history	Associated periodisation of economic history	Conceptual framework	Value judgements
	'Visual' theory encompasses 'rational' theory		Formation of ideology in an institutional context	Economic styles (Spiethoff)	Features of the economic style	Hermeneutics, semantics	Evolution of values regarded as immanent in development
Political	History of political economy, e.g. Edgar Salin	Since state formation, high cultures	Entanglement of economy and politics	Striving for harmony of politics and economy, 'embedding'	Political and cultural, corresponding to the high cultures	Philosophical orientation towards the good life	Images of the good life; religious ethics
			Theory expresses the independence of the economic process	Economy becomes political, because social and economic class formation coincide (esp. 18th and 19th centuries)	'Capitalism', 'real socialism'	Terms serve political debate	Freedom and social justice to be reconciled

Table 1.2 Development of economic theory since Adam Smith

		Prices in period:		Distribution	Employment	Accumulation	Money and price level
		Short	Long				
Tradition		Just Price		Just Wage			
	Classic:	Market prices	Natural prices Production prices Normal prices	<ul style="list-style-type: none"> Natural rates Real wage given (<i>Mathus</i>) Profits residual 	<ul style="list-style-type: none"> Capital limits employment Say's law Theory of crises (<i>Marx</i>) 	<ul style="list-style-type: none"> $r \downarrow$ because of: <ul style="list-style-type: none"> competition inferior land increasing organic composition of capital 	Law of circulation with $M = \frac{PT}{V}$ <ul style="list-style-type: none"> T: accum. V: $V(i)$ P: Value in terms of gold
	Neoclassic: Walras Marshall	Marshall's short period, later administrated prices		Marginal productivity theory	Full employment of factors	$K/L \uparrow \leftrightarrow r \downarrow$	Quantity theory (<i>Fisher</i>)
Keynes		None		Effective demand	Stagnation: $i \downarrow$	$M = \frac{T \times P(w)}{V} + L_s(i)$	
Modern Neoclassic	Temporary equilibria	Intertemporal theory		I = S; perfect foresight; monetary policy		Neo-quantity theory (<i>Friedman</i>)	
Post-Keynesians	Full cost principle (<i>Kalecki</i>)	Neo-Ricardian price theory (<i>Sraffa</i>)	$r = \frac{g}{s_c}$ $P/W?$ $r = i?$	Effective demand $g_N = g_W$	$r = \text{const.}$	M endogenous cost push versus demand pull	

6 Introduction

to modern companies. He will always be admired for the mastery in his representation of such phenomena by all of those who like to be carried away by their love for historical detail. Schmoller as a 'theorist' might refer to the methodological defence of such an interpretation as the task of the historically oriented economist. But this was not my primary interest; I wanted to know what economic theory in the ordinary sense Schmoller would use in his investigations, explicitly or only implicitly, and which areas of economic theory would thus be touched. It turned out that he used neoclassical theory without scruples where it seemed useful, but that a major theoretical effort could be seen in his attempt to distinguish more than a dozen different types of evolutionary theory.

The generation of economists following upon Schmoller, many being his pupils or their students, split in different directions, as is usually the case with the inheritance of a great intellectual figure. Some continued in his style, and some became more empirical, basing their work increasingly on quantitative methods, such as Mitchell in the United States. Some turned to a more descriptive and intuitive theory in the broad historical perspective and at the same time to more formal theory for the analysis of special phenomena such as the business cycle – Spiethoff excelled in both camps (Spiethoff 1925). It became clear through the work of the latter, if one had not seen it before, that the adherents of the Historical School tended to assume that there was a certain kind of cultural unity, rooted in mentalities and institutions, that characterised different economies, national or regional, in certain epochs. Spiethoff spoke of 'economic styles' (Spiethoff 1932). This interest did not exist in the same degree in American Institutionalism, which otherwise continued the work of the Historical Schools in Germany and elsewhere and added the detailed study of specific institutions as something of its own. This was based, in the case of Commons, on an extensive study on the development of Common Law and the large organisations of economic interest, such as the trade unions (cf. 'In between Historical School and modern Institutionalism: J. R. Commons's Institutionalism', chapter 4, and Schefold 1995d). The Historical School, this older American Institutionalism and modern Institutionalism form a sequence in which there is an important continuity in the recognition that economics must adapt to the understanding of specific historical circumstances. However, there are also important discontinuities. The descriptions of culture on the basis of empirical ethics now is left to others – sociology has taken that over – while the institutional enquiries get more focused and, eventually, the emergence of institutions is analysed in terms of economic advantage and in the context of an international rivalry of nations (North 1990).

As the knowledge of economic theory broadened, a desire grew to describe the relationship between history and theory more accurately. Among the many attempts to explain this relationship and to assign the tasks to different subdisciplines, the book by Johann Gustav Åkerman stands out (cf. 'Johan Åkerman's *The Problem of a Socio-Economic Synthesis*', chapter 4). Åkerman was a strong critic of the use of static comparisons for causal analysis and was interested in dynamics at a time when economic theory was making great advances with Keynes's general equilibrium theory and Schumpeter's business cycle analysis. Åkerman

regarded the interdependence in equilibrium economics, the causal analysis in evolutionary processes, and the analysis of norms in sociology as complementary principles, and he endeavoured to show how the three taken together helped to explain social transformations.

I also inserted Chayanov's 'Theory of Peasant Economy' (cf. 'Alexander W. Chayanov's *The Theory of Peasant Economy*', chapter 4) into this chapter as an outstanding early example of how the analytical tools of Neoclassical economics could be used for the analysis of social formations for which they had not been designed. Chayanov wished to show how the communitarian institutions of traditional Russian peasants in families and villages might be developed towards a kind of socialism substantially different from the socialised industrial economy under authoritarian rule that Stalin would bring about. Chayanov's analysis of gift giving, of sharing of tasks and of production, and of the efficiency and inefficiency of rules and institutions was path-breaking and still is a model for a combination of Institutional and theoretical approaches.

Also in the 1930s, Heinrich von Stackelberg was a pioneer in the analysis of oligopoly and showed that there could be multiple equilibria of different kinds; the 'Stackelberg Solution' has remained as the name for a specific type of equilibrium in the theory of games (cf. 'Heinrich von Stackelberg's concept of equilibrium: the search for evolutionarily stable market behaviour', chapter 5). This was a great analytical advance. More problematic was the use Stackelberg made of his discovery when he argued that the choice between different equilibria could not rationally be made by the market and that the state had to intervene, for he did not think of a democratic procedure but of the intervention of a corporatist state, with which he sympathised because his family had been persecuted by the Soviets.

German ordoliberalism originated during the Second World War as a reaction to the threats of Soviet Communism and Nazism. Famous is the story of how the Freiburg School, with Walter Eucken as its leading exponent, revived liberalism in a secret circle under the dictatorship. Eucken argued that the framework within which a market can work efficiently must be organised and that, in particular, intervention by regulation is needed, if its absence would lead to a natural monopoly or in order to counter tendencies to form cartels. In particular, a systematic order is needed to create the institutions necessary for the maintenance of a stable monetary system. The book deals with Alfred Müller-Armack, one of the German Pre-Keynesians in the late 1920s who had understood the precariousness of the process of investment in an uncertain world (cf. 'Alfred Müller-Armack's path: from interventionary state to the social market economy', chapter 5). For a short while, he hoped that the Nazis would stabilise the economy, but he withdrew from the Nazi movement in order to write a book on economic history (to be precise: on economic styles), in order to keep his distance from demands from the government. He developed the conception of the social market economy during the war and was one of its chief architects under Erhard, the Minister of Economic Affairs, afterwards. He was also one of the first senior political economists to take environmental concerns seriously and to demand a further transformation of the

social market economy on account of that. Wilhelm Röpke was one of the few uncompromising liberals who, as one of the German Pre-Keynesians, stood in opposition to the Nazi regime from the start and emigrated to Turkey, although, being young, fair-haired and tall, intelligent, and neither Jewish nor socialist – the image of the ideal of a young German – he could have risen to high rank under the new regime, if he had adapted to it (cf. ‘Market, policy, and society in Wilhelm Röpke’, chapter 5). From Istanbul, he was called to Geneva. He developed a wide-ranging activity from there as an ordoliberal who favoured small-scale production and, where possible, local self-organisation and democratic forms of government. As a liberal, he was suspicious of the trend to the concentration of economic power associated with the process of European unification.

The development of economic theory since Adam Smith: an ordering according to the theories of value and distribution

As an economist, I was mainly educated in Cambridge under the influence of Joan Robinson, Piero Sraffa, and Nicholas Kaldor, and I was later influenced by Piero Garegnani. Our intellectual universe consisted of the blocs of theory mentioned or alluded to in Table 1.2, with the theoretical relationships it implies, and we knew, and wanted to know, little else. A broader interest developed after I left Cambridge. I began to lecture on the history of economic systems. This caused me to study some economic anthropology and older – in particular, ancient – texts in the history of economic thought. The knowledge so gained helped me, when I took over the project of the *Klassiker*-series, and the previous volume contains the results. But I continue to be convinced that the structuring of economic theory as taught in Cambridge represents the best approach for understanding how the different schools are related to one another. To explain this scheme is the main purpose of the present introduction.

Older theoretical traditions of the Mercantilists, the Middle Ages, and the ancients played no significant role in what I learnt at Cambridge. Even physiocracy was not mentioned often. Only two continental economists loomed large: Marx and Walras. Occasional reference was made to English predecessors such as Petty or Locke. We have the essay on Locke in this book and that on Petty in the former (cf. ‘John Locke: a philosopher dedicated to economic thought’, chapter 1).² These authors are two pillars in the bridge that leads from mercantilism to the Classical period. The story of how the philosopher also got interested in economics is fascinating. Of historical importance is his contribution to what may be called the qualitative labour theory of value or the idea that property originally is appropriated through labour, therefore by tilling the soil, whereas the hunting of the Indian in the forest does not justify the appropriation of land. The apology of New England colonialism is balanced by an explanation of land rent and of interest from capital, which hints at the problem that neither income is based on the expense of own labour. The analysis contains fascinating insights and impressive arguments; it is liberal in its tendency but still far from founding a full liberal system.

So we must begin by reading our Table 1.2 from the top left, where the classical authors are conventionally represented by Smith, Ricardo, and Marx. The heading begins with a distinction between market prices and natural prices. The Smithian theory of market prices does not stand on its own feet. It is really a collection of anecdotes of why market prices may be different from natural prices, and the market constellations described correspond to what mercantilists and earlier authors had known. The point is that market prices gravitate to natural prices – an image chosen intentionally by Smith as an author on astronomy. Smith takes the effectual demands for the quantities of commodities as given and adds up the components of the price: wages, profits and land rents, with past inputs of means of production similarly reduced to these cost components. If demand and supply do not correspond to the natural price, the market price will be above or below the latter, hence producers will be induced to produce more or less. If capital and land are absent, relative prices will be equal to relative labour values, and prices can be measured in labour time. If labour is assisted by capital and land, prices can still be expressed in terms of labour time by using the Smithian concept of labour commanded. The labour commanded of any commodity is more than the labour embodied in it because of the elements of profit and rent, and labour embodied will be more than direct labour used in the immediate production of the commodity because of indirect labour contained in the means of production. But, in a regress, Smith would express all costs, including profits, also in terms of wages, profits and rents, earned when the means of production were themselves produced. Contrary to Marx's allegation, there was no contradiction between the labour theory of value and the measure in terms of labour commanded: prices were determined by adding up normal costs and expressed in terms of labour commanded, and this coincided with labour embodied and direct labour in the absence of capital and land.

The merits and difficulties of the Smithian theory of value have been discussed by the classical authors and their successors ever since. It is clear that it could convince only if the components of the natural price could be explained. He accepted the traditional notion of a subsistence wage, and he insisted more on historical elements determining it, with national characteristics, than other authors. A major step was to assume that profits would be earned in proportion to the capital advanced, so that the main result of the convergence of market prices to natural prices consisted in the emergence of a uniform rate of profit. However, he had no theory to explain the level of the rate of profit and thought that it would gradually fall under the pressure of competition. His theory of rent was not successful either. Rent was a monopoly price; this is correct in a sense but does not say much.

Here Ricardo came in with his famous theory of rent, which he first developed in his Corn Model, and this is where our essays begin: with a survey of the four pamphlets which, in 1815, formulated the theory of differential rent (cf. 'The Pamphlets from 1815: a shining moment for economic theory', chapter 1). According to Sraffa's interpretation, Ricardo here solved Smith's problem of the determination of the rate of profit: If in agricultural production corn is produced by means of corn,

corn representing the seed as well as the wage of the labourers, the corn produced on the least productive land still cultivated will, after deduction of these expenses, define the rate of profit which must prevail also on the better lands. Profits therefore are a residual in the surplus. The rate of profit will fall, if, with the growth of population, there is a transition to inferior lands so that, in the absence of technical progress, without access to fresh territories and with constant wages per man, the surplus at the margin will fall and consequently also the rate of profit.

There has been some controversy as to whether Ricardo really made the daring abstraction from other means of production besides corn and labour, but, as the essay on the Corn Pamphlets shows, a number of successors of Ricardo have used the corn model. This comes out most strikingly in Marx, when he polemicalizes against this abstraction and argues for his method to go from Smith to a full theory of normal prices, not taking physical quantities of corn as given but by starting from labour values, which then are transformed into prices of production. It can perhaps not be proved beyond doubt that Ricardo thought of a pure corn model, but it is certain that a pure corn model was discussed and used among the early Ricardians.

Classical economics are best visualised by imagining a capitalist industrial economy gradually growing within a pre-capitalist environment. As capital is being accumulated, people migrate from the surrounding countryside to the new centre and become employed as workers. In this sense, the labour supply adapts to demand. The notion of full employment therefore is ambiguous (and it is not used as such in the classical literature) because it may be said that the workers in the centre are fully employed, but workers in the world as a whole are not – at any rate not as wage earners in the new capitalist system. Moreover, there may be temporary lay-offs, if there are industrial crises endogenous to the system and therefore different from the traditional fluctuations of harvests. We here study Sismondi with his great work on the nascent industrial economy, where the possibility of crises is perceived and where their social consequences are noted (cf. ‘Sismondis’s *Nouveaux Principes d’Economie Politique*: liberalism, philanthropy and the experience of history’, chapter 1). The critical perspective in Sismondi is connected with his interpretation of history and his vast knowledge of French Medieval and early modern Italian conditions.

It may be mentioned in this perspective that Say’s Law implies that total output may be bought out of total proceeds. The present level of employment could thus be maintained by means of a stationary reproduction of output. This does not mean that there is full employment; it only means that the present level of employment can be maintained. Existing unemployment within the capitalist core or in the surrounding countries will only be absorbed to the extent that there is saving, an accumulation of capital and growth. A crisis, conversely, does not break out only because a few individuals incidentally decide to save instead of spending. A general crisis presupposes that a substantial fraction of all income receivers decide not to spend. This will happen only if there is some event or development inducing them to do so, such as a tendency to the over-accumulation of capital. This may result in a boom in which future demand and hence the necessity

for investment to satisfy demand is overestimated in conditions of uncertainty (Alcouffe, Poettinger, and Schefold 2016, forthcoming).

The classical economists on the whole believed that growth and accumulation would go on for a long time, but their opinion differed a great deal as to the origins, outcomes and likelihood of crises or, more generally, economic fluctuations. Most of them took the hypothesis that the rate of profit would fall over time as a fact (see Table 1.2), but they differed in their explanations. Smith saw it caused by competition, Ricardo by the transition to inferior lands in the absence of technical progress and Marx argued that, on the contrary, it was connected with technical progress. For the main forms of technical process which he identified, increasing co-operation, deepening of the division of labour, and mechanisation, had in common that the quantity of raw materials used relative to labour was increasing, and the tendency to use such methods of production was dictated by the need to fight off the claims of workers for higher wages and for more influence on working conditions so that the inducement to save workers was the main concern shaping technical change. This would lead to an increasing weight of machinery and raw materials relative to work or to more 'constant' capital relative to 'variable' capital, hence to a rising 'organic' composition of capital, so that the share of profits would have to increase, but if this was limited, the rate of profit had to fall.

This book contains two essays on Marx's economics, which were not part of my introductions to the *Klassiker*-series but belong to the complex of my work for the *MEGA* (cf. 'Karl Marx: the significance of the problem of the theory of the forms of value and the transformation of values into prices for capital' and 'Karl Marx: circulation, productivity and fixed capital', both in chapter 1). Marxian economics is amazingly rich, and my interpretation of Marx has shifted over time. My criticism of the Marxian transformation of values into prices had recently to be modified in view of the discovery that the theory of random matrices leads to a representation of technologies which, as a subset of all conceivable technologies, permit a transformation of values into prices such that the conditions Marx attached to the procedure are fulfilled: profits then *can* be represented as a redistribution of surplus value (Schefold 2016a).

The Classical economists wrote under the impression of the impact of the first wave of the Industrial Revolution. A great classical treatise looking at the process from the point of view of the transformation of technology is the book by Charles Babbage on machinery, interesting because it traces a certain logic of discovery which still holds in the age of information technology, of which Babbage himself was a pioneer (cf. 'Charles Babbage's *On the Economy of Machinery and Manufactures*', chapter 1).

To integrate money into the Classical Theory of accumulation was easier than to integrate money into Neoclassical Theory, because money essentially was based on a commodity currency, and the commodities of which the currency consisted, gold and silver, were being produced. Seigniorage, however, is a complicated matter, as the reader of medieval and early modern treatises on money will realise.³ If the state renounces to net seigniorage and if the commodity currency is gold,

the material is so precious that minting costs are insignificant in a first approximation, so that the purchasing power of gold coins corresponds to that of equal quantities of gold prior to minting, and the exchange rates between other commodities and gold are given by relative costs of production, including normal profits. Locke is one of the authors who renders the idea of a constant velocity of circulation plausible by describing how workers spend their wages as they receive them daily or weekly, while shopkeepers collect the money and buy stock only spasmodically. The rent payments occur four times per year. There is an average velocity of money, which, multiplied by the quantity of money, must equal the volume of transactions multiplied by the prices. But prices in terms of gold are given, and the volume of transactions follows from the theory of accumulation. Hence, the quantity of money is, in the long run, an *endogenous* quantity, as the last entry in the first row of Table 1.2 indicates. As we saw in the earlier book, Copernicus understood better than modern authors how it is the quantity of – in his case – silver in monetary form that adapts. Excessive minting, if the money is spent by the prince, causes demand and hence the price level to rise, so that silver coins become cheaper in terms of commodities and, therefore, also cheaper relative to silver in other uses; silver coins will then be melted down, be that permitted or not. If, conversely, there is a lack of coins, coins will appreciate, and silver will be offered to the mint. Among the classical authors, Marx was the one who most consistently adhered to the idea of the determination of the price level by the cost of production of precious metals. Other Classical authors left more room for the quantity theory, at least for the short run, in which the quantity of the circulating medium cannot be expanded or contracted.

Gold and silver are expensive means of circulation, so they will be substituted first with coins made of other metals, which renders a system of commodity moneys quite complicated, due to a tendency to deflation for the precious coins and inflation for the inferior coins, of which the state will be seduced to produce too many. Moreover, coins will be used up to different degrees and therefore lose part of their value in international exchange, leading to rates of conversion which are different from official exchange rates between different kinds of money. Furthermore, there are forged coins, to mention only the main causes for complication. Modern fiat money is much simpler.

Only a specialised literature addressed these problems. Its major purpose is to explain how expensive forms of circulation on the basis of precious metals were substituted not only by cheaper forms of commodity money but also by bank money, bills and other forms of credit. Banks used to issue private notes, which played a role similar to that of deposits today.

During phases of optimism, credit is easily granted as a means to save gold. The volume of bills outstanding then swells, similarly that of private notes and deposit accounts, but if the economy begins to tread on, a monetary crisis develops in which everybody tries to get outstanding loans paid and to convert insecure forms of credit money into safer forms. The public begins to flee from banks, the solvency of which is in doubt, in order to turn to the banks which appear to be solvent. In the nineteenth century, one then really felt secure only with gold.

Panics were most vividly described by Marx, but the emerging system of money and credit and its institutional development were described in a special literature in the nineteenth century, with the main authors being regarded as belonging to the Currency School or the Banking School, according to the roles they assigned to the instruments of credit. The following essays describe the work of Tooke (cf. 'Thomas Tooke's *An Inquiry into the Currency Principle* and the theory of distribution', chapter 2), a leading member of the Banking School, and that of Bagehot, the leading analyst of the institutional importance of the Bank of England as a lender of last resort (cf. 'Walter Bagehot: political economist and publicist in the Victorian era', chapter 2). It must rescue the banks which are still solvent but temporarily illiquid in a panic, by lending at high rates of interest against good collateral.

The classical authors in this book also comprise Hilferding, who was a follower of Marx; his book on finance capital was dubbed the fourth volume of *Das Kapital* (cf. 'Rudolf Hilferding and the idea of an organised capitalism', chapter 2). The description of his work is, as in other cases, connected with an account of his life and times. He was a socialist, but not on the Soviet side, and a major leader of German social democracy at its time of rivalry with the Communist Party in the 1920s. His persecution by the Nazis led to a tragic end. A key concept which he coined, the *Gründergewinn* ('promoter's profit'), expresses a nice corollary to classical thought. If an entrepreneur has founded a firm and made it prosper; if the profits of this firm can be expected to last and correspond to the profits associated with the general rate of profit; and if the rate of interest is considerably lower than this rate of profit, as both Smith and Marx believed would normally be the case, what then is the value of the firm, when it is transformed into a shareholding company? The profits, capitalised at the rate of interest, will lead to a value of the firm which exceeds that of the equipment, valued at replacement costs. The difference is promoter's profit, and the expectation to get it animates the spirit of investors who sell firms going public at the stock exchange.

We now consider the second row of Table 1.2, where the names of two main representatives of Neoclassical Theory appear: Walras and Marshall. They are not directly represented in this book but play an important role, insofar as they both consistently used the theory of normal prices. Marshall kept continuity with Ricardo in his use of normal prices for long period analysis. He added the main theory of what in the perspective of Smith are market prices for the short period, assuming rising marginal cost curves in the individual firm and consequently also in the market. In the very short run, quantities are given and the level of a market-clearing price is given by the demand curve alone. In the short run, the firms adapt to the price determined in the market as a whole by producing as much as corresponds to profit maximisation, therefore by setting the quantity such that price equals marginal cost. The long run now is defined precisely as the time it takes to enter or to leave the market. Depending on whether the quasi rents arising in the short run are positive or negative, other entrepreneurs are attracted by the market in question or leave it, and the long-run supply curve is horizontal, if the firms entering the market or leaving it are all of the same type as the firms already present.

The contribution on Cournot reminds the reader of the transitions between monopoly and perfect competition, which Cournot analysed in an ingenious manner (cf. ‘Antoine Auguste Cournot’s *An Inquiry into the Mathematical Principles of the Theory of Wealth*’, chapter 3). The Austrians Auspitz und Lieben arrived at similar results as Marshall (cf. ‘Rudolf Auspitz and Richard Lieben: *An Inquiry into Price Theory*’, chapter 3).

Table 1.2 indicates that the theory of normal prices extends to these early Neoclassicals. Normal prices can be found also in Jevons, but the essay concerning him mainly emphasises his critique of classical economics (cf. ‘William Stanley Jevons: the path to modern Utilitarianism’, chapter 3). The crucial question now is how the theory of normal prices could be combined with what is, after all, the distinguishing feature of Neoclassical Theory: marginal productivity in its function of regulating distribution. The transition entailed as a big change that full employment of the factors had to be assumed, if they were to receive a positive remuneration. While it is conceivable that some special kind of land is not employed fully, so that its differential rent falls to zero, the same cannot be the outcome of the pricing of homogeneous labour. If prices of factors are determined by supply and demand, similar to the prices of goods, the quantity of labour to be employed must at least receive a subsistence wage. The Neoclassicals observed, of course, that temporary unemployment occurs, but the theory assumed shapes of the supply and demand curves guaranteeing a return to full employment, in the absence of disturbing influences, such as trade unions enforcing wages which were too high.

Even more thorny is the problem of the supply and demand of capital. If the rate of profit is uniform, if equal profit is earned on equal quantities of capital advanced, the quantity of capital must consist of means of production, priced at normal prices, such that it can be confronted with a demand curve for capital which determines the rate of profit. It is clear that one here moves in a circle, in that priced capital goods are needed to formulate the supply and demand curves, but only the confrontation of the given capital with the demand curve yields the rate of profit, which one needs in order to determine normal prices in the first place.

The Neoclassicals were not all equally aware of this difficulty. They had to assume that, somehow, a simultaneous determination of prices took place, as a solution to the problem of circularity. This emerges most clearly in Walras’s theory of capital formation, where the normal prices and the rate of interest are endogenous variables (the rate of interest being what corresponds to the normal rate of profit in his version of the theory). Many of the papers in this volume allude to this problem of capital theory. For my present estimation of their seriousness, I must refer to more recent papers (Schefold 2013, 2016d).

Walras assumed that the capital goods needed to produce consumption goods were available in arbitrary proportions, as inherited from the past, and that they were used to produce consumption goods. The production of consumption goods according to given preferences implied that some capital goods were more needed than others. At the same time, Walras assumed that saving was going on, remunerated by interest. His equilibrium, modernised with inequalities to make

sure that economically meaningful (non-negative) solutions existed, therefore was such that those inherited capital goods, less intensely needed for consumption goods production, could be used to produce new capital goods as investment for the next period. But the proportions in which these new capital goods came up now were arbitrary, so that a sequence of such equilibria was likely to show violent structural change, and, in a modernised form of these equations, it turned out that possibly not even one of the capital goods was reproduced (Schefold 2016e). Earlier forms of this critique by Garegnani, Eatwell and Petri had pointed out that normal prices for capital goods were inconstant with their availability in arbitrary proportions, so that only those most scarce would be reproduced.

A Neoclassical solution to this problem consisted in the assumption that capital was given as a value magnitude, but not in its physical composition, and that, on the contrary, the physical composition that would lead to a steady state at the given preferences would be determined endogenously in the model (the proportions in which capital goods are needed are endogenous in classical and Keynesian demand-led theories of growth). The difficulty of Neoclassical Theory is due to the fact that a supply of capital must be defined so as to determine its price in the interaction with demand. Because of Wicksell effects, reswitching and reverse capital deepening, the demand curve for capital need not exhibit the inverse relationship between the quantity demanded and the rate of interest, which would be required for a stable equilibrium. I have modernised the 'old' Neoclassical approach recently. It leads to a solution which is quite similar to what one obtains if one assumes an aggregate production function, similar insofar as an aggregate of capital is given, but on top with output also dealt with as an aggregate. It turns out, again, that both constructions work if the technology exhibits random properties, similarly to what had to be assumed for Marx, if one wants to find the conditions for an economy in which aggregate profits can be explained as aggregate surplus value (Schefold 2016a). This is a rationalisation of the 'old' Neoclassical approach, which aims at determining long-run equilibria, in which the rate of profit is uniform. The 'modern' Neoclassical approach in intertemporal general equilibrium analysis starts from given endowments in arbitrary proportions and therefore is characterised by own rates of interest, which differ for different commodities, so that there is no uniform rate of profit, except possibly as a tendency towards a future state. This will come up with the 'modern Neoclassicals' in Table 1.2.

I had not yet reached these results when I was working for the *Klassiker*-series, but I was interested in the understanding of the Neoclassical economists of the classical scheme of normal prices. It turned out, confirming Garegnani (1960), that some, but not all, Neoclassicals were acquainted with the more sophisticated properties of the theory of normal prices. Ricardo, when moving from the Corn Model to his Principles, encountered the curious effect that with prices expressed in terms of gold, an increase of wages led to a cheapening of commodities produced in industries with a high intensity of capital. For as the wage rate rose, the rate of profit had to fall. The rise of the wage rate caused the price of the commodity produced in the capital-intensive industry to rise, but the fall of the rate

of profit had the opposite effect, and capital intensive was an industry in which the latter effect predominated. Gold was apt to express the relationship between the rates of wages and of profits, since the intensity of capital in gold-producing industries was – in Ricardo’s view – supposed to be of an average composition. Böhm-Bawerk equally knew that, accordingly, a fall of interest would not cause all prices to rise. But this had been asserted by his intellectual opponent Irving Fisher, who thought that prices of goods should be derived from discounting the expected returns generated by their use, and if the expected returns are regarded as given, a fall of the rate of interest will lead to a rise of all prices (cf. ‘Irving Fisher’s *The Nature of Capital and Income*’ and ‘Irving Fisher’s determination of interest and long-term equilibrium’, both in chapter 3). Böhm-Bawerk, by contrast, had understood that prices had to correspond to cost, as well as to future discounted returns, in a long-run equilibrium (cf. ‘Eugen von Böhm-Bawerk: discovery and error in the history of theories of interest’ and ‘Eugen von Böhm-Bawerk’s *Positive Theory of Capital*’, both in chapter 3).

The reader who used to think of the opposition between Classical and Neoclassical Theory as that between ‘objective’ and ‘subjective’ theories of value and between socially conditioned preferences (the distinction between ‘necessaries’ and ‘luxuries’ in the classical authors) and individually given preferences will perhaps be surprised that we here base the distinction between ‘Classical’ and ‘Neoclassical’ Theories on the treatment of the problems of value in relation to the concept of capital and the determination of distribution and employment. I believe, in fact, that a history of political economy should concentrate on the latter connection, in order to explain growth and accumulation. The theory of demand has made some progress, conversely, for it has helped to rationalise the theory of utility, in particular by deriving indifference curves from preferences, so that analytical tools of the Neoclassical Theory of demand become applicable in the Classical contexts. Since we are mainly interested in political economy, we should in this context also note that the theory of the falling rate of profit did not survive, but Neoclassical theory retains the idea that the intensity of capital and the rate of interest move in opposite directions, and this is shown in our Table 1.2.

The quantity of money was almost generally regarded as exogenous after the turn to Neoclassical Theory, even for commodity money, since it was thought that the annual supplies of gold were dwarfed by the stock already available. A textbook version of the quantity theory was formulated by Irving Fisher. Knut Wicksell started from the observation that the excess of the natural over the monetary rate of interest would cause inflation in a cumulative process. An artificially lowered money rate of interest would raise demand, prices, and profit expectations, and the rising trends of these variables would re-enforce one another. This was not yet the Keynesian theory, for the expansion was seen as primarily monetary, hence as going on at full employment (cf. ‘Knut Wicksell’s *Interest and Prices*’, chapter 5).

The next line of Table 1.2 is concerned with the Keynesian revolution. Keynes was a Marshallian, when he wrote the *General Theory*, and his price theory certainly reflects the Marshallian theory of pricing of firms in the short run. In one sense, long-run prices are not present in Keynes, insofar as he is interested in

short-run equilibria, but the Keynes of the *General Theory* retained marginal productivity theory, and I think that he uses normal prices at least implicitly on occasion.

His main contribution, of course, was to introduce the theory of effective demand and the multiplier to determine the level of activity in the short run, on the basis of uncertainty. There is therefore no market for future goods, but there are only expectations regarding incomes generated by investment, so that his marginal efficiency condition closely corresponds to what Fisher assumed about the pricing of capital goods. The rate of interest was a determining factor of effective demand but not determined by it. He believed it to be fixed by convention in the long run, and that it would fall in the very long run, but, in the short run, it was determined by the demand for speculative purposes. This theory of money combines the earlier approaches in an original manner. The quantity of money is given, as was still customary at the time. Whether he would have moved towards a theory of endogenous money as the Post-Keynesians have done is an open question. He uses the quantity equation and takes the price level as given. The trade unions negotiate the money wage rate with the employers, and the entrepreneurs set prices in proportion to this wage rate or in such a way that the marginal product will correspond to the real wage at the given level of employment, for the volume of transactions follows from the multiplier. The demand for money for circulation therefore is given, so is the total quantity of money, and the excess of the latter over the former, is the amount of money held for speculative purposes by those who believe that bond prices will fall, so that a loss can be avoided only by holding wealth in liquid form. The interest rate that brings the money market into equilibrium then influences effective demand.

The modern Neoclassicals (next row in Table 1.2) have added a number of ideas to complement the Marshallian theory of prices. Our volume contains short contributions on Hicks (cf. 'John R. Hicks's *Value and Capital*', chapter 5) and Samuelson (cf. 'Paul A. Samuelson's *Foundations of Economic Analysis*', chapter 5) which touch on the conceptions of temporary and modern general equilibrium. Both authors contributed to the 'Neoclassical synthesis', which recognised the potential instability of capitalism as analysed by Keynes. One solution was to postulate that the shortfall of investment relative to saving might be avoided either if there was perfect foresight regarding future sales or by the correcting influence of the central bank, which would influence interest rates so as to stimulate investment. Curiously, the influence of Keynes could be played down to the extent that a new quantity theory of money resulted. This is not pursued in the present book, but the problem of general equilibrium comes up time and again. There is Edgeworth, with his theory of the indifference curves and the move from cardinal to ordinal utility and with what became the theory of the core of general equilibrium: if one likes, an analysis of the stability of equilibrium, based not on a successive setting of prices (*tâtonnement*) but on negotiation which leads to the contract curve (cf. 'Francis Ysidro Edgeworth's *Mathematical Psychics*', chapter 3). The core shrinks to a point, as the number of agents is increased in replica economies. Pareto is discussed, who, on one hand, perfected Edgeworth's move towards

indifference curves but, on the other, also tried a new approach to the construction of indifference curves based on differentials and introduced, in a different context, his concept of optimality (cf. ‘Vilfredo Pareto’s *Manual of Political Economy*’, chapter 3).

Both Edgeworth and Pareto avoided the Walrasian theory of capital formation and of the uniform rate of profit. After the Second World War, a new form of general equilibrium theory surfaced, after some antecedents in the 1930s, which used the idea of dated commodities, in order to define a formation of equilibrium for a whole series of periods, with a finite or, later, an infinite horizon, where the market in the first period consists of many markets for all of the goods to be produced and delivered in future periods. Supply and demand consist in promises to supply and deliver at all future dates, with perfect foresight and complete markets. The Keynesian problem of investment disappears. Investment simply consists of intermediate goods. Their supply is just adequate to build up the capacities needed to produce what in the future will be demanded, according to the promises. If equilibrium prices can be found – and their existence has been proved under quite general assumptions – prices are such that all markets are cleared: those for the endowments needed to produce the investment goods, those for balancing the supply and demand of future goods and those needed for furnishing the intermediate goods.

The endowments do not consist of an aggregate quantity of capital, but again, as in Walras, of quantities of different kinds of labour, of land, and of capital goods produced in the past. The question thus arises what this kind of general equilibrium is in relation to the older notions of the short and the long period. Intertemporal equilibrium has here been placed under the heading ‘long period’, first simply because the time horizon can be far away. It could be said that, on the contrary, one has to deal with the very short period, insofar as the endowments are rigidly given in fixed quantities (the supply to the market may be modified by the own demand of the owners). Such equilibria are characterised by uniform own rates of interest, but the own rates of interest are different for different commodities, since the scarcity relationships may be very different for different commodities, at least in the beginning, as we already stated. If there is a shortage of ovens for making bread, and there are large capacities for making cars in the first period, one expects that bread prices will be high relative to ‘normal’ circumstances and car prices low. If preferences of consumers do not change from period to period and if the supply of natural resources also is steady, one expects that relative prices in such an equilibrium will move towards what in the older theory was called the normal prices. This, in fact, can be proved and is known as the ‘turnpike result’ in other contexts. The efficiency of the intertemporal equilibrium implies that growth over many periods takes place along a path of steady growth, which means that the different own rates of interest adapt to a common rate of interest, which would correspond to the old notion of the rate of profit. I have discussed such a model of convergence elsewhere, together with the implications for the critique of capital theory. In this historical perspective, the intertemporal equilibrium, if it converges, can be looked at as a model of

market prices converging towards prices of production. This model of gravitation is special, in that it is based on market clearing all along and, of course, on the Neoclassical theory of distribution with its full employment implications (cf. chapter 18, in Schefold 1997e, where it is shown how the problems of capital theory surface also in the intertemporal context).

To complete our interpretation of Table 1.2, the last line on the Post-Keynesians would have to be interpreted. I shall be very brief on this here, since the *Klassiker*-series did not get so close to the present. It contains the debate on returns to scale (cf. 'Increasing returns, competition, and growth,' Chapter 3) conducted in the *Economic Journal* and eventually summarised by Keynes under his editorship, which did have implications for the modern non-Neoclassical theory, for it contained Sraffa's analysis of Marshallian economics, with the conclusion that Marshall, except for a few cases of lesser significance, had to assume constant returns to scale and therefore a horizontal supply curve in each market. Sraffa's theory of normal prices has historical roots in this discussion but also in the Classical Theory. The debate on returns to scale later emphasised increasing returns and the theory of imperfect competition. Much of post-Keynesian theory is based on the assumption of a competitive process which results in pricing policies aimed at keeping reserve capacities, in order to meet peaks of demand when these arise. Firms therefore operate in the area of falling short-run average costs, and prices are set with a mark-up on marginal direct costs.

This implies that higher levels of output are associated with a higher profitability of firms. A variety of models has been proposed to show how the theory of effective demand may be used to explain not only the level of output but also distribution. Table 1.2 refers to three theories of distribution in this context. There are the theories of power, according to which the share of profit or the share of wages is a result of the bargaining strength of employers and of employees. Another approach is the post-Keynesian theory of distribution, according to which profits depend on the spending of investment and on saving's behaviour, and if this is expanded to a long-run steady state, a possible outcome is given by the result that the rate of growth, divided by the saving's propensity of the capitalists, is equal to the rate of profit. This is consistent with the idea that a fuller use of capacity, thanks to higher demand, leads to higher profits. Finally, a variant of the theory discusses the relationship between the rate of profit and the rate of interest. Sraffa himself offered the hypothesis that the rate of profit might be determined exogenously by the rates of interest. His view is taken up in the present volume in the essay on Tooke, which we have mentioned.

Most Post-Keynesians endeavoured to show that the solution to their models of growth, which had been developed out of Harrod's growth model with the precarious equality between a natural rate of growth and a warranted rate of growth, entailed that the rate of profit would be constant. The traditional arguments regarding the falling rate of profit were taken up, but it was thought that the opposing forces would balance in such a way that the rate of profit could stay the same – an assumption and an interpretation of history which has been challenged time and again.

Post-Keynesian monetary theory, on the whole, postulates that the process of inflation depends on real factors, such as the pull of demand and the push of costs, depending on the macroeconomic state of the economy, and that money is endogenous. It is credit money, supplied at a certain rate of interest; the demand from banks depends on the loans they can make to the investing public, which then receives deposits. There are antecedents to this view, especially in the debates on monetary theory during the nineteenth century associated with the Classical Theory and here represented again by Tooke and by observations on Marx.

I hope we have shown in this manner that the major theories of the nineteenth and twentieth centuries can be grouped around this scheme, represented by Table 1.2, which is centred on the evolution of Anglo-Saxon economic thought from the Classical to the Neoclassical School and from the Keynesian revolution to the answers provoked by it. The universe of economics has grown wider. Other antecedents have to be sought, if one is interested in the socioeconomic dimension connected with problems of development, of global politics, or of societal transformations today.

Notes

- 1 I am thinking here of Max Weber's lectures on economics, which he gave as a young professor at Freiburg and Heidelberg. They have been edited recently (Weber 2009) and demonstrate how, at that stage, Max Weber used an eclectic combination of classical, Marxian, and Austrian ideas to explain capitalist development and growth. Traces of this synthesis can be found in the mature Weber, where the conceptual apparatus appears to be dominated by the new sociological categories, which he introduced and by which he impressed – and has continued to impress – his audiences (cf. Weber 2011).
- 2 Cf. 'William Petty's *Political Arithmetick*', in Schefold (2016c, pp. 226–38).
- 3 Compare the contribution on Oresmius and the Saxon mint controversy in *Great Economic Thinkers from Antiquity to the Historical School* (Schefold 2016c, pp. 75–103).

John Locke: a philosopher dedicated to economic thought**I.**

German idealism only tangentially touched upon economic questions and therefore did not leave any deep traces in the economic sciences. Marx's turn from interpreting the world to changing it only constitutes the exception that confirms the rule. English philosophy, by contrast, was far from limiting itself to an interpretation of the world and thus contributed more than many other disciplines to the emergence of political economy. Apart from Locke, we may think of Berkeley, Hume, Bentham, and John Stuart Mill. And Smith and Jevons held chairs in philosophy. The creation of the liberal order required establishing not only the tasks and the limits of state activities regarding the economy, but also a theory of property that, though with its roots in ancient Roman law, was re-established in the course of the development of natural law.

Among the preeminent authors of the economic literature of the seventeenth century, Locke was the only one with a comprehensive classical, and in particular philosophical, education.¹ His father was a lawyer, and with the help of one of his clients the young Locke, at the age of fifteen, entered Westminster School, a prototype of the English public school system. There, he was taught to study the classical authors in Greek and Latin, for six days a week over a period of six years. When, at the age of twenty, he enrolled in Christ Church College in Oxford in 1652 with the help of a grant, this programme of study was continued: the ancient languages, rhetoric, grammar and logic, and philosophy, especially Aristotle, but also history, Hebrew, and theology. After his examination and his election as a tutor of Greek, he gave lectures on Aristotle, Cicero, and other ancient authors. He would later defend the study of Greek as the basis of the Western sciences, despite the fact that a turn towards the applied sciences was a hallmark of his times. Nor did Locke ignore the study of the more recent sciences. He engaged with medicine, made contact with the famous chemist Robert Boyle, and conducted experiments. He also tried his hand at medical treatments. One of his patients was Lord Ashley, the later Earl of Shaftesbury, whose protection Locke enjoyed. It was for Ashley, then Chancellor of the Exchequer, that Locke wrote the text on the consequences of the lowering of interest, which we shall consider here. First written in 1668, it appeared in revised form in 1692.

During the first half of his life, little seems to have prepared Locke for the role of a great economist, if we leave aside that a strict discipline of thought helped him achieve a degree of stringency in argument that had rarely been reached before, and that his philosophy of natural law helped him in analysing the interests and rights of groups within society that were affected in very different ways by the state's fixing of a maximum interest rate.

However, Locke had not remained unperturbed by the turmoil of civil war, and he would soon take sides. Born in 1632, during the reign of Charles I, Locke attended Westminster School at the time the monarch was executed in 1649. Locke's father actually fought in the civil war. Cromwell's protectorate roughly coincided with Locke's time in Oxford. As a member of the diplomatic mission to Brandenburg in 1665, of the colonial administration, and of the Board of Trade, Locke would later play a role in the civil service and in politics.²

Locke's role in English politics as a radical, even as a conspirator, has been examined in minute detail. A book on the topic begins with the following dramatic passage:

The Secretary of State listened with intense interest as the man across from him confessed his involvement in a plot to assassinate the King and spoke of the activities of many others who planned to raise a general insurrection in England. Within hours of this confession, John Locke hastily departed from London, taking with him the unfinished manuscript of the *Two Treatises of Government*. Ahead lay six years of hiding and life as a political exile in Holland for the author of one of the classic works of Western political literature.

(Ashcraft 1986, p. 3)

The major themes of Locke's political philosophy are, indeed, immediately related to his experiences in life. The problems associated with an absolutism based on the French model pursued by Charles II and the question of religious tolerance, which was not at all a taken-for-granted ideal for a religious person like Locke, take centre stage. The combinations of political radicalism and the battle against absolutism, of democratisation and Protestantism, of bourgeois and capitalist entrepreneurial spirit, of respect for the faith of others and openness for the new science, were not as obvious from the very beginning as they appear in hindsight after the victory of the revolution of 1688. Locke was caught in the whirlpool of his times, and it was some time before he found firm ground on which to stand.

After his return to England, Locke's theoretical *magnum opus*, the *Essay Concerning Human Understanding* (1690), the *Two Treatises of Government* (the conception of which dates back to the time before his exile and was drafted under threat to his life), the text to be discussed here, and *Some Thoughts Concerning Education* (1693), all appeared within the space of a few years. And even after the revolution, he still thought his theses risky enough to confess his authorship of the *Treatises* only in his will of 1704.

While the *Essay* earned Locke a reputation as one of Europe's great philosophers within a surprisingly short span of time, the *Second Treatise on Government*

was seen as a manifesto of one of the radicals, containing arguments which defended the Parliament as the legislative body, 'the essence and union of the society' (Ashcraft 1986, p. 546), against the attacks from James II. Its publication after the victorious revolution made it possible to interpret it as a justification of dynastic change:

... to establish the Throne of our Great Restorer, Our present King William; to make good his Title, in the Consent of the People, which being the only one of all lawful Governments, he has more fully and clearly than any Prince in the Christendom: And to justifie to the World, the People of England, whose love of their Just and Natural Rights, with their Resolution to preserve them, saved the Nation when it was on the very brink of Slavery and Ruin.

(Locke 1964, p. 155)

Next to Locke the epistemologist and the political philosopher, Locke the economist appears almost invisible – so much so that major monographs on his work and life hardly consider our text worth mentioning. True, its external form is that of an economic pamphlet, written in a language, as Locke himself tells us, less carefully designed than that of his other works. There are repetitions and unresolved contradictions (or, at least, obscurities) which betray that the author served the purpose dictated by the moment of composition, not knowing that he was actually writing a classic text.

II.

Locke had a comprehensive historical influence. He undermined absolutism by introducing the separation of powers, thus preparing the way for the American declaration of independence. It was said of Jefferson that he plagiarised Locke, of Rousseau that he moved 'within the space demarcated by the *Treatises*' (Specht 1989, p. 185). The combination of Locke's political philosophy, based on natural law, with the labour theory of value moved the latter beyond the confines of a political arithmetic where Petty had already established a place for it.

Petty, in his applied economic theory, had thought it useful to employ a thought experiment in which one man produces grain for a year, and another produces silver for a year. If these two men are at the same time capable of producing what is required for their subsistence, the product of their labour must have the same value. If the labour required for providing their subsistence takes up the same amount of time, it follows that the amount of grain and silver produced must have the same value because they also required the same amount of labour.³ (The example was chosen – if accidentally so, we don't know – in a way that made the calculation of interest irrelevant. Generally, such calculation forces you to leave a pure labour theory of value.) Thus, in Petty, recourse to labour value serves the purpose of calculating value and is an aspect of positive economics. By contrast, Locke's political philosophy modernises the Medieval and Roman legal tradition of using the work exerted on an object as a justification for

the ownership of the changes thus effected. An object is the property of the producer to the extent that he independently produced it. If he only modified it, as in the case of a Roman sculptor who made a statue out of bronze, he is entitled to a remuneration corresponding to the difference in price between the statue and the cost of the raw material, i.e. the bronze. It seems to be this normative idea which is given a new meaning by Locke when he takes an imagined state of nature as his point of departure. From there on, classical economics will combine the two perspectives of Petty and Locke.

Locke derives the right to private property from the right to self-preservation.⁴ In the state of nature, man acquires the fruit he collects, as well as the produce of the soil he cultivates through labour. Where he cultivates the soil, the soil itself becomes his property. However, there is a limit set to property rights, insofar as the labourer must not violate the 'common Law of Nature' and let the products of his labour go to waste. In particular, no one has a right to land which he only encloses without cultivating it (Locke 1964, §§ 37–8, pp. 312–14). Locke's illustrations are not just taken from the Old Testament, but predominantly make reference to America, making his argument another example of the justification of the seizure of land by colonialists on the basis that they make better use of the land than the native inhabitants.

It is labour, and not only directly exerted labour but also indirect labour, which justifies property rights. The labour theory of value, however, is only considered under its qualitative aspect, so to speak. Labour establishes property, but there is no claim to the effect that relative prices should correspond to relative labour time. The latter corresponds to the quantitative aspect of the labour theory of value, which is introduced by Petty.

Locke's position is expressed in the following passage:

An Acre of Land that bears here Twenty Bushels of Wheat, and another in *America*, which, with the same Husbandry, would do the like are . . . of the same natural, intrinsic Value. But yet the Benefit Mankind receives from the one, in a Year, is worth 5 l. and from the other possibly not worth a Penny, if all the Profit an *Indian* received from it were to be valued, and sold here . . . 'Tis labour then which *puts the greatest part of Value upon Land* . . . : 'tis to that we owe the greatest part of all its useful Products . . . For 'tis not barely the Plough-man's Pains, the Reaper's and the Thresher's Toil, and the Bakers Sweat, (that) is to be counted into the *Bread* we eat; the labour of those who broke the Oxen, who digged and wrought the Iron and Stones, who felled and framed the Timber employed about the Plough, Mill, Oven, or any other Utensils, which are a vast Number, requisite to this Corn, from its being seed to be sown to its being made Bread, must all be *charged on* the account of *Labour* . . . : Nature and the Earth furnished only the almost worthless Materials, as in themselves.

(*Ibid.*, § 43, p. 316)

Locke hardly touches upon the typical problems of such a qualitative labour theory of value. How is the transfer of property, especially inheritance, to be

regulated? And how does the property right to the products of an employee come about? Which limits to property rights result, if contractual work is permitted? Because Locke departs from a fictional state of nature but nevertheless illustrates it with historically specific examples, especially from America, he would also have to accept questions regarding other historical cases of dependent labour, such as slavery.

The introduction of money transcends the original limits of appropriation because money can be accumulated. The justification of the emerging inequality is given by pointing to the observably higher productivity of labour. The native inhabitants of America possess land in abundance:

... yet for want of improving it by labour, have not one hundredth part of the Conveniencies we enjoy: And a King of a large and fruitful Territory there feeds, lodges, and is clad worse, than a day Labourer in *England*.

(*Ibid.*, § 41, p. 315)

If Locke had looked at changes in ownership from the perspective of exchange, this would have led him to move from the qualitative to the quantitative aspect of the labour theory of value.⁵ Someone exchanging a product that required little labour for another one that required a substantial amount of it owes part of his property to someone else's labour. The further path from Locke leads either to the theory of exploitation or to a modification of the theory of ownership. In Ricardo, exchange value is modified by the rate of profit, and the gain is justified with the accumulation of capital. In Neoclassical Theory, further elementary factors play a role alongside labour. In his essays that are interested in solving problems of economic policy, Locke uses an explanation of relative prices based on supply and demand without giving a fully developed theory of it.

III.

The polemic against a maximum interest rate set by the state as presented in *Some Considerations* is of significance beyond its immediate purpose, due to the theoretical discoveries which it contains. To begin with, Locke takes the old arguments for legislation against usury – the Scholastic tradition of protection, if you like – and turns them upside-down. The lowering of interest disadvantages needy creditors, such as widows and orphans, who live off income from interest, while being advantageous especially to financiers, because bankers are most likely to find ways around the limits set to interest (for instance, in the context of foreign exchange). Thus, the legislation aiming at raising the level of morality misses its aim, as it actually promotes dishonesty by disallowing what cannot be prohibited.

Next, Locke develops the notion of a natural rate of interest ('natural use') at which the supply of credit equals the demand for it.⁶ If this 'natural use' is close to the 'legal use', there is less need for banks to do their work.⁷ If the natural rate of interest exceeds the legal interest, different economic groups are affected in

different ways. The careful differentiation between these groups is one of Locke's achievements. His assumption is that a high natural rate of interest results when debtors are asked to redeem their credit in times of unfavourable trading conditions or when there are only insufficient amounts of money in circulation. An artificial lowering of interest rates results in losses for creditors (those widows and orphans), yet does not bear any advantages for the trade of the Kingdom. The profit of the merchant debtor who borrows money, say, at 4 per cent, but has a profit rate of, say, 12 per cent, may increase; however, this advantage must be offset against the shortage of available credit, which, in modern terms, leads to its rationing. As a consequence, trade is impeded and the country suffers because less export can be financed.

Locke is thinking along Mercantilist lines. The precious metal on which the circulation of money is based can be acquired only through a surplus in trade, and – in his view – it cannot be substituted with bills of exchange to any significant degree. Locke does not discuss the problem which arises from the fact that not all countries can achieve a surplus in trade at the same time. However, he is obviously right in emphasising that trade crucially depends on profit rates exceeding interest rates.

One of Locke's substantial contributions to economic theory is the way in which he supplements his quantitative reflections (the 'intrinsic value' of gold and silver depends solely on their 'quantity') with an analysis of the 'quickness of circulation'.⁸ In order to determine the 'proportion of money to trade', Locke, with a clearness that is striking to the modern reader, establishes the necessary volume of money needed by labourers, landholders, and merchants, based on the fact that labourers are paid weekly, tenants and landowners render their accounts quarterly, and merchants need to have around 5 per cent of their annual income available throughout the year. No less than '... One Fiftieth part of the Labourers Wages, One Fourth part of the Landholders yearly Revenue, and one Twentieth part of the Brokers yearly Returns in ready Money ... (Locke 1991, p. 240)' are needed in order to finance the country's trade.

Thus, the value of money is determined in terms of its purchasing power, which, in turn, is derived from its quantity and speed of circulation. Interest is not the price of money:

The fall therefore or rise of *Interest*, making immediately by its change neither more nor less Land, Money, or any sort of Commodity in England, than there was before, alters not at all the Value of Money, in reference to Commodities. Because the measure of that is only the Quantity ... which are not immediately chang'd by the Change of Interest.

(Ibid., pp. 245–6)

Changes in the interest rate therefore only indirectly influence the price of money through their effect on the volume of trade. But if so, why is there such a thing as interest at all? 'Money is [a] barren thing, and produces nothing, but by Compact transfers that Profit that was the Reward of one Man's Labour into another Man's Pocket' (ibid., p. 250).

Thus, wholly in line with the theory of supply and demand, it is the uneven distribution of money, together with uneven investment opportunities, which gives rise to the phenomenon of interest. Locke's theory of natural law, according to which property is based on labour, leads him close to the idea of exploitation, but in a somewhat ambiguous formulation he declares that if someone receives 6 per cent interest, '... his Six *per Cent*, may seem to be the Fruit of another Man's Labour, yet he shares not near so much of the profit of another Man's labour, as he that lets Land to a Tenant' (ibid., p. 251).

With this, Locke remains firmly within the old tradition of understanding any voluntarily entered credit relationship as analogous to tenancy relations. In the times of the Old Testament, someone who gave away a herd of animals on loan was entitled to lay claim to the offspring produced during the time of the loan. In that sense, the loan of a herd was analogous to the loan of arable land. In both cases, the creditor remained the owner of what was on loan and received a part of its yield. According to the modern understanding, by contrast, a credit agreement is an intertemporal exchange, in which the creditor gives away his money in exchange for a promise to receive another sum of money, one with a larger value.

Following an excursus on how to explain the price of land on the basis of the capitalisation of rent and the various influences of economic conditions, as well as the taxation of land prices, Locke returns to the question of the lowering of interest. If it occurs through market mechanisms, it is, of course, advantageous! One must not confuse the measure taken by the Dutch, who adapted their national debt to the lower interest rates on the market by way of a skilful conversion, with the legal fixation of a lower maximum interest rate.

Finally, Locke comes to the crux of the matter and connects the analysis of economic interests with his theory of money. The politically powerful landowners want to lower the interest because they are indebted and hope that they will be able to increase the value of land. They conceive of the latter as determined by capitalised rent, i.e. interest (an idea which Locke meets with some doubt). However, their intervention upsets the whole working of the economy and, in particular, leads to a lowering of rents, with the result that the situation of especially the landowners worsens, rather than improves:

The usual struggle and contest, as I said before, in the decays of Wealth and Riches, is between the *Landed Man* and the *Merchant*, with whom I may here join the *Monied Man*. The *Landed Man* finds himself aggrieved, by the falling of his Rents, and the streightning of his Fortune; whilst the *Monied Man* keeps up his Gain, and the *Merchant* thrives and grows rich by Trade. These he thinks steal his Income into their Pockets, build their Fortunes upon his Ruin, and Ingross more of the Riches of the Nation than comes to their share. He therefore endeavours, by Laws, to keep up the value of *Lands*, which he suspects lessened by the others excess of Profit: But all in vain. The cause is mistaken, and the remedy too. 'Tis not the *Merchants* nor *Monied Man's* Gains that makes Land fall: But the want of Money and lessening of our

Treasure wasted by extravagant Expences, and a mis-manag'd Trade, which the Land always first feels.

(Ibid., p. 291)

Thus, the pamphlet ultimately is a call to sort out the state finances and to create the right conditions for the flourishing of the private economy. This approach, like Locke's suggestions for a reform of the mint, appears liberal in spirit and makes one hesitate to call him a Mercantilist. Terence Hutchison pointed out that Locke the civil servant, more so than Locke the author, acted according to the principles of Mercantilism, for instance when he suggested to repress the Irish wool trade in favour of the English and in his projects aiming to reduce begging.⁹ At the end of the day, this philosopher, who was as conciliatory in his writing as he was combative in his political actions, was altogether a child of his times: notwithstanding all theological speculation, he was a representative of the Enlightenment bourgeoisie and its faith in the fundamental rights of political freedom, religious tolerance, and private property.¹⁰

The Pamphlets from 1815: a shining moment for economic theory

In the history of economic thought, there is little in the twentieth century equal in importance to the publication of *The Works and Correspondence of David Ricardo*, edited by Piero Sraffa. The edition is a masterpiece: well-produced and well-presented volumes, a balanced critical apparatus, and an abundance of previously unpublished texts of great importance: together, these lend Ricardo's work a renewed topicality. For economists, this was an event equivalent to that experienced by lovers of literature, as if, more than a hundred years after Goethe's death, they first had held in their hands a critical collected edition which also contained the first publication of *Faust II* and *Divan*. Sraffa's search for unpublished manuscripts led to the discovery of the famous tin box, which contained such important late texts as *Absolute Value and Exchangeable Value* and numerous manuscript letters. A more rigorous and consistent Ricardo emerges from this new edition. Sraffa's spare introductions to the individual volumes, modestly presented as an outline of textual history, provide the key to interpretation. Among the honours which the editor received for this work was the Prize of the Swedish Academy of Science, and he was elected to the Accademia dei Lincei at the suggestion of Einaudi, President of the Italian Republic.¹¹

At first, this publication seemed only to be a classic case of overenthusiasm on the part of historians of economic thought. Then it became clear that Sraffa's introduction to the first volume offers an interpretation of the Ricardian system which turns out to be one of the most significant contributions to growth theory, distribution theory, and value theory since the Second World War. This influence is most visible in subsequent works by Joan Robinson and Nicholas Kaldor but reaches far beyond these.¹² In short, Sraffa reconstructs Ricardo's path from a theory of growth and distribution, whose essential features were

in place by 1814 at the latest, to the theory of the connection of values, prices, and the distribution of income. These had developed in continuing work on the ideas in *An Essay on the Influence of a Low Corn Price on the Profits of Stock*, from 1815, and which he published in 1817 as the *Principles*. The newly discovered, previously unpublished essays demonstrate that Ricardo did not waver in his conceptions but constructed them ever more rigorously and consistently, so that the three editions of the *Principles* (published in 1817, 1819, and 1821) can be understood as a unit, a perspective differing from the way in which they were viewed during the nineteenth century. The one exception to this is the concession to the possibility of unemployment resulting from technology, which appeared only in the final edition.

In this development, so momentous for the history of theory, the *Essay on the Influence of a Low Price of Corn on the Profits of Stock* assumes the key position. Superficially, it is a printed booklet which was distributed as a pamphlet, one could even say as a polemical pamphlet. It was only one of many pamphlets publicly available to middle-class men interested in politics before and during the parliamentary debate on corn duties. After the end of the Napoleonic Wars, protection could have been lifted. The amount of cultivated land, expanded because of the closing-off of Continental markets, would then have shrunk again, but agrarian protectionism safeguarded the income of landowners. At the same time, landowners increased wages and hindered industrialization, so that a conflict arose between agricultural interests and manufacturing interests, experienced by other countries at other times (if, in part, for other reasons) – for example, the German empire toward the end of the nineteenth century. Whereas attempts to influence the political process often enough settled for superficial arguments, this debate on the Corn Laws promoted the publication of essays which enriched economic theory with many new insights or, to some extent, arguments which were for the first time effectively disseminated. Rent theory, the law of returns and advances of the theory of foreign trade, can be connected with the year 1815.

Alongside Ricardo there was Malthus, who was also one of the most important figures in economics; Torrens, who made important and influential contributions to economics in the nineteenth century; and West, who was also a noteworthy representative of the discipline. They were colourful personalities. Their contributions to rent theory and the law of returns are, in the 1815 pamphlets, to be considered more as individual discoveries which – at least with regard to Malthus and Torrens – play only a secondary role in the complete works of each person. Thus, few remarks can be found on the thoughts expressed in the present pamphlets in the four-volume collected works *Thomas Robert Malthus: Critical Assessments* (Malthus 1994), because it is Malthus as a population theorist who receives all of the attention. Torrens, who is no less multifaceted, is similarly not particularly remembered for his book from 1815. The development of Ricardo's theory would, by contrast, dominate the field for the first two-thirds of the nineteenth century; his pamphlet represents one of the most important steps taken in the development of economic theory, and the other pamphlets also primarily derive their importance from that: as inspirations for rent theory and as interesting rivals.

Sraffa's interpretation of Ricardo has not gone undisputed. Among his reconstructions is Ricardo's so-called corn model. This is an abstract model of an economy, in which corn is produced from seed corn and real wages are paid in corn. Ricardo never explicitly formulated these assumptions in the surviving texts; Sraffa deduced them from the correspondence. If the deduction is accepted, then corn is produced with corn and labour. At the end of each period, a specific amount of corn is available for distribution to the landowner and the entrepreneur, the productivity of corn production and the level of the real wage being a given determined by the subsistence level of the worker. If now, based on the amount of available corn capital, a particular number of pieces of land are to be cultivated, the best land will be taken into cultivation first, moving on to successively inferior land, so that the final piece of land cultivated will only be partially used. This last piece of land will yield no rent. The difference between the costs of cultivation on better and the final piece of land is taken by the landowner as rent. The profit on this final piece of land governs the profit rate. In the course of economic growth in a closed economy, ever more inferior land has to be taken into cultivation, so the profit rate falls. This is the basic idea. When Ricardo first thought of the declining rate of profit, he was not familiar with the idea of differential rent. At first, the law of return, linked to a conception of returns and expenditure as homogeneous magnitudes measured in corn, was sufficient.

Samuel Hollander cast doubt on the existence of Ricardo's corn model (Garegnani 1982). A debate followed which indirectly concerned the foundation of the Ricardian system. It turned out that the corn model was repeatedly used by economists in Ricardo's circle (Vivo 1985). Michalis Skourtos (1991), who has also worked in the Ricardian tradition, has discovered other corn models used by economists contemporary with Ricardo. He shows that the basic structure of the corn model can be found in a number of authors, but that the model in Ricardo's hands was more precisely thought through, and that his use of it was of far greater consequence than that of other writers. Samuel Hollander then summarizes the results of the debate from the opposing point of view. In this way, readers are given the opportunity to form their own opinions. I would like here to make some remarks about the differing views of the pamphlets' authors, but I begin by recapitulating Sraffa's interpretation, since recent commentary begins from this.

Ricardo's *On the Principles of Political Economy and Taxation* was originally conceived as no more than an expanded edition of *An Essay on the Influence of a Low Price of Corn on the Profits of Stock*. James Mill assumed the role of taskmaster and kept on at Ricardo to work out his theses on distribution theory, resulting in their publication in book form as a critique of the conclusions of Adam Smith and Malthus. The *Essay* was published in February 1815, but a year later Ricardo was stalled by the problem of how to transform the basic ideas of distribution theory developed in the *Essay* to a multi-sector economy by extending his theory of value.

The problem he encountered concerned the famous 'curious effect,' according to which an increase in wages leads to a decrease in the prices of goods

primarily produced with the aid of machines and fixed capital (Sraffa 1966a, p. XVI). Ricardo was faced with the difficulty that, as commonly understood, wage increases could be passed on as price increases, so that an increase in wages would bring about a general increase in prices. But if the price level has a fixed connection to the gold standard, an increase in wages cannot be passed on in the long run; if the level of productivity is given, the anticipated wage increase can be realized only at the cost of profit. Here Ricardo had to diverge from Adam Smith's conception of price and distribution. For Smith, the natural price is made up of the distributive components (wages, profits, and rents); it was possible for one component to increase without influencing the others. For Ricardo, it was clear that the surplus of production over technical production costs was a given and available for distribution between wages and profits (or, expanded, between wages, profits, and rents). Taking account of the price level as a whole, if wages increased and profits fell, one had to consider how the profit rate might remain constant in the long run. The expected wage increase would primarily have to affect industries which employed a large amount of labour relative to capital. Since the profit rate fell as a result of the wage increase, prices had to be raised in these industries, so that profits remained in conformity with a general rate. Thus, with average price levels constant, prices fell in other industries which employed relatively little labour and a great deal of capital, so that wage increases were there overcompensated for by the effect of the fall in the profit rate on the price of the product.

This is the key to Ricardo's value doctrine, as developed step by step in *Principles*. The question is how Ricardo could comprehend it, since he does not then use, as we have here, the vague term of a 'general price level'. Ricardo wanted to examine changes in distribution. He concluded that changes in distribution had an influence on relative prices, thus on the calculation of what was to be distributed. How, under these conditions, could the law of the relationship between growth and distribution be formulated?

We cannot here deal with Ricardo's attempt at solving this problem by using a modified labour theory of value. It is enough to say that for him, relative prices were determined by labour value but were modified by the capital:labour ratio, which varies over different industries. Ricardo principally measured the differences using production periods – the time which passes until a product 'is brought to the market'. For an average or standard product, production costs could be measured by the labour input. Those with an above-average labour content must increase in price relative to this when wages rise, and those with an above-average proportion of capital (with a long journey to market) must, in contrast, fall in price.

It has always been a puzzle that the influence of the composition of capital on value appears in Ricardo only as a modification of its determination by labour value and not as an independent and equal principle. Before Sraffa, it was often assumed that the third edition of *Principles* showed a weakening of the primacy of price determination through labour value. After Sraffa's publication of Ricardo's works, Lionel Robbins (1958, p. 61) wrote,

The idea that value should be regarded as determined not by labour only but also by the rate of profit for the time that the capital remained invested is so obviously a logical step to a more tenable position that, although in the rewriting of the third edition he [Ricardo – BS] seems to have decided not to take it, I should be inclined to regard it as something that was continually suggesting itself to his mind.

I would have thought that a sufficient reason for Ricardo's insistence on the primacy of the theoretical labour value determination was simply this: he was primarily interested in precise quantitative determination. If he had placed any kind of measure of capital costs symmetrically alongside the measure of labour costs, this would have introduced a principle of imputation symmetrical for both factors. However, his conceptual apparatus did not allow for a more accurate calculation of the prevailing long-run costs. Only by directly going back to the representation of the structure of production through the physical input of goods and labour can prices be precisely calculated today, as we have known more exactly since Sraffa's *Production of Commodities by Means of Commodities* (1960). The mathematical knowledge necessary for this was not available to Ricardo. We will soon see how his friend Torrens came closer to the idea of the reduction of prices to the structure of inputs, but he, too, lacked the knowledge to formally follow through with this.

For the moment, however, we are not so much interested in the later reshaping of Ricardo's theoretical structure, but rather in its foundation. That he could so keenly understand the idea of a given surplus available for distribution in every period was apparently due to the continuation of discussion of the corn model. For here, profit on the last piece of cultivated land appeared as a physical amount of corn with labour and seed costs subtracted; this can be directly related to corn as capital investment, so that the profit rate can be calculated as the relationship between two physical quantities without the intervention of prices. This profit rate must therefore also apply to other sectors of the economy, which, in exchange with capitalists and landowners, deliver luxury goods in return for corn, but which can represent no direct input for the agriculture. Thus, the general profit rate can be deduced from the corn profit rate, without the calculation of prices. This explains the assertion, made in the *Essay*, that profits in agriculture regulate profits in all other branches of production – an assertion which does not appear again in *Principles*, because there agriculture also purchases means of production from industry, so that a more complex theory of the rate of profit, including prices, is necessary.

In the *Essay* the assumptions of the corn model are not explicitly specified – perhaps simply because such a highly theoretical abstraction would have hindered the political purpose of the pamphlet. Sraffa (1966a, pp. XXXI–XXXII) writes about this in his introduction:

Although this argument is never stated by Ricardo in any of his extant letters and papers, he must have formulated it either in his lost 'Papers on the

Profits of Capital' of March 1814 or in conversation, since Malthus opposes him in the following terms which are no doubt an echo of Ricardo's own formulations:

In no case of production, is the produce exactly of the same nature as the capital advanced. Consequently we can never properly refer to a material rate of produce. . . . It is not the particular profits or rate of produce upon the land which determines the general profits of stock and the interest of money.

The nearest that Ricardo comes to an explicit statement on these lines is in a striking passage in a letter of June 1814: 'The rate of profits and of interest must depend on the proportion of production to the consumption necessary to such production.' The numerical examples in the *Essay* reflect this approach.

Malthus also criticizes Ricardo for failing to include in his table the 'tea, sugar, clothing, etc.' which go into the consumption of labour (*ibid.*, p. XXXII, FN).

'*Se non è vero, è bene trovato*' [If it is not true, it is well conceived]: any theorist who presents the corn model in first-year student lectures may like to cite this Italian saying. For the historian of economic thought, this will not do; we are interested in the pamphlets of 1815 because we want to become more familiar with the development and importance of Ricardian theory. According to Sraffa, Ricardo and Malthus began at the latest in August 1813 to turn from monetary theory to distribution. In a letter from early 1814, Ricardo already mentions that in a closed economy without technical progress, a fall in the profit rate must follow when growth forces the cultivation on to poorer soil. The statement ' . . . in short it is the profits of the farmer which regulate the profits of all other trades' (Sraffa 1966b, p. 4) contains the foundation of his distribution theory, although it was later modified.

When the pamphlets by Malthus, West, and Torrens appeared, Ricardo could connect their newly developed theory of rent with the law of diminishing returns; the connection of both elements resulting in the corn model, which appears in historically oriented textbooks. Ricardo later claimed that he was unaware of West's rent theory while writing his *Essay*; he explained that he was instead in debt to Malthus for the development of the theory of rent.¹³ West's essay appears to have been written independently of the others. Seligman (1903, p. 512) mentions a rarely cited John Rooke, who also discussed rent theory in numerous essays in the years 1814 and 1815. James Anderson, who at the time of Adam Smith wrote on differential rent, is most commonly listed as a predecessor for all of these. Because of his evolutionary perspective, however, he differs from the later Ricardian School: the fertility of land changes over time through cultivation (Gee 1987, p. 93). For Anderson, rent is a 'medium by means of which the expense of cultivating soils of very differing degrees of fertility may be reduced to a perfect equality' (Plummer 1929, p. 575), i.e. the profit rate will be equalized. In addition, Anderson distinguishes different classes of land.

Ricardo's text stands out due to its emphasis on contradictions, which intensify following the falling rate of profit, as progressively worse soils are taken into cultivation under the condition of growth without improvements in productivity:

It follows then, that the interest of the landlord is always opposed to the interest of every other class in the community. His situation is never so prosperous, as when food is scarce and dear: whereas, all other persons are greatly benefited by procuring food cheap.

(Ricardo 1966, p. 21)

As a liberal, Ricardo does not criticize this state of affairs if a result of the “natural course of things” (ibid.), but he certainly does so if it develops from artificial restrictions on imports. Aimed at Malthus, he writes several pages later:

In his last publication, however, in one part of it, he dwells with much stress on the losses of agricultural capital, which the country would sustain, by allowing an unrestricted importation. He laments the loss of that which by the course of events has become of no use to us, and by the employment of which we actually lose. We might just as fairly have been told, when the steam engine, or Mr. Arkwright’s cotton-machine, was brought to perfection, that it would be wrong to adopt the use of them, because the value of the old clumsy machinery would be lost to us. That the farmers of the poorer lands would be losers, there can be no doubt, but the public would gain many times the amount of their losses; and, after the exchange of capital from land to manufactures had been effected, the farmers themselves, as well as every other class of the community, except the landholders, would very considerably increase their profits.

(Ibid., p. 33)

Ricardo would probably have even taken this position, if – in contrast to the picture of England that he outlines – the farmers had themselves worked their own land as landowners. Independent farmers, who bear the brunt of the reduction in agricultural prices, are affected by disadvantages which in Ricardo are distributed among three classes, but which here affect one and the same family. In Ricardo, the fall in profits is borne by farmers who are considered to be mobile, by the loss of employment on the part of day labourers, and a loss in income on the part of landowners. The intrinsic value of rural culture and the protection of the countryside – arguments which play a role in modern discussions of agriculture – receive no attention from Ricardo: his focus is on economic growth. Malthus, the advocate of protection, has other motives.

Although there is now a very extensive secondary literature on Malthus, James Bonar’s (1966) book appears to me to be still worth reading. Malthus’s 1815 pamphlet seems less elegantly argued than Ricardo’s, but it throws light on many interesting questions relevant to theory and policy. Thus, we find in *Inquiry* a polemic against Smith’s rent theory, differential rent theory is introduced and extended to include an application to machinery, developmental differences in industry are put in relation to the agricultural situation, and Malthus frequently returns to his law of population.

Ground of an Opinion is reminiscent of the vicissitudes of the Napoleonic Wars and the unexpected peace, which brought to an end the expansion of

agricultural production that the war fostered. Malthus considered the resulting rural poverty to be more serious than the outcome of industrial crises for urban workers. Corn from France, considering its better climate, would have been cheaper than English corn. But who could guarantee that England might not once again be cut off from this supply as it had been under Napoleon – and most likely in years of bad harvests? These arguments, which no doubt impressed Malthus's contemporaries, are then followed by consideration of the increasing pressure of government debt and also falling prices, resulting from the opening up of trade. Certainly, Malthus goes on, it is not the duty of the government to guarantee a particular income for a single class of the population; however, it is their duty to ensure an independent supply. In the face of this intricate, recurring theme of protection, the radical nature of Ricardo's liberal position – radical in its scientific derivation and in the assumption of political preconditions and possibilities – first becomes fully clear.

Edward West is the only one of the pamphlet authors who is primarily remembered by economists for his contribution to the 1815 debate. Born on 1 March 1782, West studied at Oxford, received his master of arts in 1807, and remained a fellow of University College until 1823. From 1814, he also worked as a lawyer. He had extraordinary abilities, great energy and courage. In 1823, he was a British judge in India. For half a century, there had been efforts to replace the old, arbitrary rule of the East India Company with a regular colonial administration. There were still abuses. For example, natives were sent to the judge with a note in hand: 'The bearer of this note is to be whipped.' From his wife's diary, we learn that he was admired by the Indian people and respected by the government; he made great efforts to introduce an organized system of legal protection. He died in 1828, before the expiration of his seven-year term. His early death was not unusual; this was quite a frequent, even typical, fate for colonial officials (Plummer 1929, pp. 573–82). Apart from his *Essay* of 1815, West published a second economic book, *Price of Corn and Wages of Labour, with Observations upon Dr. Smith's, Mr. Ricardo's and Mr. Malthus's Doctrines upon these Subjects; and an Attempt at an Exposition of the Causes of the Fluctuation of the Price of Corn During the Last Thirty Years* (cited in Grampp 1970, p. 317).¹⁴ It is said of this book that it was little read. Grampp comments that

That is a pity; had it been, economics could have taken a different course in the nineteenth century and have attained its present position much sooner. West would then be remembered for many more ideas than the idea of diminishing returns.

(Ibid., pp. 319–20)

In his *Essay*, West sought to explain the decline of the rate of profit. He ascribed it to declining returns in agriculture. He explains rent correctly and as Ricardo does, but the *Essay* contains the assertion that rent falls when capital is accumulated in agriculture, while Ricardo had drawn the opposite conclusion. And West did not stop there; he thought his conclusion explained the grievance on the part

of the landowners that the share of the rent in the total product had sunk. He sought to work out the reciprocal effects of technical progress, which increased productivity in agriculture, and a law of returns, which pointed to diminishing returns as increasingly poorer soil was taken into production:

The division of labour and application of machinery render labour more and more productive in manufactures, in the progress of improvement; the same causes *tend* also to make labour more and more productive in agriculture in the progress of improvement. But another cause, namely, the necessity of having recourse to land inferior to that already in tillage, or of cultivating the same land more expensively, *tends* to make labour in agriculture less productive in the progress of improvement. And the latter cause more than counteracts the effects of machinery and the division of labour in agriculture . . .

(West 1815, p. 25)

In his polemic against Adam Smith, the real point is ‘. . . the fact that the ratio of rent to the gross produce diminishes’ (ibid., p. 30).

This effect should also have been traced back to the increased taxation of landowners, according to Grampp (1970, p. 322), but West draws the surprising conclusion that it is advantageous for landowners to leave marginal land fallow, as was to be expected from a reduction in corn duties. It is no surprise that West’s pamphlet was better received among landowners than Ricardo’s.

A decrease in differential rent cannot be logically ruled out if the productivity of marginal soils increases more quickly than that of the better soils, but then wages and/or profits increase as well. West (1815, p. 51) continues, elaborating the Ricardian approach by using a table, and finally he shows that corn prices and rents move in parallel, but in one example a price decrease of one-third in corn prices reduces rents only by about one-fifth. The conclusions drawn from an approach that allows for various tendencies remain very cautious and could certainly be interpreted in favour of the moderation of protection.

Declining returns over a *period* of time seem for Ricardo to be a sensible empirical generalization, not just a hypothesis introduced to generate discussion. The claim that the hypothesis of diminishing returns was empirically valid was logically equivalent to the supposition that the diminishing returns that could logically be anticipated at every *point* in time would not in the long-run be fully compensated, or even overcompensated, because of technical progress. At the same time, however, Ricardo places the logic of the argument – particularly in the *Principles* – so completely in the foreground that his theory survived, even when the facts developed differently than expected, and agricultural returns as a whole increased over time on the same land, thanks to mechanization, fertilization, and other improvements to cultivation. West remained more strongly attached to the empirical side of the argument and was forgotten sooner (Grampp 1970, p. 323). In addition, in West’s pamphlet Grampp sees the anticipation of Heckscher’s and Ohlin’s principle that foreign trade with diminishing returns leads to the

equalization of marginal costs and discovers a number of noteworthy statements in West's later book which he believes can be combined into a system.

Torrens was less well-known than Ricardo or Malthus but far better-known than West. In the course of his long life, Torrens (1780–1864) published in nearly all areas of economics for half a century. He was a newspaper owner, for a time a member of Parliament, and a co-founder of the Political Economy Club; he wrote novels; and he was a soldier. The literature of the Ricardo era generally refers to him as *Colonel Torrens*. This title was no empty gesture of respect. Torrens, who joined the Royal Marines in 1796, had already published a number of economics texts before 1815. He was thus not kept inordinately busy by his military service, but he was a celebrated hero when in the war with Denmark, as commander of an island fortification, Anholt, he successfully repulsed a Danish attacking force of 2,000 men with only 300 marines. It was not the only military adventure in which he proved his courage (Fetter 1962), and he conducted himself confidently in Parliament as well (Meenai 1956). In the 1840s he was considered an important representative of the Currency School, a supporter of the Bank Acts sponsored by Overstone and Peel, although in his younger years he made statements more inclined to the Banking School (O'Brien 1965). Robbins (1958) was able to present the entire development of Classical economics through his account of Torrens's life work.

Torrens's pamphlet shows him to be an independent spirit, and the pamphlet has its own perspective, given the common issue with which all of the 1815 pamphlets were concerned. In place of West's conscious reserve, we here encounter well-founded and decisively presented arguments. The Ricardian connection of capital accumulation to the tendency of the rate of profit to fall is supported here with historical precedents: England should not, like those states with a large land mass, make agriculture its primary focus but should follow the example of early modern city-states, which became important through manufacturing exports and corn imports (Torrens 1815, p. 330). Free trade and protection ultimately become a financial choice, involving a '... comparison between flourishing revenue and bankruptcy' (ibid., p. 340). He follows this argument with suggestions for the gradual transition to free trade.

Here I will explore a few striking ideas which Torrens developed in his 1821 book (Torrens 1965 [1921]), since it represents an attempt to expand the corn model to more sectors (Schefold 1986, pp. 212–15).

The Classical economists – and not they alone – agreed that prices must in the long term correspond to production costs (including normal profits). Torrens expressed it as follows:

Effectual demand and supply are in the relation of equality when the ingredients of capital offered in exchange for commodities exceed, by the customary rate of profit, the ingredients of capital expended in producing them. . . . Thus, assuming the rate of profit to be ten per cent, the supply of silks will equal the effectual demand, when, for every portion of this article brought to market with the expenditure of one hundred days' subsistence, one hundred and ten days' subsistence, or one hundred days' subsistence with other things

equivalent to ten days' subsistence, is produced in some other quarter, and brought to market to be exchanged, directly or circuitously, for silk.

(Torrens 1965 [1821], pp. 360–1)

The question was how these costs could be more precisely determined. In regard to Torrens, there is talk of a 'Capital theory of value' (Robbins 1958, ch. 3), but how is capital to be measured? Torrens, at least in part, resorted to the structure of production:

Let us suppose that there exists a society of one hundred cultivators, and one hundred manufacturers, and that the one hundred cultivators expend one hundred quarters of corn and one hundred suits of clothing, in raising two hundred and twenty quarters of corn, while the one hundred manufacturers expend one hundred quarters of corn and one hundred suits of clothing, in preparing two hundred and twenty suits.

(Torrens 1965 [1821], pp. 372–3)

Torrens thus outlines the following formula:

$$100 \text{ corn} + 100 \text{ clothing} \rightarrow 220 \text{ corn}$$

$$100 \text{ corn} + 100 \text{ clothing} \rightarrow 220 \text{ clothing}$$

The amounts of corn and clothing used in production naturally serve primarily the consumption of workers. These amounts increase by about 10 per cent. The 'class of cultivators' and the 'class of manufacturers' now have access to a '... surplus, or profit of ten per cent, they might employ either in setting additional labourers to work, or in purchasing luxuries for immediate enjoyment' (*ibid.*, p. 373).

In the first case, the growth rate of the system could amount to 10 per cent; it is less if part of the surplus is consumed. In the next part of the discussion, Torrens allows the rate of production to increase as a result of technical advances, so that an expanded surplus creates room for an increased demand for luxury items. In order to be able to satisfy this demand, however, the population must also grow. Under the specified conditions, the increased supply creates its own demand:

But this is exactly what is meant by effectual demand; and the more accurately we analyse the operations of industry and the transactions of the market, the more clearly we shall perceive, that while the due proportions are observed between the quantity of the ingredients of capital and of other things, increased production is the one and only cause of extended demand.

(*Ibid.*, p. 378)

Torrens further developed this model with some variations in order to track down some potential disruptions to reproduction. He also introduces money circulation

and observes how a possible overproduction in one sector can affect other sectors, the repercussions of a fall in prices and incomes spreading according to a multiplier mechanism. Therefore:

In all ordinary states of the market, prices will be determined by the proportion which exists between the quantity of the commodities to be circulated. . . . In periods of glut and general stagnation, however, prices are determined by other circumstances.

(Ibid., pp. 419–20)

We cannot follow the discussion any further here – it is also of interest in regard to economic policy; it shows how the abstraction which he builds is closely related to Ricardo’s corn model and anticipates the modern-day employment of models.¹⁵ Torrens’s idea can be formalized by:

$$(1 + R)\mathbf{A}\mathbf{p} = \mathbf{p}.$$

\mathbf{A} is an input-output matrix (which can be decomposed, because Torrens is speaking of luxury goods), \mathbf{p} is the vector of long-run prices, and R is the profit rate, determined by the given conditions of reproduction \mathbf{A} , which only depends on the basic system.

It is a fact both strange and in need of explanation that the corn model and its variants, clearly employed by the Ricardo School, could be so completely forgotten until its rediscovery by Sraffa. The reason(s) for this disappearance would make for an interesting study. Even Marx found himself confronted by it; he rejects any such approaches because the means of production are represented by natural entities and not in a form specific to the capitalist production process. It disturbed him that the physical surplus (corn for Ricardo, corn and clothes for Torrens) was not traced back to work performed and its exploitation. Furthermore, he points out that alongside the means of production and wages, the entrepreneur has to maintain a money reserve – an accurate remark, yet all the same it appears for many purposes that one can abstract from money in the elaboration of growth theory.

In *Theories of Surplus-Value*, Marx (1968 [1863]) draws on John Stuart Mill to present a system which reproduces itself in corn. The core of his argument amounts to proving, with the aid of the change in value of constant capital, that wage rates and profit rates do not always have to move inversely. We know, however, that such an inverse relation exists with a constant technology; it is expressed in the monotonically decreasing wage curve. Marx overlooked this point because in the change of value in constant capital, he deviated from the clear preconditions of the corn model, in which product and means of production are homogeneous; changes in value need not have been discussed at all.

In his discussion of Torrens’s book *An Essay on the Production of Wealth*, Marx’s discussion stops some pages before the interesting point where the reproduction model we discussed earlier can be found. Nevertheless, the increase of corn in corn production does occur here, and regarding this, Marx writes,

120 quarters of corn are most certainly more than 100 quarters . . . Regarded merely from the standpoint of use-value, these 20 quarters are not mere profit. The inorganic components have been merely assimilated by the organic components and transformed into organic material. Without the addition of matter—and this is the physiological expenditure—the 100 qrs. would never become 120. Thus it can in fact be said even from the point of view of mere use-value, that is, regarding corn as corn—what enters into corn in inorganic form, as *expenditure*, appears in *organic* form, as the actual result, the 20 quarters, i.e., as the surplus of the corn harvested over the corn sown.

(Ibid., p. 828)

Marx is entirely correct that the production process does not represent a *creatio ex nihilo*, and that it is only through additional expenditures that 100 quarters of corn can be transformed into 120 quarters of corn. With the phrase ‘physiological expenditure,’ he is thinking of the labour effort which underlies agricultural production. He does not forget, at the same time, that nature produces. To that extent, his criticism that the natural process and its particular economic form are not separate entities is perfectly correct.

However, neither Torrens with the reproduction model nor Ricardo with the corn model has the intention of specifying all of the materials used and produced, rather only those which are objects of economic processes, hence commodities. Understanding the economic process as a production of commodities by means of commodities, supported by labour and carried out on land of various levels of fertility, is therefore the basic idea of Ricardian economists. This was concealed by Marx because of his emphasis on the labour theory of value, until Sraffa rediscovered it. It is thus ridiculous when Marx continues:

But these considerations, in themselves, have as little to do with the question of profit, as if one were to say that lengths of wire which, in the production process, are stretched to a thousand times the length of the metal from which they are fabricated, yield a thousandfold *profit* since their length has been increased a thousandfold.

(Ibid., pp. 828–29)

If 110kg of corn can be made from 100kg of corn, including the necessary consumption of the workers, the surplus of 10kg to be distributed can be determined by subtracting and measuring the expenditure; the corn and the corn price remain the same. The wire drawn out of the metal bar is, in contrast, homogeneous with the bar only as metal, not as an economic commodity. Therefore, the relationship of the price of the wire to the price of the bar is different from the relationship of the price of the wire to its length or weight.

Even Marx, therefore, no longer properly understood the basic idea of the corn model. Only with Sraffa’s editions of Ricardo’s works is the terminology once again available. The publication of the 1815 pamphlets on rent might inspire a reconsideration of considerable importance for the history of economic thought.

Sismondi's *Nouveaux Principes d'Economie Politique*: classical liberalism, philanthropy, and the experience of history

I.

Sismondi's *Nouveaux principes d'économie politique* is among the best-known works of political economy, yet it is rarely read. There is a significant but divergent body of secondary literature on Sismondi, due to his broad interests, and it is a demanding task to do justice to Sismondi, the historian and reviver of Classical political economy, to his political writings and activities, to his contributions to literary history, and to the diverse intellectual and personal relationships he entertained with important contemporaries in his native Geneva and in Italy, France, England, and Germany.¹⁶ Far from being a petit bourgeois socialist, as Marx claimed, he was a liberal cosmopolitan who was fond of the old patrician Republic of Geneva and who therefore felt attracted by English society and its political thought. His criticism of English industrialism was born of his disappointment over the negative side-effects of the factory system, which he considered to be a development in the wrong direction. He was looking for the seeds of a free republican form of the state, based on a creative entrepreneurial spirit, in the early modern Italian city-states. He devoted a multi-volume historical study to this topic, which made him one of the fathers of the Italian Risorgimento, the national rejuvenation that followed centuries of political, economic, and intellectual decline, and of territorial disintegration and dependency on other states. Even more detailed historical studies were dedicated to French history; in these, he celebrated, among other things, the vitality of Medieval rural production. Through Madame de Staël and Schlegel, he was connected with German Romanticism; he especially admired the historian Johannes von Müller, whose lively form of presentation is still impressive, even though his understanding of history is far removed from that of modern times.

It is not easy to capture the personality of someone characterised by such peculiar inclinations and achievements. Hence, historiographical accounts of Sismondi as an economist try to focus on his text and to present the theory. However, this theory is also shaped by the ambivalences of the author, who, on one hand, wanted to be progressive but, on the other, was influenced by examples of the vitality of free agrarian societies which he found in history and experienced in his own times. Sismondi's disgust at the excesses of early industrialisation combined with a critique of the economic method practiced by the Ricardo school, a method which abstracted from any concrete social conditions of life. His own theoretical ideas point far beyond his own time, but, partly due to a lack of analytical power and partly due to the intended vividness of his style, they do not acquire contours that are sharp enough for constructing a theory out of them that would be antithetical to Ricardo's. There are only individual pieces for such a theory. Those historians of economic dogma who limit themselves to a consideration of the text of the *Nouveaux Principes* are thus forced to make an arbitrary selection in order to present a Sismondi they find acceptable as an alternative to the mainstream of classical economics.

II.

Jean Charles Léonard Simonde was born on 9 May 1773 in Geneva as the son of a parson. He retained happy memories of his parents' countryside home. Following time as an apprentice at a merchant house in Lyon and with a cloth merchant in Geneva, and after having studied experimental physics and law, he fled with the family to England at the end of the *Ancien Régime* in Geneva in 1792. Returning to Geneva in 1794, father and son were arrested during the reign of terror but, fortunately, only for a short period of time. The family next went into exile in Italy, where the young Simonde studied the agrarian culture of Tuscany, to which he found himself very attracted. And he discovered the history of the Ghibelline House of Sismondi, trying to establish it as his own ancestry. Hence, his new name: Simonde de Sismondi. He published on Italian and English agriculture, and, having once more returned to Geneva, he was employed by the chamber of commerce between 1802 and 1813 as secretary and '*éminence grise*'. During that time, he wrote a *Statistique du département du Léman* [Statistics of the département Léman] (only published, however, in 1971), which is important in terms of local history.¹⁷ In 1803, he published *De la richesse commerciale ou Principes d'économie politique, appliqués à la législation du commerce* [On commercial wealth, or Principles of political economy, applied to commercial legislation], in which he promotes freedom of movement and free trade along the lines of a Smithian liberalism. He then accepted an appointment as Professor of Moral Philosophy at the University of Geneva without ever having completed any academic studies as a student.

Sismondi had actually been educated in libraries and salons – in particular, the salon of Madame de Staël. From 1807, his *Histoire des Républiques Italiennes* [History of the Italian republics] appeared in several volumes. It was followed by a history of France, of which, in 1816, he remarked to Madame de Staël that it followed a related theme in the sense that he wanted to emphasise the independence of the history of the various regions which, over long periods of time, formed sub-states that were keen to maintain their autonomy – almost resembling the individual states under the Holy Roman Empire of the German Nation – before they were united and aligned with one another through the exercise of royal power.¹⁸ His friends were therefore surprised, as were later generations, that he associated himself with Napoleon's Hundred Days Regime. The French, who anyhow considered him eccentric, would have forgiven Sismondi for being Swiss because of his special talents. Salis quotes Anatole France as follows: '*Quant à être Suisse . . . c'est une disgrâce qu'on fait oublier par l'esprit et les talents.*' [As far as being Swiss is concerned . . . this is a disgrace one tries to forget with the help of spirit and talent] (Salis 1932, p. 4, my transl.).

After the final fall of the emperor, Sismondi returned to Geneva. He had inherited some land and married Jessie Allen, an Englishwoman who was a relative of the Wedgewood family and an aunt of Charles Darwin. Their life together in the country house near Geneva was mostly determined by his incessant work as an author, surrounded by books. He once wrote that they lived together in the past. However, Sismondi also intervened as a political author, in particular as an

opponent of slavery. In 1819, he published the *Nouveaux Principes*, which had been composed with the intention of introducing humane principles into the economic sciences. He harboured few illusions about the success of his attempts. His domestic happiness, his work on history, and a religiosity that was only faintly influenced in confessional terms by Protestantism enabled him to live a life that was in tension with the developments in the real world. His fame had spread across Europe and earned him memberships in various academies. Although the increasing radicalisation of Switzerland during the time of the Regeneration, between the Helvetic Republic and the revolution of 1848, remained alien to him, until the end of his life he did not shy away from being politically active in his native city, involving himself in questions of communal life such as the introduction of sidewalks (the poor are walking) and the aesthetic improvement of buildings (from which he also expected an educational effect). Sismondi died on 25 June 1842. His widow returned to England, where she died eleven years later. Her last words, as reported by Berchtold, were: ‘Sismondi, I am coming’ (Berchtold and el-Wakil 1991, p. 35).

The first volume of the *Nouveaux Principes* sketches the emergence of political economy and the fundamental principles of the creation and development of wealth.¹⁹ It is followed by books on *Richesse territoriale* [Wealth of the land] and on *Richesse commerciale* [Commercial wealth], i.e. a juxtaposition of agriculture, on one hand, and industry and commerce, on the other. The examination of agriculture is organised according to historical and various other aspects and differentiates between, for instance, family-based peasant farming, slave economies, sharecropping, soccage, and other forms. These are distinguished conceptually but are not presented in historical sequence, although Sismondi indulges in rich and manifold historical illustrations. The investigation culminates in a critique of the Ricardian theory of rent, which is accused of being based on false premises. Ricardo, Sismondi claims, is familiar only with the lease of land and overlooks the fact that even in rural England, other forms of land ownership exist that are superior to the tenancy system. Here, Sismondi is probably thinking of independent farmers. He considers the idea of rent-free land to be a misleading abstraction, as even in America the soil is not available for free. The levelling of profit rates, he argues, takes place at a slow pace, and lease contracts are modified only rarely. Thus, the rent to be paid may well result in an overall deduction from the average profit of the tenant. The monopolistic aspect needs to be taken into account (monopoly understood not in the sense of modern economic theory, but in the sense of Adam Smith). Sismondi also raises doubts regarding market prices approximating natural prices. Only once all of these factors are taken into account can Ricardo’s theory of differential rent be applied.

This critique is not only motivated by a sense of realism which questions the abstractions that inform the model. Sismondi assumes the relative autonomy of institutions which do not move towards capitalist economic forms according to some inevitable logic. Marx, too, will later criticise Ricardo for dealing exclusively with the tenancy system and mock him for otherwise being familiar only with Owen’s parallelograms, i.e. a specific type of socialist utopia. There is no

such general determinism in Sismondi, the historical thinker, who insists on the advantages of other forms of production – in particular, that of an independent peasantry, which he juxtaposes to the allegedly progressive and economically superior English tenancy system. And in fact, independent peasant farming, although with some modifications, has prevailed to the present day.

Let us take a look back at this point at one of Sismondi's two main works on history, in order to demonstrate that he not only included examples from economic history in his *magnum opus* on economics, but also, in reverse, took economic relations, especially their institutional frameworks, into consideration when writing as a historian. Toward the end of his life, he wrote a summary of his history of France under the title *Précis de l'Histoire des Français* [*Précis of French History*].²⁰ He was probably aware that even sophisticated members of the educated classes would not be able to read and remember the thirty-one volumes of the original work. The *Précis*, which looks at the changes in morals (virtues) in particular, also sketches the emergence of the feudal system.

In seventh-century France, Sismondi says, there were only three estates: slaves or serfs, land-owning freemen who fought in the army and took part in people's assemblies; and above these two, the powerful dukes and counts who counted on the support of those loyal to them. As the empire expanded under the rule of Charlemagne, it became increasingly difficult to persuade the freemen to engage in military service in more distant provinces, which more often came under attack.

The dukes, the *grandeers*, who had to take these *arimmani* (armed men, B. S.) into the army, and who did no longer find enough of them in order to fill their ranks, tried to replace them with a new class of men, the *beneficiaries*, *liegemen*, *vassals* to whom they distributed new lands, under the strict condition that they would always be prepared to take up arms for them, in the case of wars of aggression, *fehde*, as much as in the case of defensive wars, *wehr*.

(Sismondi 1839, pp. 122f.)

The feudal system, whose development Sismondi goes on to describe in the historical political context, reached its climax in the eleventh and twelfth centuries: 'In every faction, the feudal system, as though through magic, gave birth to wheat and soldiers' (Sismondi 1839, pp. 228).

Both the population and wealth grew in the eleventh and twelfth centuries. The building of cathedrals bears visible testimony to this:

With the population, with the protection of people and goods, we are seeing wealth being reborn. The labour produced an enormous surplus which wasn't devoured, as it is today, by luxury or used for paying the interest on the state's debts. And it did not lose its exchangeable value through the exaggerated competition of a commerce which exceeds the needs of the consumers. Rather, this surplus emerged from consummation in order to convert itself into imperishable monuments . . .

(Sismondi 1839, p. 187)

As we can see, Sismondi emphasises legal certainty and the absence of overproduction and of burdening sovereign debt. He admires the level of cultivation of land that had been achieved, as well as the fortification of towns and the buildings. At this point – despite the fact that in the *Nouveaux Principes* he is actually critical of serfdom and soccage – he comes up with the following claim: ‘ . . . one will not hesitate to recognize that in no other period did the wealth of a people multiply as rapidly’ (Sismondi 1839, p. 231).

It is neither the general laws of economics nor early forms of capitalism but the specific mode of production of the feudal system which produced the admired cultural achievements of the high Middle Ages, together, incidentally, with a historically specific system of values and virtues which were, in turn, exposed to specific threats of their decline.

However, Sismondi decisively rejected the idea that he might be a *laudator temporis acti* [a praiser of times past]:

I have been pictured as being, in political economy, the enemy of society’s progress, a supporter of barbarous and oppressive institutions. No, I do not desire any part of what has been, but I want something better of what is. I cannot judge what that is, except by comparing it with the past, and I am far from wanting to restore ancient ruins if I show with their help the eternal needs of a society.

(Sismondi 1990, p. 628)

Given Sismondi’s special appreciation of the independent economic activity of landowners, it seems plausible to link his critique of the industrial system of production with the Aristotelian opposition between a natural economy and chrematistics. The economic activity of the independent landowner preserves traditional bourgeois virtues, while the potentially infinite acquisition of wealth transcends traditionally accepted limits. Priddat has demonstrated such a connection to Aristotle in the work of Sismondi.²¹ But this approach hardly does justice to Sismondi as a theorist of the industrial system and as a disciple of Adam Smith. Still, he wrote, ‘The strongest safeguard of an established order may lie in the existence of a numerous class of peasant proprietors’ (Sismondi 1990, p. 146).

In his introduction to the second edition of the *Nouveaux Principes*, published in 1827, Sismondi summarised his analysis as follows (cf. pp. 7ff.):²² In the course of the seven years since the original publication, the facts, he says, have begun to speak in his favour. There are unexpected crises in trade; the rich have become richer, but the poor also poorer; and enterprises are in trouble as well. The aristocracy does not feel safe; bourgeois families are often threatened by bankruptcy; the independent peasantry and the crafts are being suffocated, and mechanisation repeatedly creates unemployment. And all this despite the fact that England is a free, enlightened, and well-governed nation protected by a trust in the law. What is giving rise to the crises is a lack of proper balance between distribution and growth of income, on one hand, and growth of production and capital, on the other. In other words, Sismondi sees a lack of balanced growth.

The historians of economic thought were right in considering Sismondi's contribution to the theory of economic crises as his single most significant contribution to the discipline. From the correspondence and conversations between him and Ricardo, we can easily see that Sismondi challenged the ideas of the discipline and its leading figure, i.e. Ricardo, in this regard. Ricardo notes in his diary of continental travel: 'Mister Sismondi is a very agreeable man, but he differs greatly from me on the principles of Political Economy' (Ricardo 1965, vol. X, p. 278). And in a letter to Hutches Trower, he summarises their conversation, saying,

He [Sismondi] holds that the great course of the misery of the people of all countries is the unequal distribution of property, which tends to brutalise and degrade the lower classes. The way to elevate man, to prevent him from making inconsiderate marriages, is to give him property, and an interest in the general welfare; – thus far we should pretty well agree, but when he contends that the abundance of production caused by machinery, and by other means, is the cause of the unequal distribution of property, and that the end he has in view cannot be accomplished while this abundant production continues, he, I think, entirely misconceives the subject, and does not succeed in shewing the connection of his premises with his conclusion.

(Ricardo 1965, vol. IX, p. 243)

Sismondi, for his part, thought well of Ricardo as a person:

On two or three occasions, we discussed that fundamental question on which we were in opposition. His considerations were informed by an urbanity, a good will, and a love of the truth which distinguished him, and a clarity which his disciples themselves would not have expected from him, accustomed as they were to the efforts at abstraction which he required of them as government advisers.

(Ricardo 1965, vol. IX, p. 244, my transl.)

In one respect, however, Sismondi and Ricardo had moved closer to each other: Ricardo had admitted that the introduction of machinery can lead to unemployment caused by technology. Malthus showed himself to be very pleased about this admission in a letter to Sismondi.²³ McCulloch's reaction to this change in Ricardo's opinion, by contrast, consisted of a snappy and irritated letter, in which he accused him of having defected to the camp of Sismondi and Malthus in the machinery question:

Your argument is to be sure hypothetical; but the hypothesis will be thrown aside, all those who raise a yell against the extension of machinery, and ascribe to it that misery which is a mere necessary consequence of the oppressiveness of taxation, and of the restraints on commerce will fortify themselves by your authority!

(Ricardo 1965, vol. VIII, p. 384)

Sismondi discusses unemployment as a consequence of the incongruence between the growth of population, capital, and productivity:

But an inordinate increase of population is not the only cause of this national suffering by breaking the equilibrium between the supply and the demand for labor. The demand for labour may decrease, and the population continue stationary. Consumption may be arrested, revenues dissipated, capital destroyed, and the number of hands formerly occupied may no longer be able to find sufficient employment. . . . As day labourers are more eager to receive even the smallest wage, then merchants to employ their money, the former are laid under conditions more and more hard, as the demand for capital diminishes; and they conclude by contenting themselves with so miserable a remuneration, as is scarcely sufficient to maintain them alive.

(Sismondi 1990, p. 555)

The decline in demand can be caused by a weakening of the entrepreneurial spirit or, especially, by new inventions, if the lower costs of production which they bring about does not lead to new sales. Sismondi uses the printing press to give a hypothetical example: if it had already been invented by the Arabs in the tenth century and brought to Europe, it would have made the copyists redundant, due to the absence of an increased productivity at a time when intellectual endeavours were not yet of great importance. Fortunately, the printing press was introduced at a time when scientific curiosity had already progressed, so that it led to substantial new employment (Sismondi 1990).

Sismondi's theory of economic crisis, however, goes further than the points conceded by Ricardo in his chapter on machinery. As Henri Denis has pointed out, the theory is based on the periodic cycle that Sismondi introduced: the monetary income of a particular period is used in order to buy the production of the subsequent period.²⁴ If we look at the cycle from the perspective of modern macroeconomics where output, with a certain delay, leads to income-generation (output-income-lag), and then income, with a certain delay, leads to demand (Robertson-lag), and demand, again with a certain delay, to output (Lundberg-lag), we see that unintended savings may arise when demand does not altogether equal income (Robertson-lag). However, output may also exceed demand when investments turn out to be larger than intended (Lundberg-lag).²⁵

Of course, these are not the concepts used by Sismondi. In order to determine disequilibrium, one first needs to define what constitutes equilibrium. Classical economics always distinguishes between income from wages and income from profits and associates them with different patterns of demand. For that purpose, as Skourtos has shown, Sismondi uses a corn model of the kind Sraffa identified in Ricardo. This model has been used again and again in the school of Ricardo, although in most cases under the assumption that Say's law is correct, while Sismondi, according to Skourtos, also uses the corn model in order to question the validity of Say's law.²⁶

In the context of this introduction, Sismondi's theory of disequilibrium cannot be presented in detail, but we refer the reader to Parguez's attempt at translating Sismondi's analysis into Keynesian concepts.²⁷

Spiegel mentions some of the economic policies that Sismondi suggested as remedial measures to alleviate the ills diagnosed by him.²⁸ Among them are policies

regarding growth and population; a limitation of working hours, especially measures to combat child labour; a minimum wage; models for a workers' share in company profits; and toleration of trade unions; however, in more general terms, mainly more solidarity. Sismondi proposed to place the cost of workers' accidents on the entrepreneur because he thought this would improve the protective measures taken to avoid such accidents. He also cautiously introduced the purchasing power argument of wages. Sismondi was searching for a broad concept of welfare that would instruct economic action.

However, Sismondi also saw clearly that there were limits to the possibilities for intervention, and throughout his life he remained sceptical toward the expansion of state influence. The state can only promote the economy in a measured way:

. . . government is the richest of all consumers; it encourages manufactures by the mere circumstance of giving them its custom. If to this indirect influence it joins the care of rendering all communications easy; . . . of protecting property, . . . ; if it does not overload its subjects with taxation; . . . – it will effectually have served commerce . . .

(Sismondi 1990, p. 342)

In light of such remarks, Spiegel calls Sismondi a modern liberal who tried to overcome the older liberalism of Smith and who sought solutions which would not produce the excesses of the modern welfare state. In that sense, Sismondi was far ahead of his time. He included the institutional and the historical aspect in his considerations and warned against the mere abstractions of the Ricardo school of thought, as if he had foreseen the dangers inherent in the complete separation of the economic and the social sciences from which the last century suffered and from which we are still suffering today.²⁹ The German debate on the social welfare state, too, was an expression of neoliberalism and based on a critical continuation of economic theory in connection with institutional aspects. In retrospect, authors such as Rüstow and Röpke appear to be kindred spirits to Sismondi – think of Rüstow's attempt at writing a history of the opposition between freedom and totalitarianism, and of Röpke's attempt at founding a 'vital politics'. For a long time, discussions of Sismondi were determined by his appropriation by the socialists at the middle of the nineteenth century. They rejected his liberalism but made eclectic use of parts of his theory. Today, we have reason to read Sismondi's work with fresh eyes.

Charles Babbage's *On the Economy of Machinery and Manufactures*

I.

Babbage a classic author of political economy? Just a few years ago, even specialists hardly knew his name. But since the development of semi-conductor technology widened the application of electronic computing to an unforeseen degree, even the

wider public has heard about the amazing and peculiar achievements of the ‘computer pioneer’ Babbage. On the occasion of his 200th birthday in 1991, many articles reminded their readers of the greatness and eccentricity of the man. One such article was called ‘Efficient Knowledge’; another was called ‘Metal Cracker’.³⁰

To mark the anniversary, the Science Museum in London built the ‘Difference Engine No. 2’ – designed by Babbage but never actually executed before – and proved that it functions. The engine seems a symbol of the many dis-synchronicities which characterise Babbage’s life and make his work so fascinating. Important principles of the electronic computer are here applied in the form of a purely mechanical machine. One may object that in the historiography of science, all too often sensational claims are made by ascribing the origins of a modern idea to some early precursor. And no one claims that there has been any continuity in the development of designs for calculating machines. To the extent that the structural principles of the electronic computing machines designed in the 1940s resemble those of Babbage, this is a case of rediscoveries. But while it would be wrong to speak of a direct lineage, one rightly feels that Babbage was able to anticipate essential features of an idea that was realised only a hundred years later and in a different medium.

The intellectual daring which made this possible shows in the methodology Babbage applied when addressing questions of economics and management. Babbage was, indeed, also an economist. As we shall see, there is an essential connection between his views on the division of labour and technical progress, on one hand, and the fundamental idea on which his construction of calculating machines is based, on the other. His analytical mind transcended the traditional disciplines of scientific thought. The process of calculation, a piece of intellectual labour, was passed on to the machine. The natural division of labour was subjected to a process of operational optimisation. His rationality made Babbage both a prominent defender of more efficient economic organisation (in the context of a polemic surrounding the leadership of the Royal Society) and an industrial inventor. Details of his lifestyle and his political interventions bear testimony to his idiosyncratic character – for instance, when he began his famous battle against the beggars and the street musicians of London who disturbed him in his scientific work. From 25 July 1864, street music was regulated and policed in London, and there were penalties for noise disturbances. Babbage is said to be responsible for the introduction of these measures.

Very few other people represent the dialectic of progress to the same extent as Babbage. Increased rationality opens up new possibilities, for not only material but also intellectual production; however, it also limits the spontaneity of life.

Babbage is one of the great mathematicians who not only helped to further formalise existing approaches in economics, but also instigated new sub-disciplines. Bernoulli, Cournot, and von Neumann opened up new pathways for the formal treatment of risk evaluation, for the analysis of imperfect competition, and for strategic behaviour. Babbage’s *Economy of Machinery and Manufactures* made no use of mathematical symbols; it was written for the intelligent layman and soon had widespread impact. The fourth edition appeared less than three years after

the first, and there were several translations and American editions. Babbage's intention had been to present the mechanical principles of industrial production processes. However, their analysis is combined with commercial analyses and references to connections with political economy, without entering systematically into the major controversial debates of Ricardo's time. The fruits, as well as the disturbing side effects, of the Industrial Revolution were about to affect the regional areas of Great Britain. It was the time of the Luddites and the fear of technological unemployment. As European history showed, economically motivated unrest may well be followed by political revolution. Babbage's commitment to a general enlightenment about the possibilities of industrial development; his preparedness to fight unjust practices that he came across, such as the forming of cartels (he suffered from a boycott of the booksellers whom he had accused of such practices); his reserved attitude in cases where he believed the answer to a question was still outstanding (see his deliberations on patent law in the preface to the second edition of his book) – all of these things gave a pragmatic foundation to the discussion of economic matters, whereas his inventive spirit gave rise to hopes for the future.

In the development of economic theory, a split between left-wing and right-wing Ricardians had occurred over the question of distribution. Long before Marx provided a sharp formulation of the theory of exploitation, the two sides argued about the origin of profits, the justness of wages that were based on the needs of subsistence, the length of the working day, underemployment caused by the use of technology, and the social consequences of the Industrial Revolution and its impact on the environment. While the friends and the foes of progress were facing each other, Babbage provided information on the conditions and possibilities of a rationally organised industry.

II.

Babbage's life (1791–1871) covers the period between the French Revolution and the Franco-Prussian War, during which England consolidated its economic supremacy and turned it into imperial predominance. He received his university training at Trinity College and Peterhouse College, both at Cambridge. Later, he would say that he contented himself with a bachelor's degree because he had been irritated by the backwardness of his academic teachers, who did not take any notice of the progress made by mathematical research on the continent. It is, indeed, true that Cambridge's academic standing at that time cannot be compared to the seventeenth century, when Newton taught there, or to the late nineteenth century, when Cambridge, following reforms, again became a leading institution in the sciences and also in economics. Babbage was a diligent student, even in the absence of any external pressures. On the basis of his achievements in the sciences, in 1828 he was elected Lucasian Professor, the chair once held by Newton. Babbage accepted the honour, but he neither took up residence in Cambridge nor taught regularly there. In 1816, he had already been appointed as a member of the Royal Society in London, where he lived from 1815 as a mathematician and

a scientist, an experimenter, and an observer of the economy and a political critic. His private fortune and income allowed him to pursue his manifold interests and to promote state policies on technology. From 1827 to 1828, he travelled on the continent, and he refers to the experiences he had during that time in many places of his work. It is worth noting that he did not embark on these travels together with a scientist or a servant, but with a precision mechanic who had worked on the calculating machine for him. Babbage visited the Netherlands, Germany, Austria, and Italy, and he did not miss any opportunity to visit workshops and factories. His *Reflections on the Decline of Science and on Some of its Causes* appeared in 1830, two years after his return to England. Having become familiar with the organisation of science in other countries, he wrote the *Reflections* as a courageous attack on the incrustated structures of contemporary English science. Our book also contains traces of his European travel.³¹

Babbage's manifold interests include a work on statistics and life insurance and a book on the advantages of an income tax that is not burdened by too many exceptions (*Thoughts on the Principles of Taxation*, 1848). He proved to be a pioneer of cost-benefit analyses, which made him speak out in favour of uniform postal tariffs and broad gauge railways. His practically minded inventive spirit produced results ranging from bull bars for locomotives and a water meter to signal generators for lighthouses. His inclination towards practical matters also showed in his mathematical work. He became one of the leading cryptologists, i.e. an expert in the theory of the codification of messages. Numerous passages in *On the Economy of Machinery and Manufactures* mention observations which prompted the author to think of new inventions. The transition between inventions for which he could claim genuine priority and ideas where he only wanted to support their dissemination is gradual. An example would be the vivid description of a simple instrument for registering earthquakes, which a coincidence had brought about:

A glass vase, partly filled with water, stood on the table of a room in a house at Odessa; and, from the coldness of the glass, the inner part of the vessel above the water was coated with dew. Several very perceptible shocks of an earthquake happened between 3 and 4 o'clock in the morning; and when the observer got up, he remarked that the dew was brushed off at two opposite sides of the glass by a wave which the earthquake had caused in the water. The line joining the two highest points of the wave was, of course, that in which the shock travelled.

(Babbage 1835, p. 60)

This observation, taken from a communication of the Academy of Science in St. Petersburg, caused Babbage to suggest a principle for constructing seismographs:

In order to obtain some measure of the vertical oscillation of the earth, a weight might be attached to a spiral spring . . . and a sliding index be moved by it, so that the extreme deviations should be indicated by it.

(Ibid., p. 61)

However, the *Brockhaus-Konversations-Lexikon* of 1903 mentions that a 'seismograph' of this design had already been invented by Salsano in 1784 in Naples. And didn't Babbage visit Naples? However, as the secondary literature calls Babbage the inventor of a seismograph, his design probably had some unique features.³²

Of course, calculating machines existed for a long time before Babbage. In 1685, Leibniz had already remarked that it was unworthy of a scientist to perform calculations for hours on end when this task could be performed by machines.

Blaise Pascal designed a mechanical calculator in 1642, and in 1820, De Colmar introduced his 'arithmometer', the first machine to reliably perform arithmetic operations. In 1784, Johann Müller built a calculating machine on the basis of Leibniz's ideas. It was able to carry out precise calculations to the fourteenth decimal place and was designed for the usual arithmetic operations. It also had a warning bell which alerted the user to incorrect inputs. Only small-scale models of Babbage's far more ambitious designs were produced during his lifetime. The first of these, based on the fundamental ideas of Babbage's 'Difference Engine', was completed by a Swedish father and his son, Georg and Edvard Scheutz, in 1843.

In the early nineteenth century, more substantial calculations were carried out using logarithmic tables. This was not only cumbersome (and required the even more cumbersome prior construction of the tables themselves), but was also considered unreliable because it was almost inevitable that the tables would contain mistakes. In the context of nautical calculations, so it was said, such mistakes might even lead to shipwrecks. Thus, Babbage's fundamental idea was the invention of a calculation machine that would perform the construction of logarithmic tables on a mechanical basis by at the same time calculating and punching the results into soft cardboard. The cardboard could then be used for casting printing plates. His 'Difference Engine No. 1', the largest of the apparatuses Babbage tried to build, was developed from 1824 onwards. It would have consisted of about 25,000 individual parts, with a dimension of two and a half metres in height, two metres in width, and ninety centimetres in depth. By 1832, only a small apparatus, roughly a seventh of the original plan in size and without the printing part, had been realised. It is still functional today.

Around 1834, Babbage designed a far more ambitious and technically more sophisticated machine called the 'Analytical Engine'. His fame as a pioneer of computing rests on this revolutionary concept. The envisaged number of parts was even higher in this case, and one of the novelties introduced were punch cards for programming the calculator. There were also memories for storing intermediary results and programmes for partial calculations. Whether or not this apparatus would have achieved the intended goals remains a controversial question. Between 1847 and 1849, Babbage designed the 'Difference Engine No. 2', a simplified version of the original one, and we know what this engine can do because it was built on the occasion of Babbage's anniversary in 1991. Babbage published little about the technical detail of the 'Analytical Engine', but there is an archive containing his drafts. Luigi Menabrea, an Italian engineer, published an article on the principles of its construction in 1842, based on a talk given by Babbage in Torino in 1840.

This sketch was translated into English by Ada Lovelace, the daughter of Lord Byron, and additional comments were added after consultation with Babbage. We need to mention that to carry out such a scientific project was highly unusual for a woman at that time. It was as if the spirit of Romanticism wanted to take hold of the incredible thought of the industrial application of mathematics.

III.

In an introduction to Babbage's economic work, there would be little reason to mention Babbage's achievements in the construction of calculating machines if the two areas were not connected, and if his work on the realisation of his technical plans did not form part of the experiential background to the arguments presented in *On the Economy of Machinery and Manufactures*. The problems he encountered when trying to build his calculating machines are a vivid illustration of the need to standardise the components of machines and to produce them with a high degree of precision, if malfunctions are to be avoided. A whole chapter is dedicated to various means of copying, and finally Babbage illustrates its principles using the process of printing the very book itself (Babbage 1835, p. 113). The potential of reproduction, 'as in every department of manufacture', contributes to the uniformity and cheapness of the product, thus enabling returns of scale.³³

Even more important is the connection with his theory of the division of labour, which contains a remarkable chapter on the division of intellectual labour. It tells the story of how, in France during the time of the revolution, Smith's analysis of the division of labour was applied to the construction of logarithmic tables by limiting the task of the mathematicians to the conceptual part of the work, while, depending on their level of difficulty, the actual calculations were done by employees of various degrees of mathematical competence. Babbage explains the theoretical background by demonstrating for the simple example of a progression of square numbers how their calculation can be derived from the calculation of the first differences (which form an arithmetical progression), and these, in turn, from the second differences (which are always 2). This indicates the principle of the 'Difference Engine'. Babbage points out that the smaller version of the 'Difference Engine', which had been realised by the time of the book's fourth edition, is capable not only of compiling tables of square numbers, cubic numbers, and parts of logarithmic tables, but also of certain complicated arithmetic progressions whose differences are not constant.

In his analysis of the division of labour, Babbage first demonstrates what today is considered the main thesis with which he moves beyond Smith, namely that cost savings can be achieved through the division of mechanical, as well as intellectual, labour by applying the precise amount of skill and knowledge that is necessary for the execution of each partial task.³⁴ This avoids anyone being employed at any time for performing a less qualified task than would correspond to the wage he is paid. This applies to the manufacture of pins, where, in Babbage's quantitative example, the most qualified worker receives ten to twenty times more in wages compared to the least qualified. But it also applies to

intellectual labour, where it is simply not necessary to employ a qualified mathematician to carry out simple additions.

Babbage's considerations regarding the staffing of production processes built on a division of labour, with workers who have diverse qualifications and wage entitlements, presuppose a fixed hierarchy of work tasks, as well as the individual worker's knowledge. Babbage also suggests that one should look at the planning and coordination of the work as an administrative task to be done by individuals who are especially appointed to it. As emphasised recently by Pagano, Babbage thus points out the necessary conditions for an efficient use of the potentials for the minimisation of costs that arise from the various ways in which the division of labour and staffing can be implemented. Smith, by contrast, placed greater emphasis on the learning processes promoted by the division of labour. In the case of Smith, Pagano says, the differences in qualification between the workers are even a consequence, rather than the cause, of the division of labour, because perfection in the skills of a craft is acquired only through the frequent repetition of the same manual operations. Pagano considers the other potential for greater efficiency – namely, the reduction of the time needed for changing from one task to another – to be of only secondary importance. The fostering of learning processes, according to Smith's notion, requires a less pronounced division of labour, compared to Babbage's notion, and it also gives rise to more communication between management and workers.³⁵

However, Babbage's work also contains reflections on changes in the form the division of labour takes. These are associated with thoughts about motivational factors (even if they do not yet include ideas on the determination of relative wages as specific as those in the literature of Taylorism). But first of all, he associates the division of labour with technical progress. Whereas previously the genius of the individual inventor had been credited with technical improvements, under Babbage's analytical gaze, inventions become the result of an *ars inveniendi*: again and again, he demonstrates how a systematic arrangement of a task leads to its solution.³⁶ And he proves that this arrangement is structured by the economic process and the division of labour. Once the labour is sufficiently divided up and the individual tasks are sufficiently simplified, an inventor can substitute a standardised mechanical process for the standardised manual operation.³⁷

Ultimately, the principle of the division of labour is extended right into the process of technological development itself:

It follows, that the efforts for the improvement of its manufactures which any country can make with the greatest probability of success, must arise from the combined exertions of all those most skilled in the theory, as well as in the practice of the arts; each labouring in that department for which his natural capacity and acquired habits have rendered him most fit.

(Babbage 1835, p. 379)

Such a division of labour requires, among other things, a learned society, Babbage adds, pointing to his polemic on the leadership of the Royal Society.

In the future, he hopes, the sons of the industrial bourgeoisie will also dedicate themselves to industrial research; this class of people would be able to combine scientific knowledge with practical experience. A look at the state's possibilities for promoting technological development confirms the saying that knowledge is power, he says. Of course, there are many who doubt that the fast development of modern times can continue forever. Will the coalmines not soon be exhausted? From our perspective today, it is striking that the last examples which Babbage quotes in support of his vision concern the replacement of fossil fuels through the exploitation of tidal and geothermal energy (*ibid.*, p. 389).

The analytical essence of Babbage's vision of the increase in productive forces lies in his emphasis on the returns to scale, which allows a form to be derived from a particularly simple formal principle. Labour processes must be proportionately related to one another in such a way that workers of all levels of qualification are used to capacity. Larger enterprises, for combinatorial reasons alone, have better opportunities for employing each worker in a suitable place, so that, together with a right-sized group of equally qualified colleagues, he is provided with intermediate products, as well as passing on the semi-finished products, and all of this so that optimal use is made of the labour power of the workers who come before and after him.³⁸

Although this picture of the allocation of work again seems to opt for static comparisons, Babbage also suggested incentives for its transformation. He propagated a share in the profits for workers, and he recommended that every employer who suggests an improvement in the production process should be given a reward which at least equals the profit that might result from its application elsewhere.³⁹ While those working in the tradition of Ricardo analysed distributive problems mainly at the macroeconomic level, Babbage was looking for – as we would put it today – an incentive-based wage system at the microeconomic level.

Babbage was fully aware that his efforts to combine theory and practice were in stark contrast to the abstract orientation of the theoretical economics of the Ricardian era. As Rosenberg points out, Babbage was rarely quoted, except by Mill and Marx. The fact that Cournot mentions him in connection with a remark he had made on Russian platinum coins is a curiosity which confirms how different the interests were of this theoretically more important contemporary.⁴⁰

Babbage's unbiased look at the possibilities for technological, as well as socio-economic, improvements assigned him a place outside of the established factions. His backing of the piece wage system and of profit-sharing, which are described in the chapter 'On a New System of Manufacturing' (*ibid.*, pp. 250–9), can be interpreted as a response to the theories of exploitation which were beginning to appear on the horizon.⁴¹

It has been said that the radicalness of these suggestions was exceeded only by that of the cooperative movement, in particular that of Owen (*cf.* Berg 1987). However, that Babbage was no radical in the political sense can be seen from the fact that he warned against the danger of the trade union movement accelerating the growth of technological unemployment.

Given Babbage's exceptional intelligence and unusual range of knowledge, it is easy to believe that he would have been able to produce one of the fundamental

works in economics if he had fully dedicated himself to that discipline. But it was only one of his lesser interests, which in the first place were concerned with the application of scientific principles in practical contexts and especially with the transition from mathematical to technical calculation. For that reason, *On the Economy of Machinery and Manufacture* is more of a collection of reflections and experiences than a theory of new industrial developments. When Marx turned his attention to technical progress, he decided to produce a phenomenological description which was influenced by Babbage in important details but ultimately only found its way into the theoretical system of values and prices in the form of one important hypothesis: namely, the assumption of an increasingly 'organic composition' of capital – a hypothesis which Marx thought to be of epochal significance, but which probably only corresponded to reality within a limited historical period. The hypothesis allowed Marx to combine his typology of technical development with the quantitative analysis of growth in such an elegant fashion that many unsuspecting readers missed the historical specificity of his construction (Schefold 1976b).

Instead of formulating empirical generalisations as abstract fundamental ideas and then synthesising these into theoretical systems, Babbage, as an economist, was again and again tempted by new practical designs into leaving behind any theoretical line of inquiry he might have been following, despite the persistence he showed as the constructor of the calculating machine. No sooner was one line of inquiry left behind than another one was taken up, in order to explore a different area from a modified perspective. This explains the non-systematic impression given by this fascinating book. Babbage does proceed in orderly fashion when he presents classifications – for instance, when he makes a conceptual distinction between tool and machine or when, early on, he derives the advantages of mechanisation from three sources, i.e. energy (beyond human labour power), productivity (economy of time), and the transformation of useless into valuable substances (new products) (Babbage 1835, p. 6). And his principles governing the division of labour do not lack internal logic. However, what is missing is a structuring of the economic system overall, using the means of economic theory.

The first part of the book deals with the 'mechanical part of the subject' and the second with the connection between the management of businesses and the economy. Often, the logic of the sequence of the sections is not intuitively plausible, not least because of passages added in later editions. Why, for instance, are the interesting reflections on the 'Verification of Price' (the problem of how to deal with the informational advantage of the vendor) placed after the section on the metallist theory of money (which contains interesting examples on how to save transport costs in money exchange) and before the central chapter on the division of labour? How does an obviously instructive chapter on what to consider before erecting a new factory end up between the sections on overproduction and profit sharing?

Yet despite these deficiencies in its structure – something, incidentally, that people have often criticised in Ricardo as well, who also came from a practical

background – the reader always learns to see new connections. The richness of ideas captivated Babbage’s contemporaries and was responsible for the fame that surrounded *On the Economy of Machinery and Manufacture* for a number of years. The return of interest in Babbage today, after he had been almost completely forgotten, is owed neither simply to the 200th anniversary of his birth nor exclusively to the achievements of the pioneer in computing, but to the fact that by now the science of economics has found ways of treating technical progress analytically and – from the perspective of evolutionary theories of competition and new conceptualisations of the rivalry between nations – of giving the process of economic growth a pivotal role in theoretical reflections and reflections on economic policy. For this type of research, Babbage’s book is yet again a rich source of theoretical ideas, as well as practical examples, which are presented succinctly, precisely, and vividly.

Karl Marx: the significance of the problem of the theory of the forms of value and the transformation of values into prices for capital

*The theory of forms*⁴²

The publication of the various versions of *Capital* in the second division of MEGA2 (the ongoing edition of the complete works of Marx and Engels in the original languages) makes it easier to perceive it as a work unified by the theory of the forms of value, with the analysis of the commodity and value as the basis; the theory of exploitation, the production of absolute and relative surplus value, accumulation, and circulation as the weight-bearing pillars; and with the transformation of surplus value into profit, interest, and rent, and with the emergence of revenues as the roof of the building. I have presented my position on volume III in the introduction to MEGA2 II/15 and expanded it in the new essay ‘*Zirkulation, Produktivität und fixes Kapital*,’ *Zum Erscheinen des MEGA2-Bandes II/12*’ (Schefold 2007).⁴³ Here I am attempting a complete overview, which, in the form of a blend of older and newer considerations of Marxian value theory, I have placed in front of the main part of this essay and which constitutes a revision of my introduction to II/15. Before beginning, I will allow myself a few personal remarks on this subject.

I have been fascinated by the theory of the forms of value, with its decidedly anti-modern logical structure, since my first Marx-reading with friends in Cambridge in 1969. I have also been in two minds about it: the arguments of Joan Robinson and Piero Sraffa, then the *genus loci*, as well as my education in mathematics and the natural sciences, spoke against it; my memory of philosophical texts, in particular Plato’s *Parmenides*, the ur-concept of dialectic, spoke in favour of it. Then in 1974, in Frankfurt, I came across a lively discussion which had emerged from the Frankfurt School, with Hans-Georg Backhaus (1978) the defender and Werner Becker (1972) the opponent of the theory of the forms of value. In my ‘Postscripts on Sraffa’ (Schefold 1976a), while explaining the relationship between Sraffa and Marx, I also attempted to understand the status of the theory of forms.⁴⁴ At the time,

this took place in the context of two different discussions: on one hand, the argument between Backhaus and Becker led to the problem of whether Marx employed 'correct' logic. Should contradictions lead to the conclusion that it grew out of false premises, or was the 'development' of 'contradictions' permitted? Since for me there was no satisfactory explanation of when the 'development' of contradictions could be viewed as reasonable and fruitful – when it led only to logical aporias, when the pointing out of a contradiction in the real world represented a justified critique of a social state of affairs that should be changed, or when it constituted a mere partisan denunciation of reality – I turned away from the theory of forms and continued my work employing the methods of the Cambridge economists on paths cleared by Keynes and Sraffa.

The discussion of Sraffa could not, on the other hand, be completely detached from Marx. Did Marx interpret Ricardo correctly? How was Sraffa to be viewed with respect to Ricardo and his labour value theory? Should one start off from a certain use-value structure and derive production prices on the basis of profit maximization, or was Marx correct to insist on value forms? Does that mean that in production price comparisons, it is necessary to integrate a cash advance? Was there something to the Marxian notion that outcomes of choices of technology are not simply based on rational profit maximization at given prices, but that they reflect irresolvable tendencies, not reducible to individual decisions, ultimately modifying progress?

Today, from a greater distance and a more liberal perspective, I see Marx closer to the Historical School, with which in the meantime I have had the opportunity to become more familiar. A rational reconstruction of other parts of Marx's works, in isolation from the Ricardian elements in his thought, remains interesting and possible and will also be described once again later in this essay. What conflicts with this approach, however, is that nowhere in his works does rational profit maximization alone determine the course of the analysis; rather, the actions of his agents are always embedded in historical constraints. His character masks do not act with complete, independent consciousness but rather remain prisoners of their origins, their standing, and the goals which derive from this, so they are subject to a given predetermination which enables Marx to let the sum total of the results of their activities follow certain tendencies – or, at least, to impute the results to such tendencies. Those who allow themselves to be taken in by this approach will not be convinced when it is demonstrated, for example, that the tendency toward impoverishment, i.e. a tendency toward the sinking of real wages, and the tendency of the profit rate to fall contradict each other, *to the extent* that capitalists choose technology for rational, economic reasons and no Malthusian-Ricardian shortage of resources reduces the targeted per-person surplus. In Marx, capitalists do not always act 'rationally,' in Menger's or Weber's sense, and they only really lack the general foresight imputed to Neoclassical general equilibrium theory so that disequilibria and simultaneous reductions in wages and profits are possible. And tendencies could alternate.

Hypothetical forms of societal development were being discussed even in the ancient world – concepts of decadence go all the way back to mythology – and

they are expressed in stage theories, as we can see with Adam Smith in the Scottish Enlightenment, but above all in the German Historical School. Stage theories could start off with a monotonically increasing advance when, for example, the economy integrates the domestic economy, the economies of the village, the city, and the nation, as well as the global economy. Moments of advance and retreat could overlap when – in Hildebrand’s trio of natural economy, money economy, and banking – the first stage is characterized as more humane than the middle one, while banking is supposed to offer new possibilities for individual development by enabling talented individuals to work toward economic and social ascent with bank loans.

Let us now examine the assumed society in which Marx embedded his commodity exchange. A development which serves not only the positive forces of progress is also traced out in his theory of value. At first, it is not clear which rationality he assumes and whether he wishes to offer an analytical-rational or a historical-intuitive theory. He clearly alludes to Aristotle, who, however, was attempting to derive an ethical-normative theory. And there we begin.

In Aristotle, exchange is handled within the framework of a theory of justice. After the discussion of commutative and distributive justice, exchange is an element in the consideration of the various forms of reciprocity, which is not, as such, always just – for example, the person fittingly punished is not allowed to inflict punishment on the punisher. Reciprocity can, however, be just, and this is illustrated, first of all, in gift exchange – not the exchange of commodities! – between free individuals. Spontaneous giving without immediate hope of anything in return is something holy – altars are created for the Charites – but it is permissible to hope for a sign of gratitude and a gift in return. Gifts are fashioned differently according to the position of the giver. In some situations, it is proper to give the bigger present to the higher person; in others, the lower person only attempts to make the higher better disposed to him or her with a gift that is at the limit of affordability. The exchange of equivalents among, as Marx will express it, owners of commodities possesses a different character for Aristotle, because – regardless of their social status, which is comparable merely by chance – equivalents are exchanged, so that the exchange is completely mutual, thus leading to no further duty, such as the favour of the higher who accepted the gift of the lower. Gifts now are commodities whose equivalence can be measured only by the money paid in exchange. On one hand, in such exchanges people give from their ‘work’; on the other hand, all households have their ‘needs’. After many centuries, the labour theory of value and the theory of use-value explanations of exchange relations derived from these ideas, which are not to be found in Aristotle (Schefold 1989b).⁴⁵

As is well known, comparisons between the exchanging of gifts and the exchanging of commodities play an important role in ethnology.⁴⁶ In gift giving, the giver’s status is essential, while in commodity exchange, both are equal. Gifts are given in the expectation, but not in the certainty, of a gift in return. Gifts are ranked according to qualities which, depending on circumstances, could be connected in a variety of ways with the giver’s status. In the simplest case, gift-givers

of the same status will bestow gifts of equivalent value on one another, but at different times, while the exchange of commodities of the same value takes place simultaneously. The fundamental characteristic of the exchange of gifts is mutual duty; the characteristic of the exchange of commodities, in contrast, is to exchange objects for different uses without limiting individual freedom through additional obligations, other than that of paying.

Marcel Mauss (1983) was not alone in emphasizing that a variety of transitions must exist between the polar institutions of exchanging gifts and exchanging commodities. For example, the exchanging of commodities in a barter economy often requires lending because the item desired in an exchange is not immediately available, and where legal institutions are insufficiently developed, credit then requires personal trust. Economics historians such as Alfons Dopsch (1968) point out that even after the introduction of money, over the course of millennia natural and money economies existed side by side because of a shortage of coins of sufficient purchasing power. Thus, a hut might be purchased with some silver coins; a horse, with a sack of flour and the promise of an additional payment of an agreed-upon sum in silver coins at a later date (Spufford 1991). Metallism and nominalism accordingly represent theoretical opposites in monetary theory, but both are in fact necessary in order to understand historical practice. Aristotle discusses these two theories. In the fourteenth century, a decided metallist such as Nicholas Oresme demanded that gold, silver, and copper coins circulate each according to their assay value (plus a compensation for the cost of minting), which demand, however, appeared to lack practicality simply because the metals underwent changes in value among themselves.⁴⁷ It was therefore considered appropriate when the precious metal coins circulated at their assay value plus a small extra charge, while copper coins remained in local circulation at nominal value.

Authors such as Aristotle and Oresme prove to those of us in Europe that from the ancient world to the medieval world, a deep understanding of economics was possible. The trading practices to which we pointed in the example of the purchase of a hut no doubt involve a rationality which is not so very different from modern decision-making in the retention of movable property, titles, and money. It was certainly clear to all hut buyers that they had better not give away all of their coins in this one transaction, if the next day they still had to buy work tools in order to repair the hut. And without any other security, our hut buyer could expect a loan only from being a moral person.

Nevertheless, Marx decided to develop a genesis of value forms employing an abstract language which did not refer to conscious acting but which still conveyed a logic in the creation of forms. He was not alone in this, because the Scottish Enlightenment already emphasized the development of more complex, unforeseeable outcomes from the sum of individual trades, as Hayek reminds us. The Classicists, especially Smith and Ricardo, may assume a more decidedly rational trade than Marx, and the Historical School takes into account various psychic dispositions of individuals, providing greater scope for collective-subjective organization through the 'spirit of a people', but the Classicists still do not wish to portray institutions such as money as the result of invention and consistent

policy. Marx may speak of an ‘act’ in the introduction of coinage, but in his analysis of simple exchange, conscious acting is not the subject, and with regard to the development of coins: what did the agent know?

Marx cites from the Book of Revelation *Apocalypse*: “*Illi unum consilium habent et virtutem et potestatem suam bestiae tradunt.*”⁴⁸ The creation of money appears as a world historical disaster which resulted from mechanically completed exchanges. Is that a European perspective? I ask myself whether this process might not be interpreted differently in East Asia. In Japan, the introduction of money is remembered as a historically unique political act carried out by one person, the Empress Genmei. It is said of the empress that she wanted to give the Japanese people money (the introduction of coins) in order to ease the burden of carrying goods (i.e. the transport of commodity equivalents) in a mountainous land.⁴⁹ The formulation makes it clear that the imperial administration knew the introduction of money was also associated with costs, since the state now had to obtain precious metal, mint coin, and later maintain coin circulation.

Is the Marxian depiction therefore an ideal type in Max Weber’s sense, because it emphasizes one particular element of a process, while leaving others abstract? It emphasizes the actions of people as ‘character masks,’ as the bearers of ‘unconscious’ social conditions (which are not understood by the agents), and it abstracts from sparks of conscious, deliberate action by regarding them as contingent events. Depending on the subject, Marx certainly deals with ideal types, but he was himself apparently convinced that reality should not be approached through the superimposition of ideal types after the fashion of Weber or of Eucken, but rather that he had touched on the essential core in his theory. In so doing, the first edition of the first volume appears to have been a decisive stage in the theory of forms:

between the various Marxian versions of the critique of political economy, the first edition of *Capital* takes its own place. It documents, specifically, a turning point in Marx’s working process, where he clearly decided in favour of a strictly dialectical logic of representation, particularly for commodity and money analysis.

(Marx 1980 [1867], p. II*, Introduction, my transl.)

I would say that the logic of representation may have a suggestive character but without being formally strict in all stages of its development. A language is fashioned which makes it possible to trace the spontaneous emergence of value relationships, general equivalents, and money. The terms for the logic of capital, which came later, in the second and third volumes, represent an expansion of this. That this logic of representation contains defects will be seen clearest in the treatment of interest, below. Nevertheless, it has maintained its appeal, especially in the sociological discussion, to this day.

I can illustrate the developmental logic with a single example. Marx enjoyed playing chess. Let us say that a queen is worth the same as a castle and a bishop, or a bishop is worth the same as a knight. Entirely in the sense of a Marxian establishment of averages, it is to be expected that with such a formulation, two otherwise

equally strong players who frequently challenge each other to chess remain equally strong when one takes away the queen and the other, a castle and a knight. Put differently, the sacrifice of a queen is on average worth a castle and a knight. Thus, you are also at liberty to use the simple value form throughout, and even the equivalence form in this example, and to say that the sacrifice of a queen is equivalent to the loss of a castle and a knight, hence that it expresses this loss.

A difficulty arises when it is concluded from the equation that ‘the two things must therefore be equal to a *third*, which in itself is neither the one nor the other’ (Marx 1887, p. 14). In the appendix to the first edition of the first volume, Marx refers to the weighing of various metals, such as iron and lead, which might be equally heavy, so that it would be possible to illustrate the relative value form and the equivalence form with them, and for which a common third, weight, obviously exists. In the first chapter of the same volume, he refers to the comparison of two triangles in respect of their surfaces. Our example and the use differ, however, in fine distinctions, which are theoretically important. There is an absolute value for weight, given that we can measure the earth’s acceleration at a particular place (if Marx did not actually mean mass, rather than weight; for mass, thanks to universal constants, we could refer to the unit mass of an elementary particle, a proton or an electron). In geometry, surfaces and surface units are defined, although the latter determination represents an arbitrary determination, due to the lack of geometrical elementary particles. I know of no such general reduction for equivalences among chess figures, but the playing strength of figures can be described as approximately many times the playing strength of pawns. Their value, however, depends on how far forward they have moved and how close they are to being queened. In this example, therefore, exchange relations without a ‘third’ exist.

Marx, who must have often pondered such problems, now proceeds as if it were completely natural that in the case of goods, only labour, which can be measured abstractly by the clock, could be considered a basis for comparison. The choice of time unit therefore comes from a determination prior to economic science. We interpret this suggestion for the determination of value as a hypothesis and set aside other potential sources of value determination, such as utility. Instead of that, we ask whether a standardized dimension exists, because equating an hour of sewing to an hour of hammering appears just as incomprehensible as comparing a shirt to a horseshoe nailed to a horse’s hoof following the shoeing of a horse. Sraffa’s perfected Ricardian solution, which we will become more familiar with below, basically consists of making various forms of labour comparable through wage rates. Differences in wage rates are based in part on movements between employments but largely on convention and are not delved into more deeply. The ‘same labour’ then succumbed to a gradual historical change, and the modified relative prices similarly changed again and again – we will see more precisely how – as a result of technology and distribution. An ‘invariable measure of value’ (or, as Sraffa calls it, ‘standard’) can then be defined, but this measure is valid only for the average period which is long enough to make it possible to establish averages with fluctuating market prices and short enough that changes of distribution, wage rates, and production conditions can be disregarded. The equation derived below (20)

must be interpreted in this light. To that extent, only a 'weak homogeneity' of labour is postulated (Schefold 1989a, pp. 314–23). This procedure presents a certain analogy to our chess example or even to the triangle surfaces in the Marxian comparison, although, due to changes over time, a difficulty naturally arises, as if the triangles gradually moved and the surface units themselves were variable.

In Marx, conversely, the term postulated for abstract labour is supposed to form the basis for the comparison. It is made concrete through the development of equivalent, unskilled labour. The difficulty in this does not lie in understanding that complex labour arises from simple labour by training, which also leads to capital costs, the expenditure of which justifies different wage rates; the difficulty, instead, lies in determining when 'equivalent' labour can even be spoken of, since sewing and hammering represent two very different physical activities, which are, in addition, frequently divided along gender lines. How much Marx was committed to the creation of concepts analogous to those of the natural sciences and a corresponding criterion of truth in the solution of this puzzle can be gathered from his attempt to vouch for the homogeneity of the commodity labour-power by measuring the intensity of the expenditure of labour-power through the expenditure of 'muscles and brains.' He quotes Grove:

The amount of labour which a man had undergone in the course of 24 hours might be approximately arrived at by an examination of the chemical changes which had taken place in his body, changed forms in matter indicating the anterior exercise of dynamic force.

(Marx 1887, ch. 17, section 3; citation from
Grove 1978, p. 260)

For him it also follows, for example, that 'the more intense working-day of one nation would be represented by a greater sum of money than would the less intense day of another nation' (Marx 1887, section 2, p. 259). That would be what I have called the physiologically based 'strong' homogeneity of labour (Schefold 1989a, ch. III.4a).

Marx certainly did not find many readers who were prepared to follow him in his postulate of a scientifically based 'strong' homogeneity of labour. Weak homogeneity, however, suffices for the relevant applications, and that appears to me to be the case as well in the application to the theory of forms. I will illustrate this with several citations. In the original version (see earlier in this section) of *Capital*, Marx argued as follows about the 'relative form of value': 'It is apt to be forgotten that the magnitudes of different things can be compared quantitatively, only when those magnitudes are expressed in terms of the same unit' (Marx 1887, ch. 1, section 2,1; p. 20). Unity, however, can suggest two different things: a common dimension which is required for each comparison and a unit of measurement for it as well. The differences lie here because the measure can be based on a natural unit, as with the mass on the choice of a type of elementary particle – the unit is then universal – or on a conventional one, which may perhaps change according to the conditions and is therefore not

reliable (this was Ricardo's concern). We have decided to take up weak homogeneity and must therefore also assume that the conditions under which weak homogeneity develops are stable enough to be able to speak of labour value.

In contrast, Marx continues, with the 'equivalent form' there is no quantitative determination. Its peculiarity is: 'use value becomes the form of manifestation, the phenomenal form of its opposite, value' (ibid., ch. 1, section 3,3, p. 23). Becker took exception to the logic of this formula, but here it is accepted. Marx illustrates the phenomenon by weighing a sugar loaf against pieces of iron, which at a particular number become a 'manifestation of weight' (ibid., p. 23), specifically that of the sugar loaf. And thus 'concrete useful kinds of labour [...] rank now as so many different forms of the realisation, or manifestation, of undifferentiated human labour.' Therefore, the explanation of the equivalence of various use-values through labour finally becomes possible through the explanation of the equivalence of the activities which bring them about. Equal quantities of simple unskilled labour represent each other mutually. Complicated skilled labour is a multiple of simple labour, and the quantitative determination, as well as the possibility of mutual representation, is passed on to the commodities.

The establishment of equivalence in so-called subjective theory of value is different: the logic of decision-making and preferences makes it possible for Neoclassical Theory to derive relative prices in general equilibriums for exchange economies and, when production functions are added to this, also relative wage rates for various forms of labour. Since competing approaches to the explanation of value exist, they are not logically necessary but rather represent alternatives, perhaps complementary hypotheses or theories which must prove to be useful.

We will continue with the objective theory of value approach, in a more modern form, in the central part of this essay, in order to establish where it is useful. Before that, however, we want to look at the conclusions which Marx believed he could here draw. He traced the failure to perceive the contexts, first discovered by him, back to the blindness of commodity-producing societies; he concedes, however, with Aristotle's insights.

The original edition of *Capital* contains the same acknowledgement, with the same justification – that Aristotle was a forerunner of value form analysis – as in the later fourth edition. Naturally, he remained unaware of the cause of the equivalence, the social substance (ibid., p. 31) of the 'equivalent form,' of 'human labour.' And this served to confirm the 'fetishism of commodities' (ibid., p. 31) for Marx; the 'definite social relation between men' assumes 'the fantastic form of a relation between things' (ibid., p. 31), as in the 'mist-enveloped regions of the religious world' (ibid., p. 31). The material form of relationships between the producers (the immaterial exchange-value of commodity A is given expression in a material one, the use-value of commodity B) conceals the personal relationships, and instead of looking these in the eye, the commodity owners hold fast to the general equivalent, to Mammon. Marx thus assumes that the real connections among the products of labour are not recognized. True, the commodity owners will know only too well that production was arduous. Nevertheless, they do not recognize the social basis of the value relationships. Or, better: they fail to perceive

that where they see the value in things, they should instead see behind this the social conditions of production and further formation of value through labour. Even Aristotle here met with a knowledge limitation, due to the particular pre-capitalist form of production of his time. Commodity owners also remain trapped within modern bourgeois society.

Shall we follow Marx in this? Wouldn't even our superstitious Medieval peasant who exchanged his hut for silver coins, a horse, and flour be aware that he could have received more for a hut built with greater care, but that he could also have received more if he had managed to make the buyer more keen on buying or if he had found a richer, more generous purchaser – a miller, for example, for whom it would not have been difficult to add a bit more flour to the price? The peasant would know, even without having a language for it, that the exchange-value of his hut was dependent upon many things, and he would have known only too well the effort that went into a hut's construction. Isn't Marx close to turning the peasant into a fool by accusing him of not knowing his labour theory of value and allowing himself to be blinded by the reflection of exchange-values in use-values? Economic logic is not necessarily connected to theoretical terminology. If, however, we argue theoretically: what becomes of fetishism if labour theory of value turns out to be wrong – or not entirely right – and other bases for establishing value become possible? In sociological terms: is commodity fetishism, to the extent that the phenomenon exists in society, in point of fact merely the blind projection of exchange-value onto use-value and not more an expression of older greed (more use-value is desired than necessary), of chrematistics (exchange-value is desired for its purchasing power), and of liquidity preference (those commodities which represent liquid wealth, thanks to their particular marketability, are particularly desirable)?

Marx is seductive when he promises readers they will obtain a single, correct consciousness through understanding the theory which vain capitalists or those trapped in the fog of earlier centuries cannot possess. The matter-of-fact opposition of modern theory consists, as far as behavioural analysis is concerned, in models which as a rule presuppose rationality, thus, in order to remain with our example, to assume an informed peasant who considers which portion of his assets he wants to keep in coins, which in goods that can be exchanged, and which he wants in the form of goods which serve production. Such a peasant can see through the obscurity of commodity fetishism. Embedding the model in assumed social circumstances – thus ideal types, which point out and exaggerate aspects of reality, and through which a dialectical schema is followed in a different way because, for the most part, one works with many ideal types – aids in estimating the historical impact of the forces. For example rational behaviour, say, is made the thesis, so to speak, and fetishism its antithesis. With the second approach, it is possible to move somewhat closer to Marx and obtain a metalist model for the emergence of money (a use-value becomes the bearer of an exchange-value) at the analytical level and, simultaneously, the ideal type of a commodity-producing society whose members cannot see through the realm of exchange at the historical-theoretical research level. However, other ideal types,

like an entire society of intelligent owners of commodities, can also be imagined, and each of them might claim a certain validity, right up to the Asian image of the monarch who presents his subjects with the charitable institution of circulating coins planned in advance. Thus, one may attempt to understand, by means of comparing and combining alternative models and visual types, how real people are guided. If Marx is read critically in this sense, readers will discover in him a great motivator without having any particular policy dictated. We will, therefore, treat the theory of forms neither as nonsense nor as absolute truth, but rather as a tool whose explanatory power with regard to internal coherences must be verified, which has to prove its value with respect to reality, and which provides limited but valuable explanatory power.

The coherence of the work

The first volume presents a unique, if disputed, foundation for the theory of value and money, based upon an analysis of the value form that is Marx's own.⁵⁰ He constructs a conceptual framework that enables the distribution of wages and profits to be analysed as the outcome of a process of exploitation. Specific aspects of historical and institutional transformation within capitalist development are selected, labelled as the 'production of absolute surplus value' and the 'production of relative surplus value', illustrated by extensive economic historical discussion illuminating the process of economic concentration, so that it can finally be demonstrated that competition has a tendency to diminish and die away, a path into a new economic form then having to be found.

This first volume has been the prime object of attention for a very long time, buttressed by the fact that Marx perfected and then subsequently revised it himself. This volume might therefore appear to be foundation of a planned *Gesamtwerk*, offering the key to an understanding of the capitalist phenomenal world. Marx himself believed this, thinking its implications to be compelling, so that, given the foundation he had provided, the second and third volumes could just as well be written by others.⁵¹ The second volume added the theory of the circulation of capital and the theory of sectoral development, so that the stage was set for the third volume to present conclusions: while capital was always invested where the greatest return on an advance could be made, leading necessarily to the formation of a uniform rate of profit, and although for this reason the relative prices of production deviated from relative labour values, total profit could nevertheless be conceived as a redistribution of total surplus value. Total profit could therefore be explained by exploitation, although the transformation of variable capital into wages and labour values into production prices concealed this origin. Furthermore, the introduction of technical change into the process of production allowed the *entrepreneur* to produce a greater volume for a given price and so either sell a greater amount at a lower price or make a greater profit at the original price; hence, the general advantage of saving on the employment of capital or of labour. However, there is a built-in tendency in Marx's theory of the production of relative surplus value to risk ever-greater advances of capital to reduce

progressively the employment of labour power, in order to reduce the obstructive and troublesome element in the exploitation process. Hence, if the rate of surplus value cannot be increased as the organic composition of capital increases, the rate of profit must fall.

The transition to a system of prices in the third volume could thus be conceived by Marx as a change in form that left materially unaltered the original conception expressed as value-relationships between general economic entities, and so for him there was a genuine and functioning chain of reasoning that led from what in Volume I had been presented as the core of the capitalist process to its emergence in Volume III in the world of phenomenal appearance. This accounts for Marx's astonishingly relaxed attitude towards the unfinished drafts for the second and third volumes; as far as he was concerned, the design of the work as a whole was all there in the first volume, and it was necessary only to *elaborate* (*entwickeln*).⁵²

We know today that Marx was wrong about the crucial point of this elaboration: the transformation of values into prices cannot be effected sufficiently rigorously to demonstrate that profit can be represented legitimately and generally as redistributed surplus value. Of course, that does not mean that the Marxian derivation fails in all respects. If a mistake is found somewhere in a proof, it might mean that the conclusion has only to be revised, while some of the valid argumentative steps remain in themselves theoretically interesting. Establishing the existence of such a mistake is therefore only the beginning of a critique and not its conclusion, although it must be said that as a consequence, the original integrity of the work is shattered.

This introduction will present once more the basic problems raised by the theory of value and prices and relate these to recent discussion in the history of economics. Whether it makes any methodological sense to set up an analytical movement from a value-oriented 'core theory' to the price-theoretical analysis of capitalist development is thus more or less dealt with; the theoretical analysis of prices needs no such foundation. Nevertheless, we need to see how those theoretical aspects of Marx's insights which remain of relevance today can be subsumed by a more modern perspective. If we succeed in showing this, then it becomes possible to illuminate other sections of the third volume – specifically, the theory of interest developed from the theory of profit, the theory of crisis based on the principle of the falling rate of profit, the theory of economic cycles, and finally the theory of differential rent formulated on the basis of the theory of value and price. In my opinion, there has been up to the present day no thoroughly satisfactory account of Marx's doctrine of the value form as connecting the three volumes; by contrast, the present state of debate on the third volume of *Capital* is, for instance, well represented by the collection of essays edited by Riccardo Bellofiore (1998).

While it is not so difficult to trace the historical impact of the Marxian ideas, using the question of the origins of Marx's construction leads into a far more diffuse investigation that can here only be sketched out. Marx presented a very rich but still incomplete interpretation of the prehistory of his theory in *Theories of Surplus Value*. This was governed by one central question – a question which

was at the time unprecedented and which has since found few imitators. *Theories of Surplus Value* provides only the genesis of Marx's theory of surplus value and not the prehistory of all elements of his economics. For example, he only deals in passing with the history of the Scholastic theory of interest and neglects entirely the history of the idea of technical progress or the history of agricultural economy, despite the fact that predecessors in these domains – Charles Babbage, for instance – can be found in *Capital*, vol. I.

It is safe to assume that the problematic of the transformation of values into prices should also show up in this history of theories of surplus value. Marx did in fact accuse Adam Smith of ambiguity: on one hand, proposing a conception of profit originating in the surplus value identified by a labour theory of value and, on the other, anticipating the formulation of so-called vulgar economics, in which profit is a simple premium. As we shall see, the history of modern theory can overcome this alleged internal contradiction in Smith by a reinterpretation assisted by an alternative theory of prices. Likewise, a reading of David Ricardo with price theory in mind suggests that his approach was different to that which Marx imputed to him. Smith, Ricardo, and Marx do share a common point of departure in positing a simple society without capital accumulation, in which exchange is governed by labour inputs, although it can be questioned how far all three thought of this as an abstract model and how far they really believed, as did Engels, that societies founded upon simple commodity production had really existed prior to the accumulation of capital. But Ricardo, unlike Marx, no longer thought in labour values, once discussing the accumulation of capital. Natural price was for Ricardo only approximately equal to the labour embodied in commodities; he sought to calculate the deviation of relative prices from relative labour values (as Marx called them) that was brought about by the rate of interest, together with the time it took to bring a commodity to market.

Given the extent of Marx's reading, we can only deal selectively with the diverse historical origins of his theory. It would, however, be interesting to trace the complexities of his treatment of interest back to older theories of money and interest, beginning with the Scholastics and ending with debates contemporary with Marx, determining the points of criticism and those where he simply assimilated earlier arguments. It is mainly for want of space that we here approach Marx using the tools of modern theory, presenting only some aspects of the historical context in relation to the later reception of Marx's writing.

This is linked to the fact that the third volume of *Capital* – and especially because of the additions that Engels made to Marx's drafts – touches on quite different areas of economics in the modern sense (micro- and macroeconomics, the theory of money and credit, agricultural economics and economic development, plus [among others] some elements of managerial economics). Moreover, Marx's work has to be linked to several schools of thought. He himself sought above all to give a new direction to Classical Political Economy. But his work also has a complex relationship to contemporary developments, contemporary here meaning the 1860s, when John Stuart Mill was the leading proponent of Classical

economics. The new emergent marginal economics of the 1870s began to appear only after completion of *Capital*, vol. I and remained quite fragmentary until after Marx's death. Marx was only partially aware of the tendency and import of some of these early texts. He criticised them as 'vulgar economics', and he maintained a haughty distance with respect to the German Historical School, although it could well be said today that he was the most prominent exponent of the left wing of the Historical School, if it is acknowledged that all representatives of the school sought to *connect* theory and history, even if with differing emphases and varied success.

The transformation problem

Marx raised the question of the relation of value and price in the first volume of *Capital*.⁵³ In volume II, Engels found himself faced with the problem of 'making something' out of the manuscripts left after Marx's death (Engels 1885, p. XXIII, my transl.). The reception history of volume III thus, to some extent, began before the text was actually published. Consequently, in the introduction to volume III, Engels already responds to the 'literature regarding the puzzle of the relation of the average rate of profit to the law of value' (Böhm-Bawerk 1974, p. 50, my transl.). This introduction provides, therefore, an answer to reviewers who had already taken up the challenge of resolving the transformation problem. This answer is so complex in detail that I will pass directly to the next stage.

It is only recently that it has been recognised that the two analytically most significant contributions to discussion of the transformation problem were written by outsiders. The first of these, the unknown student Wilhelm Mühlpfordt, represented the logic of the formation of production prices as a system of linear equations, first in his doctoral dissertation (Mühlpfordt 1893) and in a subsequent article (Mühlpfordt 1895).⁵⁴ More incisive was the work of the Russian economist Vladimir K. Dmitriev, who formalised the Ricardian theory of price in a work which initially attracted no attention (although Piero Sraffa had a copy in his library). It first became more widely known in the context of the Cambridge debates on the theory of capital, when it was translated into Western languages and prompted its own secondary literature (Dmitriev 1974, 1986; Skourtos 1985; and Schefold 1992a). Besides these two contributions, the transformation problem was discussed intensively in Eugen von Böhm-Bawerk's Seminar, where Rudolf Hilferding, who later developed his own version of the Marxian theory of money and credit, sought to distinguish the Classical Marxist approach from that of Neoclassicism (Hilferding 1904). This followed on from Böhm-Bawerk's virtuoso demonstration that Marx's theory could be countered by a finished Neoclassical theory of interest and profit founded upon the distribution of criteria of justice and efficiency, an approach which, though still controversial, is expounded in microeconomics lectures all over the world.

The most consequential contribution came from the statistician and economist Ladislaus von Bortkiewicz (1907).⁵⁵ Possibly influenced by the work of Mühlpfordt, he formulated a linear system for three sectors, clearly separating

the calculation of values and prices and presenting a means of transforming values into prices, in the process demonstrating that profit could be made to equal surplus value only by the imposition of arbitrary assumptions. The English-language debate began when this article was translated into English (Bortkiewicz 1949). In this way, the transformation problem remained closely linked to Marx, there being no real thought of seeking to further elaborate the theory of prices of production.⁵⁶ Around 1930, several mathematical economists began to develop a modern theory of prices of production, an enterprise which can be traced back to Torrens and Ricardo in Classical Economics, and before them to William Petty.⁵⁷ Such approaches did not, however, follow Marx in taking embodied labour as given, but rather the structure of production represented by use values; labour is treated as a direct input in each sector. In Germany, this approach is associated with the names of Robert Remak and John von Neumann; it remains unclear how far they relied upon the work of von Bortkiewicz. However, unpublished work in the Sraffa Archive in Cambridge shows that in 1943, Sraffa, who formalised the theory of prices of production which is accepted today, subjected Bortkiewicz's work to a thorough critical assessment (Gehrke and Kurz 2006).

Piero Sraffa first emerged in 1925 and 1926 as a critic of Marshallian Neoclassicism, his second article presenting the most important European contribution to the development of the theory of imperfect competition (Sraffa 1925, 1926).⁵⁸ In the first article, he showed that Marshall's *ceteris paribus* approach to price formation under conditions of perfect competition, together with the Neoclassical conception of factors, was for the most part workable only if constant returns were assumed, prices being related to cost per piece, including a normal profit. At that time, this was also the way that natural prices in the Classical approach of Smith and Ricardo were dealt with. In fact, well before 1930, Sraffa developed the basic elements of a theory of production prices based upon the structure of use values and a given structure of distribution but did not publish it; instead, he decided to devote his efforts to editing Ricardo's works and correspondence, an enterprise which first saw the light of day many years later (Sraffa and Dobb 1951–73), but which set new and demanding standards for the editing of older economic texts. It was for this reason that his theory of production prices was first published in 1960 (Sraffa 1960). Sraffa's introduction to Ricardo's *Works and Correspondence* (Sraffa 1966a, pp. XIII–LXII) had a significant and direct international impact upon the discussion of Marx's writings, as well as having an indirect impact through the writings of Joan Robinson.

During the Second World War, Robinson, dissatisfied with a Neoclassical Theory with whose limits even John Maynard Keynes had only partially broken, turned to a study of Marx's writings and *Capital*, vol. III, in particular (Robinson 1942). Placed as she was between academic economics in Cambridge and leftist political tendencies in England, she sought an objective interpretation of his texts. Her aim was to elaborate Marx's contribution to understanding of capitalist development and, in so doing, translate his conceptual apparatus into a modern form. The result of her endeavours was her theory of the accumulation

of capital, one of the most important contributions to Keynesian growth theory (Robinson 1956).

Hence, the most important and consequential discussion of the third volume of *Capital* in the second half of the twentieth century started from the work of Sraffa and Robinson. It is for this reason that we seek to develop an analytical reconstruction of their founding ideas, for however widely Marx's ideas were discussed in this period – notable here are those writings of the Frankfurt School that touch on economic matters – this discussion did little to develop the ideas already contained in the third volume.

Joan Robinson encountered various ambiguities and deficiencies in Marx's conceptual structure, such as a failure to properly distinguish the total stock of capital from the sum of its annual consumption (the concept 'constant capital' denoted the latter, but in respect of the context in which Marx used the term, it was often the stock of capital that was required). Correspondingly, Marx used the term 'variable capital' to denote the periodic payment of wages, but sometimes he introduced the wage fund as a whole, which had to be retained over several periods. By making clarifications of this kind, Robinson modernised Marx's theory of accumulation and hence created an opening for the post-war development of growth theory. In an introduction to a new edition of her 1942 essay, which drew heavily on Sraffa's introduction to Ricardo's works, she went more directly to the point (Robinson 1966a). Sraffa had identified in Ricardo's correspondence the elements of a corn model, and it is now evident that one version or another of this was employed by a great number of economists during the classical period (Skourtos 1991).⁵⁹

The model is as follows. In a closed economy, a corn output is produced by means of a corn input. Corn is thus both the product and the input to production, serving as seed, as well as food for the worker. It is then apparent that depending on the quality of land, a particular quantity of corn is required to produce one unit of corn as output, assuming given techniques of production for each piece of land. Hence, for each unit of corn produced there is a specific quantity of seed needed and a specific quantity of labour, and the payment made to the worker is also formed of corn, as a subsistence wage. If there is surplus population, employment and thus the cultivated area are dictated by the capital advance in seed and the wage fund, and for each piece of cultivated land there is an annual excess in the degree of difference between input and output of seed and wages. This excess diminishes as the quality of the land deteriorates. The last section of cultivated land is taken into cultivation only on occasion, so the rent paid on this piece of land by farmers to landowners tends to zero. The surplus yielded from this last piece of land is, according to Ricardian theory, the profit. The relation of this profit to the capital required to generate it is the rate of profit which the cultivator can also expect from the better land; he would otherwise move on. The additional remaining surplus from the better-quality land becomes the rent paid to the landowner.

This Ricardian model contains the core of the Classical Theory of distribution. It is open to extension: characteristically, the landowner will incline to consumption,

while the worker has to consume, since he receives a subsistence wage which secures survival. The farmer is, by contrast, an entrepreneur who chooses between consumption and accumulation (of savings that are invested); the more they accumulate, the faster the economy grows, and hence a greater fraction of the surplus population is drawn into employment. Ultimately, a sector for the production of luxury goods can be added to the corn sector without altering the logic of distribution and accumulation, provided that luxury goods are purchased exclusively from the corn income that landowners and farmers hold back from consumption, and provided that in this second sector no capital goods are produced. To use Sraffa's (1960) terminology, corn is the sole basic good which enters into its own production and that of other goods, while luxury goods are not basic goods, for while they might enter into the production of other luxury goods (rings of silver that are used in the manufacture of silver chains), they do not enter into the production of corn.

In the corn model, labour and nature are combined in the production process, but the factor contributions are not the sole determinant of incomes once the assumption that all wages are subsistence wages is relaxed. On the marginal land, where the surplus over the seed corn employed is necessarily divided into profit and wages, higher wages imply lower profits, and vice versa. The question of the wage level becomes therefore a question of power, and the question of the rhythm of accumulation becomes one of the individual and social dispositions of the investing farmer. Both of these can be influenced by institutions, in particular, through reciprocal effects (investment will be discouraged by wage demands that are too high).

Joan Robinson (1966a, p. viii) noticed that it seemed plausible to assume that these relations did not substantially alter, if further basic sectors were added. This seemed to open up a way of bringing the Marxian and Classical approaches together in a very simple form. So it can be asked why Marx did not himself do so. It is clear that he was familiar with Mill's use of the Classical approach, and *Theories of Surplus Value* contains extensive polemics against this approach – a fact of which few historians of economics are aware. Before proceeding to detail this polemic, we can use the Sraffa model to show how this basic idea can in fact be extended to several sectors, and so how the transformation problem can accordingly be meaningfully formalised. Here it can be said that, to make clear the differences with Marx, the corn model is not obviously suited to an argument that prioritises labour in the creation of value. The corn model can even be compared to Physiocratic thought, where the creation of surplus product is attributed uniquely to nature. Labour is only fed by corn, thanks to which the worker can keep alive, and the reproduction of corn occurs thanks to natural fertility. Ricardo presumed that in the process of accumulation, it was the entrepreneur alone who was of significance.

In each case, interpretation remains distant from the spirit of the Marxian argumentative structure, which supposes that all human activity is objectified in mental and physical labour. Insofar as modern price theory is developed classically from production conditions and not Neoclassically, from the equilibrium of the supply and demand of goods and factors of production, it remains linked to

the structure of use values. This is therefore a generalisation of the corn model, in which prices follow from this value structure, and hence the debate over the transformation problem runs back to a philosophy of the alienation of labour deriving from Hegel, which justifies the starting point of labour values.⁶⁰ But this junction was a fragile one, since price theory did not depend on the labour theory of value, nor was it clear whether the theory of alienation gained anything from this linkage. In any case, Marx himself did not reject Mill's version of the corn model in this manner.

Let us briefly recapitulate the familiar route to Sraffa's formula.⁶¹ First of all, we assume the production of single products. In each industry, one unit of the commodity i that it produces is manufactured with the assistance of commodities a_{i1}, \dots, a_{in} as inputs; the inputs of n sectors of an economy can be brought together into a matrix $\mathbf{A} = (a_{ij})$; (l_i) ; $i = 1, \dots, n$, is the vector of labour inputs. In Marx's sense, this is a matter of simple labour, which we interpret as weekly homogeneous.⁶²

If a uniform rate of profit and a uniform rate of wages have w formed, prices are in a long-run equilibrium defined as

$$(1+r)\mathbf{A}\mathbf{p} + w\mathbf{l} = \mathbf{p}. \quad (1)$$

If $n = 1$, we are dealing with a corn model (only one piece of land that is not completely cultivated, no rent therefore arising from it). In this case, we therefore have only the corn price and the rate of wages. It makes sense here to set the corn price equal to one, so that we get

$$(1+r)a + wl = 1; \quad (2)$$

Here wl is the quantity of corn consumed by the workers, and $1 - wl - a$ is corn production, less the wage costs in corn and less the seed corn, hence the profit ra . If this is to occur, a surplus must result from production; a has to be less than 1. There is an inverse linear relationship between the wage rate and the profit rate, which follows from (2); this takes the form

$$w = (1/l)(1 - a - ra). \quad (3)$$

In (3) the wage rate appears to be determined by the profit rate. If $r = 0$, the entire surplus $1 - a$ goes to the workers. The rate of profit can rise at most to $r = (1/a) - 1$, since at that point wages become zero. An analogous form of reasoning can be developed for the multisectoral model (1). This only makes sense if each good yields a surplus, hence (with \mathbf{E} as the unit matrix) that

$$\mathbf{e}(\mathbf{E} - \mathbf{A}) = \mathbf{s} \geq 0 \quad (4)$$

is valid. Here $\mathbf{e} = (1, \dots, 1)$ is the sum of the unit vectors, and \mathbf{s} is the vector of surpluses; that can assume the values partly of zero (means of production), partly of

one (pure consumer goods), and partly between zero and one (goods which are partly means of production and partly consumer goods). Taking the most simple case, we are in a stationary state. In an economy which is growing, surpluses are also associated with investment goods.

The composition of the surplus is, in Marx, assumed to be given – as with all Classical authors. While he was working on the drafts for the third volume, however, price-dependent demand curves had already been formulated. Cournot (1838) presents them as formulae, while Rau had presented a supply-and-demand diagram (Schefold 1997a), which Gossen (1854) then derived from individual utility. And when Engels finally published the third volume, the Neoclassical writings of Jevons, Menger, Walras, and Marshall were increasingly familiar. It is clear that Marx paid little attention to the contemporary emergence of Neoclassicism (Tubaro 2004). But even some successors of early Neoclassicism, and, of course, Sraffa himself, did not adopt the Neoclassical Theory of demand, since changes in demand which are related only to changes in prices and incomes can only be separated out from the multitude of other factors which influence the demand for consumer goods, if one assumes individual utility maximisation. Even more problematic is the creation of investment functions dependent only on prices and the rate of interest. There is still sense in the idea of a given composition of the final product whose variation in the process of accumulation, disregarding individual preferences, derives from the reciprocal relationship of economic and social factors, since it allows these factors to be separately studied (Schefold 1997b). Here we shall only mention that Ricardo, although close to Utilitarianism from the philosophical point of view, did have reservations in respect of the determination of demand in terms of utility theory, while Smith's clear distinction between luxury goods and necessary goods divided needs into two large groups: the composition of those necessary goods consumed by the worker were determined by physiological need and social custom, whereas the demand for luxury goods altered according to fashion.⁶³

It made sense to assume a given composition of the final product when analysing long-run equilibrium as a foundation for investigating capitalist development. The Classical economists, by contrast, talked of reciprocal actions in prices and quantities when referring to the gravitation of short-term fluctuations in market prices towards prices of production (Schefold 1986). Of course, they did not talk in terms of supply-and-demand curves, even less so in terms of an underlying utilitarian explanation of these curves; Smith assumed an effective demand for each commodity, which at normal prices and below, under normal conditions, had a specific level. If supply *Zufuhr* did not correspond to this, deviating from the normal level on account of accidental conditions, prices rose or fell.⁶⁴ Even Marx considered supply and demand to be 'forces' that were nullified in equilibrium and so could not assist in the determination of the equilibrium price.

Böhm-Bawerk made very clear how little this idea was suited to the critique of the Neoclassical determination of equilibrium through the operation of supply and demand by introducing the example of a balloon, which, oscillating

in height, sought to establish an equilibrium between an upward force (which depended upon air pressure and therefore height) and weight (which was approximately independent of height). The resulting force that brings the balloon to equilibrium is the larger, the further it is removed from the equilibrium level – here there is a parallel with the Classical idea – but this equilibrium level is determined by the very same forces that come into play when the balloon deviates from that level (Böhm-Bawerk 1974, pp. 113–15). This is what happens with supply and demand in the Neoclassical Theory of supply and demand but not in the Classical Theory of gravitation, where the opposite forces that come into play when market price deviates from the natural price are attributed for the most part to the gains and losses on the part of the entrepreneur brought about by these deviations, which particular motivation ceases to have any effect in a condition of equilibrium. This Classical gravitational model has been elaborated in a wide range of very different versions (Caminati 1990). No unified theoretical framework has, however, resulted from these efforts to modernise the Classical gravitational model, and there are only a few points in Marx from which any such effort could start.

Analysis of the equilibrium system represented in (1) and (4) involves two degrees of freedom. As we have already seen in the Corn Model (2), a *numéraire* has to be determined. If prices are divided by the wage rate w , we get so-called prices in labour commanded, $\hat{\mathbf{p}} = \mathbf{p}/w$. Adam Smith favoured this concept, and it can also be found in Marx. If a commodity X and a quantity of labour L exchange at the price p_x , given the wage rate w , if therefore $Xp_x = wL$, then $p_x/w = L/X$. The price of the commodity X in labour commanded is p_x/w , hence equal to the quantity of labour which one can purchase with the commodity X . This underlies Smith's statement that the labour L commanded by commodity X is a measure of the "value" of the commodity. If we write $\mathbf{p}_x/w = \hat{\mathbf{p}}$, equation (1) becomes

$$(1+r)\mathbf{A}\hat{\mathbf{p}} + \mathbf{l} = \hat{\mathbf{p}}. \quad (5)$$

The prices in labour commanded are therefore at a given rates of profit determinate, as can be seen from the formal transformation

$$\hat{\mathbf{p}} = (\mathbf{E} - (1+r)\mathbf{A})^{-1} \mathbf{l}. \quad (6)$$

It is, of course, necessary to prove the existence of this inverse relationship between a zero rate of profit and a positive maximum rate of profit that we have seen in the Corn Model (such that the prices determined by labour commanded have meaning, that is, remain positive). Sraffa found his own mathematical solution to this, avoiding the explicit use of matrix algebra (Schefold 2005a), although he was unaware that the necessary mathematical basis had been established in the early twentieth century by Oskar Perron (1907) and Georg Frobenius (1908, 1909, 1912). The significance of these equations for the interpretation of Classical Theory is most easily seen if the formula given in (5) is inserted in itself and if

this is repeated several times, so that the following series arises, which is valid for values between $r = 0$ and $r = R$, the maximum rate of profit (converging):

$$\begin{aligned}
 \hat{\mathbf{p}} &= \mathbf{1} + (1+r)\mathbf{A}\hat{\mathbf{p}} \\
 &= \mathbf{1} + (1+r)\mathbf{A}[\mathbf{1} + (1+r)\mathbf{A}\hat{\mathbf{p}}] \\
 &= \mathbf{1} + (1+r)\mathbf{A}\mathbf{1} + (1+r)^2\mathbf{A}^2\mathbf{1} + \dots + (1+r)^t\mathbf{A}^t\hat{\mathbf{p}} \\
 &= \mathbf{1} + (1+r)\mathbf{A}\mathbf{1} + (1+r)^2\mathbf{A}^2\mathbf{1} + \dots,
 \end{aligned} \tag{7}$$

since $(1+r)^t\mathbf{A}^t\hat{\mathbf{p}}$ tends for $r < R$ and large t towards zero. The vectors $\mathbf{A}^t\mathbf{1}$ in this formula indicate, as one can show, the share of labour in each industry which is used t periods earlier than ‘today’ and which is embodied in the surplus of “today“ at $t = 0$. (Production takes place in periods whose duration is unimportant but which have to be defined.)

During the capitalist process of development, the composition of the final product slowly alters, as do the processes of production. Before these modifications can be discussed, it is worth considering on theoretical grounds a different kind of change – that of distribution. Here one can allow the rate of profit to vary, although in the course of actual capitalist development this rate does not alter a great deal. From (7) it immediately appears that the prices in labour commanded $r < R$ given technique of production $(\mathbf{A}, \mathbf{1})$ rise monotonically with the rate of profit, beginning with $r = 0$, where the prices in labour commanded coincide with labour values \mathbf{u} :

$$\mathbf{u} = (\mathbf{E} - \mathbf{A})^{-1}\mathbf{1} = \mathbf{1} + \mathbf{A}\mathbf{1} + \mathbf{A}^2\mathbf{1} \dots \tag{8}$$

But the prices in labour commanded all tend to infinity if the rate of profit approaches a maximum – where this involves a basic system in which every commodity enters into the production of all others and, therefore, if one price tends to infinity, then all prices must do so. This relationship is evident economically, which means we can move directly to mathematical proof: the higher the rate of profit, the lower the wages of labour, hence the longer the time that has to be worked to acquire a given commodity, hence also the labour time commanded by an individual commodity.

There are, conversely, several ways in which we can establish that prices in labour commanded equal labour values at a zero rate of profit. Rearranging equation (8) gives us

$$\mathbf{u} = \mathbf{1} + \mathbf{A}\mathbf{u}; \tag{9}$$

where the labour value \mathbf{u} is defined as embodied labour plus the labour embodied in means of production $\mathbf{A}\mathbf{u}$. These labour values do, however, also express, commodity by commodity, the quantity of additional employment created with the

production of one more unit of the commodity in question. Labour values are hence employment multipliers u_i , with

$$u_i = \mathbf{e}_i(\mathbf{E} - \mathbf{A})^{-1}\mathbf{l}, \quad (10)$$

where \mathbf{e}_i represents the i -th unit vector. Consequently \mathbf{e}_i can be conceived as a surplus of the system in proportion \mathbf{q}_i , with

$$\mathbf{q}_i(\mathbf{E} - \mathbf{A})^{-1} = \mathbf{e}_i, \quad (11)$$

so that

$$\mathbf{q}_i \mathbf{l} = u_i \quad (12)$$

holds. What Sraffa called the i -th subsystem requires for the production of one unit of the commodity i just so much labour as is given by the labour value. Hence the labour value of a commodity indicates the amount of increased employment brought about by the production of an additional unit of the same commodity, since gross production and employment in a given system and the gross production and employment of a subsystem are increased. But labour values can ultimately be interpreted by also going back to equation (8). Then labour values are equal to the sum of labour which enters indirectly into the production of a present surplus product in diverse previous periods of production.

The development presented in (7) is called the reduction to dated quantities of labour. This has played an important role in the history of economics ever since Adam Smith. His theory of natural price rested on the adding-up of elements of cost; in a model with circulating capital this would involve raw material costs, wage costs, normal profits, and the cost of land. For this, he needed a theory of the natural remuneration of labour, capital, and land. For labour, he could make use of the then generally accepted theory of subsistence wages, a theory which he deployed in a range of different ways. As far as the rate of profit was concerned, he favoured the idea that it was a given for each individual entrepreneur, gradually falling with the progress of competition. Rent he treated as a form of monopoly profit – its level was determined by the principal crop of a given region. Price seemed therefore to be the sum of its parts.

We can outline the difficulties of explaining price only through summing its constituent parts. As regards rent, the most important element, the theory of differential rent, is missing, a theory which, apart from some early anticipations, became known only in the course of the Corn Law debates.⁶⁵ But Smith was struggling with a different problem. His definition must have seemed circular to him, since the prices of the final products of one industry are influenced by the prices of the final products of other industries which are used as raw materials in the first. He therefore struck upon the idea of tracing the price of inputs back to their costs of production, composed of the natural prices of those

factors used in the production of raw materials and the raw materials from a previous stage of production. Hence, he suggested a verbal form of the reduction represented by (7), without including rent. Smith did believe that this recursive movement could be broken off after a finite number of steps, since, for example, the quantity of steel used before t periods and which today is an input to the production of, for example, coal, is very small if the input lies many periods back, t in this case being large.

But if a serial development of the kind represented by (7) is broken off after a finite number of steps, it is no longer evident that there is an upper limit to the rate of profit. This was exactly what Smith assumed when he thought that the natural price could, under all circumstances, be derived from the sum of its component parts, which in turn derived from the natural prices for labour, land, and capital. Here w and r can increase simultaneously, and there is no direct way of establishing why workers and capitalists cannot both receive a higher income. Marx considered that Smith had here broken with the theory of surplus value. Today, thanks to the formulation of equation (7), we can see more clearly where the problem lies: if the series does not terminate, then, while the material inputs of earlier stages do tend to become smaller, but the powers of $1 + r$ increase with r , so that mathematically speaking, the series in (7) diverge as the rate of profit nears its maximum.

The maximum rate of profit is therefore a coded expression for what is, quantitatively speaking, perhaps the most important statement of the theory of surplus value: with a given technology, higher profits imply lower wages and vice versa, which can here be represented more exactly with an inverse relationship between the profit rate and the wage rate. Sraffa never failed to emphasise that Marx was the first to discover the maximum rate of profit (Sraffa 1960, p. 94). But before we proceed to elaborate the inverse relationship between the rates of wages and profit, we should note that it would also be unjust to accuse Smith of immanent contradictions. If the series terminates after a finite number of steps, it means that capital is not available at every step. What then happens can most easily be envisaged if we assume a production process in which wages are advanced but that besides this advance there is no capital, so that prices in labour commanded are expressed as

$$\hat{\mathbf{p}} = (1 + r)\mathbf{l}. \quad (13)$$

Here the rate of profit can certainly approach infinity, but then prices in labour commanded rise beyond any feasible boundary. It means that a worker has to work ever longer to acquire a given quantity of commodities; the inverse relationship between the real rate of wages and the rate of profit is quite evident. Marx thought that Smith had allowed himself to become drawn into an irrelevance when he moved from measuring according to labour values to measuring by labour commanded. But Smith had correctly specified prices according to their component parts and expressed prices even in labour commanded as a possible measure that might not be ideal for the expression of the contrary movement of the rate of profit and the rate of real wages, but which nonetheless does involve this relationship (Cartelier 1976) and is suitable for other purposes.

We can now obtain the inverse relationship of the wage and profit rates, Sraffa's standard commodity and Marx's average industry, from a transformation that deviates a little from one I have previously suggested (Schefold 1989a). We proceed from a situation in which the entire product falls to the worker, as given in equation (9). We assume that the wage rate, which is in (9) equal to 1, is reduced a little and that consequently a positive rate of profit arises, without us, however, knowing which reduction of the wage rate corresponds to which increase of the profit rate. If exchange relations remain unaltered, surpluses emerge in some industries and deficits in others, which, written as vector \mathbf{y} , result in the following equations:

$$\mathbf{u} + \mathbf{y} = \mathbf{w}\mathbf{l} + (1+r)\mathbf{A}\mathbf{u}. \quad (14)$$

It is immediately apparent that capital-intensive industries lose in this transformation, while the labour-intensive industries gain; that therefore the components of \mathbf{y} must be positive in the capital-intensive industries and negative in the labour-intensive industries. This is because in the capital-intensive industries, the increase of the rate of profit involves a comparatively significant increase of costs, and the reduction of the rate of wages a relatively minor reduction in costs, so that given an unchanged selling price, a loss arises expressed by \mathbf{y} – and *vice versa* in the labour-intensive industries. If it were now possible to sell products at the prices $\mathbf{z} = \mathbf{u} + \mathbf{y}$, costs would equal the selling price, but then we would not have a long-term equilibrium, since input and output prices would differ. These kind of temporary equilibria arise in the intertemporal version of the theory of general equilibrium. Quite how a long-term equilibrium is achieved will not be examined here (Schefold 1997c), but we will instead consider an explanation for the deviation of prices from values as in Marx. We can speak here of an average industry with \mathbf{x} proportions, if the components of this row vector give the levels of production of the individual industries, and the levels of production are selected such that for this average the surpluses and deficits sum to zero. For \mathbf{x} , therefore, $\mathbf{x}\mathbf{y} = \mathbf{0}$. This average would correspond to an aggregate capital intensity of $\mathbf{x}\mathbf{A}\mathbf{u}/\mathbf{x}\mathbf{l}$, and for one industry (either an average industry or an industry group) with this capital intensity, costs would remain unchanged if distribution were altered, such that this average industry could continue to sell at values.

But we can now see that here the concept of average industry lacks precision. We have still not determined which increase in the rate of profit corresponds to a decrease in the wage rate and to which different vectors \mathbf{y} which different vectors \mathbf{x} will correspond.

To find such a criterion, one can, as I have shown elsewhere, formally differentiate the price equation (1), for which no *numéraire* has been given, with respect to the profit rate, so that the prices $\mathbf{p}(r)$ and the wage rate $w(r)$ can each be viewed as functions of the profit rate, with derivatives $\mathbf{p}'(r)$ and $w'(r)$. This vector $\mathbf{p}'(r)$ can be developed serially as in (7), showing that if one wishes to establish how costs change when the profit rates rises and wages fall, it is not only a matter of the

capital intensity in the current period, but also a matter of the capital intensities in the preceding periods.

The capital intensities of indirect production attributable to previous periods can be stated as

$$\mathbf{x}\mathbf{A}^{t+1}\mathbf{u} / \mathbf{x}\mathbf{A}^t\mathbf{1}, \quad (15)$$

and the average industry can be defined as one in which all these ‘indirect’ capital intensities are equal. The infinite series of equations can only be realised if \mathbf{x} is a left-side eigenvector of matrix \mathbf{A} . At the maximum rate of profit

$$(1+R)\mathbf{A}\mathbf{p} = \mathbf{p}. \quad (16)$$

Hence, because of the uniqueness of the Frobenius eigenvector of a non-negative irreducible (basic system!) matrix, this can be written as

$$(1+R)\mathbf{q}\mathbf{A} = \mathbf{q} \quad (17)$$

so that with $\mathbf{x} = \mathbf{q}$ the infinite series (15) is realisable. This average industry, more rigorously defined than by Marx, is the one for which the underlying cause for prices to alter with distribution – more particularly, why prices have to deviate from labour values – is *absent*. This average is what Sraffa calls the standard industry, and its product, more exactly its net product $\mathbf{q}(\mathbf{E} - \mathbf{A})$ standardised by

$$\mathbf{q}\mathbf{l} = 1, \quad (18)$$

is what Sraffa calls the standard commodity and which he makes the *numéraire*. For this commodity, given the definition of the *numéraire*, and using (17) therefore

$$1 = \mathbf{q}(\mathbf{E} - \mathbf{A})\mathbf{p} = r\mathbf{q}\mathbf{A}\mathbf{p} + w\mathbf{q}\mathbf{l} = (r/R)\mathbf{q}(\mathbf{E} - \mathbf{A})\mathbf{p} + w\mathbf{q}\mathbf{l} = r/R + w,$$

and

$$w = 1 - r/R, \quad (19)$$

which is the well-known linear wage curve which links the wage, expressed as a standard commodity, to the rate of profit.

Prices in the standard commodity can be expressed with the expression for the wage rate (19) and taking (7) written as the series

$$\mathbf{p} = w\hat{\mathbf{p}} = \sum_{t=0}^{\infty} (1+r)^t (1-r/R)\mathbf{A}^t\mathbf{l}. \quad (20)$$

The formula (20) represents a special case of the transformation of values into prices, since for $r = 0$ these standard prices are equal to labour values, as can be seen by comparison with (8). The functions

$$f_t(r) = (1+r)^t (1-r/R), \quad (21)$$

take for $r = 0$ the value of one, and for $r = R$ the value zero; between these two they are for larger and larger t first increasing, then decreasing functions, with a clear maximum which lies the closer to R , the larger t is (Sraffa 1960, p. 37). Indirect labour inputs made in the remote past, even if the corresponding components $\mathbf{A}^t \mathbf{l}$ of become small, can therefore have a strong influence on price, if r lies close to this maximum.

For Sraffa, this observation was the point of departure for his critique of the Neoclassical concept of capital, a critique which has been developed by many later writers. Quite clearly, the values of goods, including capital goods, depend in a complex manner on the rate of profit according to (20) and (21). For Neoclassical Theory, however, factor prices and especially the rate of profit must in one way or another be explained by the supply of, and demand for, these factors, and it has become apparent that the dependency of capital on the rate of profit in all known Neoclassical Theories runs into difficulties in defining the rate of profit or the rate of interest. The theories are quite various, the critique being more obvious in those versions that depend for the representation of equilibrium on the concept of aggregate capital than in those in which capital goods are disaggregated. Following Sraffa's discovery of the paradox of capital, the latter are transformed into stability problems around equilibrium (Schefold 1997c, 2005b). To an extent, this critique represents a distant effect, arrived at by a tortuous path, of the debate prompted by the publication of the third volume of *Capital*.

But the continuation of the debate also has an impact upon the interpretation of Marx. As we have already suggested, Marx sought to show that the transformation of values into prices represented redistributed surplus value once values had been transformed into prices, for the sake of comparability a common *numéraire* being required, and this has often been determined by the condition that the sum of the prices of the gross product has to correspond to its value sum. And so both

$$P = M \quad (22)$$

and

$$K + W + P = C + V + M \quad (23)$$

have to hold (all aggregates, in prices: K capital, W wages, P profits; and in values: C constant capital, V variable capital, M the sum of surplus value). From (22) and (23) there then follows

$$P/(K + W) = M/(C + V), \quad (24)$$

According to this formula, profit is not only recognised as redistributed surplus value, but the profit rate is the same whether measured in prices or in values, so that the conclusions concerning the development of capital that can be drawn from the value analysis of Volumes I and II can be transferred to the analysis of the rate of profit in prices in Volume III.

Before turning to the theory of accumulation, we will show that Marx's transformation of values into prices cannot be generally valid, and to do this, it is

enough to take the special case where $n = 2$. So that we might be precise, we will note only that Marx assumed the wage to be advanced, so that for him, instead of the price system (10 being given, the price system takes the form

$$\mathbf{p}^* = (1+r)[\mathbf{A}\mathbf{p}^* + w^*\mathbf{1}] \quad (25)$$

and the relative prices from (1) and (25) relate as in

$$\mathbf{p}^* = (1+r)\mathbf{p}, w^* = w$$

Modifying (23), the *numéraire* is defined by the condition that the sum of prices is equal to the sum of values, so that

$$\mathbf{e}\mathbf{p}^* = \mathbf{e}\mathbf{u}. \quad (27)$$

holds. The basket of necessary wage goods is given by \mathbf{b} ; hence $\mathbf{s} - \mathbf{b}$ is the surplus product that remains in the hands of the capitalists, and equation (22) transforms into

$$(\mathbf{s} - \mathbf{b})\mathbf{p}^* = (\mathbf{s} - \mathbf{b})\mathbf{u}. \quad (28)$$

In three-dimensional space (it is sufficient for the sake of falsification to use only this special case), the vectors \mathbf{p}^* and \mathbf{u} as in (27) are in a two-dimensional space orthogonal with respect to \mathbf{e} , and at the same time as in (28), because $\mathbf{s} - \mathbf{b}$ and \mathbf{e} are not proportional another hyperplane, so that \mathbf{p}^* and \mathbf{u} both lie in the sub-space common to both hyperplanes and hence must be proportional. From this, it follows that Sraffa's corresponding price vectors, with prices expressed in labour commanded, should be proportional with respect to each other. I have, however, proved in my dissertation that the price vectors in a Sraffian system in the so-called regular case, with n different rates of profit, must represent n linear independent vectors (Scheffold 1971, 1989a). From this, it follows that the Marxian transformation can be valid only if the system is not regular, and that means, as I also showed in my dissertation, that the system, excluding certain exceptional cases, has to be one in which prices are *always* proportional to labour values since, to use Marx's terms, the organic composition of capital is the same in all sectors, or, as in the language of modern economics, because the labour vector $\mathbf{1}$ is exceptionally a right-hand eigenvector of matrix \mathbf{A} . But the fact that the transformation works if labour values are equal to prices is a trivial result.

Despite the criticism of the transformation of values into prices which was raised by the very first reviewers of Volume III and which have gradually become more precisely formulated, Marx's followers were reluctant to distance themselves from the suggestive idea that profit could, after all, in a less rigorous manner, still be treated as redistributed surplus value. The article by E. K. Hunt and Mark Glick (1987, pp. 688–91) provides short accounts of solutions different to the one given here, in particular the 'iterative' solution of Anwar Shaikh and the much anticipated 'new solution' of Gérard Duménil, Alain Lipietz, and Duncan F. Foley.⁶⁶

The analysis of joint production provided a new departure, and we can introduce that here with a brief treatment of fixed capital.

According to Sraffa, Marx was an economist who treated fixed capital as a joint product, treating the machine produced during the year as a joint product alongside the product which the machine had produced. At the same time, Marx assumed a linear depreciation of machinery when calculating in values. This procedure remains valid so long as calculations are made in values and so long as the machine depreciates with constant efficiency – but otherwise not. A simple example is enough to analyse the leading properties of fixed capital and demonstrate this. The price of corn is p . In the first round, a new machine is produced with price m_0 by means of a quantity of corn a_0 and a quantity of labour. In the next round, the first to employ the machine, using a quantity of corn a_1 , labour l_1 , the new machine at price m_0 produces a quantity of corn b_1 ; moreover a one-year-old machine with a price of m_1 is produced. Here joint production takes place. In the following second round using the machine, the quantity of corn b_2 is produced, using a quantity of corn a_2 , a machine one more year older for the price m_1 and a quantity of labour l_2 . The machine no longer appears here as a joint product, since it has physically been used up. From this, we get, if we calculate in wage units or rather in labour commanded, the following equations:

$$\begin{aligned}(1+r)a_0p + l_0 &= m_0 \\ (1+r)(a_1p + m_0) + l_1 &= b_1p_1 + m_1 \\ (1+r)(a_2p + m_1) + l_2 &= b_2p.\end{aligned}\tag{29}$$

To make economic sense, the system has to produce a surplus, which means that $a_0 + a_1 + a_2 < b_1 + b_2$. Under this assumption, the corn price p and the price of the new machine m_0 will, between $r = 0$ and a maximum rate of profit, be positive, as can be seen if the second row is multiplied by $1+r$, and is subtracted from the first row, so that m_1 is eliminated.

Constant efficiency of the machine means that $a_1 = a_2$, $b_1 = b_2$, $l_1 = l_2$. It can then be confirmed that depreciation is linear and that $m_1 = m_0/2$ if $r = 0$. In the first, round one-half of the machine is written off ($m_0/2$), while in the second round it is completely written off (m_1). But despite constant efficiency, progressive depreciation is associated with a positive rate of profit, which is a phenomenon that Marx did not notice. The cause of this might be traced to the fact that with constant efficiency, the amortisation – that is, the change in price of the machine (depreciation) and the financial charge incurred by its use – has to be equal in both rounds of production. From the equation for the first process, we get

$$m_0 - m_1 + rm_0 = b_1p - (1+r)a_1p - l_1\tag{30}$$

and from the equation for the second

$$m_1 + rm_1 = b_2p - (1-r)a_2p - l_2;\tag{31}$$

with constant efficiency, the right-hand sides of (30) and (31) are equal. By setting them as equal, we get

$$m_1 / (m_0 - m_1) = (1 + r), \quad (32)$$

so that the relation of depreciation in the second round increases with respect to that in the first by $(1 + r)$. All of these arguments are also valid for machines which have a longer life and in systems with many machines.

If the efficiency of the machine increases as it runs through use, if then, for instance, $b_2 > b_1, l_1 = l_2, a_1 = a_2$, the price of a machine which is one year older will always be positive, and if its efficiency rises sharply enough (so, for instance, because $b_1 = 0$, which means that it is still being constructed), the value of the old machine will even exceed that of the new machine, depreciation thus becoming negative. In any case, with increasing efficiency in system (29), the price of the old machine will remain positive, for r lying somewhere between zero and the maximum rate of profit.

Decreasing efficiency is unambiguous if $a_2 > a_1, l_2 > l_1, b_1 < b_2$. There might be good economic reasons to employ a machine with a working life of two years for one year only, concentrating on the quantities of labour and corn available in the first round and dispensing entirely with the second round. Depending on the rate of profit, it can be shown that this has advantages if in system (29) there is formally a negative price m_1 . This will be true if the corn price in the 'truncated' system (29) (where the corn produced in the second year and the one-year-older machine are eliminated) is reduced, expressed in labour commanded, which means that the truncation of the last production process is profitable. Living and breathing 'machines', such as horses and slaves, generally display first an increase and then a fall in their efficiency throughout their working life, and exactly when, according to the criteria of profit maximisation, they should be withdrawn from use is determined by profitability in the price system as a whole.

These insights, which can be taken from discussion of the Sraffa system, however formal they might appear, had during the 1970s a very great impact upon the discussion of Marx in Western countries. Machines which in the course of their employment gradually wear out and produce less than they cost produce losses, and in a formal system such as (29) these take the form of negative prices for older machines. Depending on the profile of efficiency and the relative prices in the system as a whole, an older machine can then have a positive price at one rate of profit and a negative price at another. As Sraffa emphasised, a machine can have a negative price at $r = 0$, hence a negative labour value, while at the 'real' rate of profit, of perhaps 8 per cent, it has a positive price.

It can be easily confirmed that negative values of this kind can be interpreted in terms of the labour theory of value, as in one-product systems. We saw above that labour values are employment multipliers. If a machine has a negative labour value, it might seem paradoxical that the production of an additional unit of this machine reduces employment. But this paradox is immediately resolved if, following on from the arguments developed previously, we transfer labour and corn

in system (29) from the second round to the first. If, then, the first process is run at a correspondingly higher level and the second at a lower, a unit of a one-year-old machine appears in the net product as a machine that is no longer needed, and at the same time labour is saved, since the employment of the old machine was inefficient.

Negative labour values thus have their uses as indicators of the inefficient employment of labour in a stationary economy, and this interpretation can be generalised to joint production. Ian Steedman (1975) was the first to show that a system could be constructed in which the labour value of the entire surplus is negative (since negative values predominate at $r = 0$), while at a positive rate of profit all prices can be positive, hence the system is economically admissible and creates a positive total profit. The discovery that negative surplus value could be associated with a positive profit created a furore, since this pushed the idea that profit could be conceived as redistributed surplus value into absurdity. Whoever had studied the transformation problem more closely might have already seen that the price system could not be derived from labour values in the way that Marx had originally envisaged, and there were also technical problems, such as the proper calculation of depreciation. But Steedman's result appeared to be a disturbing paradox.

There were very many attempts to "save" Marx by, for example, arguing that labour values should be defined differently in joint production or, as was suggested by Michio Morishima, the surplus be measured with 'optimal values', corresponding to an efficient choice of technology where $r = 0$.⁶⁷ These 'optimal values' were positive. A positive surplus of the product over the costs in raw materials and wage goods thus had a positive value, showing positive profits. But this construction was unconvincing. On one hand, profit was obviously positive only because there was a positive surplus of goods (in excess of the wage goods) measured in some way or other by means of positive prices and not necessarily in labour values. On the other, profit in no way took the form of redistributed surplus value, of a value whose form only changed. The theory of surplus value was therefore quite redundant, as Eberhard Feess-Dörr (1989) pointed out.⁶⁸ This debate led nowhere, lacking any real historical context.

On the theory of credit and of crises

If no attempt is made at a historical reconstruction, but attention is turned instead to the text itself purged of Engels's additions, it becomes apparent that there is from the first to the third volumes a consistent interweaving in the representation of the capitalist process of the changing forms which value assumes and the structures associated with any one given form. From the analysis of the value form in the first volume is derived a general equivalent and, mediated by historical circumstances, money. This gives rise in turn to the structure of monetary circulation, which leads to the equalisation of quantities and the interrogation of the quantity theory of money (Boffito 1973). The third volume continues the analysis of the value form, values being transformed into prices,

surplus value into profit, and profit into interests and entrepreneurial profit, detailed in forms such as dividends and various forms of rent and extended by Hilferding as ‘founder’s profit’ (*Gründergewinn*).⁶⁹ In the way that Marx presents capitalism as a historical product, there seems to be no complete and final theoretical form which can be represented quantitatively without contradiction. On the contrary, the contradictions of the Marxian ‘elaboration’ generate ever new forms, as we will demonstrate in respect of interest. Many writers seem therefore to believe that they need to represent the transformation from values into prices as a sequential process, and even the theory of the falling rate of profit is treated by some within a sequentially dynamised framework. Sequential analysis does in some respects correspond to Marx’s dialectical development, and it can be used to reproduce Marx’s claims (as in the simultaneous validity of 22 and 23). And yet the price system at a uniform rate of profit must be as capable of coherent formulation as the value system. In a similar way, the declining rate of profit (if it exists) has to be reproducible in the comparison to long-term equilibria. For this reason, we will not go down the route of sequential analysis. Such an approach can be found in Bellefiore’s collection and in essays by Alan Freeman (1998) and Geert Reuten (1998).

The key to an understanding of Marx’s intentions lies in the dialectic of use value and exchange value. I have sought to demonstrate elsewhere the basis for the formation of social norms governing use value reformed within Medieval institutions, following on from a similar process in antiquity (Schefold 1999, pp. 122–44). The guilds had their urbanised models for craft commodities. Merchants determined the categories into which the objects of distant trading would be distributed, as can be seen from Petty’s *Dialogue on Diamonds*. Merchants’ manuals provided instruction at extraordinary length on topics such as how one might distinguish the different products of Lyons silk manufactories from those of Bologna, and this teaching continued within German business economics right into the mid-twentieth century as *Warenkunde*, ‘commodity knowledge.’ At the beginning of the first volume of *Capital*, Marx touches laconically on this declining literature and practice.

The Aristotelian question – why should commodities with different use values be comparable as exchange values? – was simply resolved in the labour theory of value of late antiquity and the Middle Ages. Marx went back to this question, however: while the jacket produced by the tailor has a different use value to the bridle produced by the saddler, why should there be an equivalence between the labours performed, since the labour of the tailor was as different to that of the saddler as were the jacket and the bridle? To argue that both forms of labour could be equalised in abstract form simply shifted the problem, since an equivalence between the two commodities in abstract labour is just as hypothetical as an equivalence between material objects of particular weights. The statement that it is relative quantities of labour, not relative weights, that determine relative values only has any economic meaning if the different kinds of labour are in fact reducible to each other, that ‘the same’ labour is labour of the same intensity, overcoming any restrictions imposed by guilds and embodying *social* (and not subjective) ideas

in respect of equal intensity. This would be a highly questionable assumption, for how could one make sense of the ‘equal intensity’ of digging, on one hand, and sowing, on the other? Marx stood more or less alone in developing this line of argument; those whom he saw as his predecessors – Smith and Ricardo – never talked of abstract labour but instead compared different kinds of labour with one another – Ricardo laid especial emphasis on this – and used relative wage rates as weights without further discussion. During the early phases of industrialisation, it could be plausible to talk in terms of a historical tendency to break down craft production and create uniform labour, but since then, ever newer forms of differentiated concrete labour have emerged, a great variety of new skills and jobs have been created, and it is hard to understand how one might adhere to a conception that labour in the abstract defines the value of commodities.

There is a further difficulty if we go back before the period of industrial capitalism and look for a society based on ‘simple commodity production’, an idea that Engels emphatically defended in his first supplement to the to the third volume of *Capital* (Engels 2003, pp. 329–40). This was intended to preserve the historical significance of labour values, even if an analysis conducted in production prices made their employment quite unnecessary for the understanding of capitalist relations of production. Marx had shared this idea of the historical primacy of values at least for a time. But the idea is contradicted by the fact that pre-capitalist relations were elaborately differentiated and characterised by a strict institutional separation of occupations, so that the idea of like labour translating into like wage labour is more a consequence of capitalist development than its original form. This can be shown with Sraffian price theory, where the model with a general rate of profit on advanced capital (which includes the physical remuneration of different classes of worker) precedes the system of wage labour shown in equation (1):

$$(1 + R)\mathbf{Ap} = \mathbf{p}. \quad (33)$$

Consequently, during the last quarter of the twentieth century, discussion of Marxian economics also distanced itself from a conception of developmental stages founded upon a labour theory of value. There have been a few attempts to construct specific economic theories for pre-capitalist modes of production that are distinct to the theory of capitalism.⁷⁰ None of them makes use of a labour theory of value.

Marx was more successful with his theory of accumulation. In particular, his presentation of the different forms of technical progress has had great influence – in my opinion, especially by its influence on Joseph Schumpeter, although this has not been definitively demonstrated on account of the differences in analytical approach. But here, too, the apparatus of the labour theory of value had first to be jettisoned for this influence to have an effect. When Joan Robinson turned to the law of the falling rate of profit, she ended up calling it a ‘technocrat’s nightmare’. If we retain the previous notation and give the rate of profit as $r = P/K$ – the organic composition of capital measured in prices – $z = K/W$ and the “rate of surplus value” as $m = P/W$, likewise in prices, the ‘technocrat’s nightmare’ occurs,

if, because of uncontrolled technical development, z increases and m remains limited because of the balance of power between capital and labour, and so the rate of profit has to fall:

$$r = P/K = (P/W)/(K/W) = m/z. \quad (34)$$

Robinson objected, however, that there is no particular need for the 'organic composition' z to increase. Technical progress also in fact reduces the price of capital goods, such that the accumulation of their volume that caught Marx's attention has no necessary consequence for the value of capital. But Robinson laid great emphasis upon a second argument: the rate of profit falls with an increasing organic composition only if the rate of surplus value does not also increase. If it remains constant, as the law of the falling rate of profit seems to assume, then wages rise in step with profits. This is a tendency which runs contrary to Marx's theory of immiseration, but one which he did not admit, as Robinson complained. If the wage funds are measured in values, then these do fall with technical progress, concealing the improved situation of the worker and showing once more how a stubborn adherence to Marx's theory of value impedes analytical advance (Robinson 1966a, p. 36).

The theory of growth was later based on 'stylised facts' and assumed that the capital intensity K/L rose with labour productivity, but as labour productivity increased, so did the wage rate w , so that with a constant population the relation $K/W = K/wL$ remained constant, as did the distribution of income, the rate of profit not altering for long periods – a hypothesis that found solid confirmation during the twentieth century and which was during the 1950s and the 1960s explained with the use of both Keynesian and Neoclassical models.

Marx's 'Law of the Tendency of the Rate of Profit to Fall' might not have provided a timely response to growth theory, but he did ask the question. Beyond this, it had the merit of explaining forms of technical progress in a more concrete manner. If there were limits to the production of absolute surplus value, the production of relative surplus value would take the form (in historical sequence) of increased co-operation, improved division of labour, and comprehensive mechanisation. In the first volume, Marx characterised these forms phenomenologically. Here he used inductive arguments, as did the adherents of the Historical School. He reinforced his description with a variety of vivid historical examples which, linked to analytical argument, suggested that the organic composition would increase. The primary aim to save labour was not, as in Neoclassical theory, motivated by rising wages, but by class struggle; innovations helped to discipline workers.

These forms of technical progress relate to process innovations in which commodities are made out of the same quantity of raw materials, but co-operation and the division of labour permit the quantity of living labour employed per unit of produced commodity to fall. Here the organic composition z and the rate of profit (34) do not alter, since, if the wage rate increases in step with productivity, this offsets the reduced employment of labour; the sum of wages paid and

the capital employed remain the same, given constant prices. But labour can be saved indirectly through mechanisation. If, for example, the production of cloth is mechanised, there is no reduction in the quantity of raw material used per unit of the finished cloth. Additional raw materials are needed to construct the machines, and, to this extent, production does become more costly. If sufficient labour is saved, this roundabout production method (to use Böhm-Bawerk's expression) pays off. Formalising this kind of technical progress with the help of modern price theory shows that through mechanisation, the organic composition measured in prices for a given rate of profit does increase, while the maximum rate of profit falls, and also, with a given 'rate of exploitation' m , the actual rate of profit must come under pressure, so that according to the stylised facts, this can remain constant only if other forms of technical progress have a contrary effect (Schefold 1980). It is possible to think of counter-tendencies other than those mentioned by Marx in the third volume, such as saving on raw material, but the principal role is played by the introduction of new goods with a high value.

Volume III thus had a significant influence during the twentieth century on the theory of credit and of the economic cycle – and it is often not that simple to distinguish influence from independent rediscovery in some of the better recent work.⁷¹ The most important intermediary here is probably Michal Kalecki (1954), whose theory of the economic cycle was without any doubt very strongly influenced by the third volume, even if this was not made that obvious. Similar traces can be found in the theory of credit and of crisis advanced by the post-Keynesian Hyman Minsky (1965). In discussion, Minsky often spoke of the inspiration he owed to Marx and sought to clarify to his listeners his direct use of Marx in his own theory; in his books and articles, conversely, such references are difficult to find – not because he might shrink from openly naming his predecessor, but because the great difference between Marxian and modern conceptualisation was difficult to separate clearly from reformulation and rediscovery.

Kalecki's development of the theory of effective demand clearly starts with Marx. His well-known argument, that in conformity with the principle of effective demand the capitalists earn what they spend, while workers spend what they earn (Kaldor 1955/1956), simply reformulates what Marx wrote in chapter 23 of the first volume concerning the relation between accumulation and distribution, a relationship which Kalecki reinforced by modernising the reproduction scheme that he found in volume II. If effective demand increases, the short-term consequence is not only an increase in employment, but also redistribution in favour of capital.

We will not here go into the various attempts to estimate the magnitudes of both effects but will first deal with another relationship – that between distribution and growth. This is linked to Marx's theory, as expounded in volume III, and has recently promoted great interest: it involves the relation between the rate of profit and the rate of interest (Schefold 1998a, 2000a).

Keynes (1973 [1936]) treated interest as compensation for holding this portion of wealth in the most liquid form, in money. Insofar as interest mediates the holding of different amounts of this portion of wealth, no especial source from which

this interest measurably flows can here be identified. By contrast, Marx placed the emphasis on the magnitude of this flow. Ricardo was certain that the rate of interest was regulated by the rate of profit and had, in the long run, necessarily to be equal to it, apart from a differential which compensated for the risk associated with industrial entrepreneurship. Thomas Tooke also thought the payment of credit to industry to be the most important cause in the payment of interest and, on that basis, concluded that interest should be regarded as an element of normal costs and hence linked to the formation of long-term prices.⁷² Here, higher rates of interest did not represent a higher price of liquidity and a reduction in investment and employment (as in Keynes), but a higher rate of interest could, at the same level of employment, bring about a higher rate of profit. Wicksell later adopted this direct relationship and adapted it within his theory of a cumulative process, but Tooke's original idea has recently been taken up again (Pivetti 1991), following a reference made by Sraffa.

A simple closure of price system (1) is conceivable, in which the rates of profit in individual branches of production are forced down through competition, until they cover only the payment of interest to the entrepreneur and a branch-specific premium covering the risks and costs of entrepreneurship considered as given. If interest payments fall, following, for example, an easing of the international capital market, then long-run prices fall relative to money wages, and in this respect real wages rise. This approach presupposes that movements in the rate of interest have no impact upon the profitability of industrial production via changes to investment and employment, which could be the case most clearly in long-run growth. I would attribute another theory of distribution to the circumstance where growth was more rapid, in which increased demand, as in post-Keynesian theory, leads to rising prices because of the limits to the growth of capacity and employment and in this way entails a redistribution between wages and profits. This would be Kalecki's approach. Technical change would also give rise to quasi-rents, which would be the more significant, the higher the rate of growth, and although imitation always eliminates such quasi-rents, new ones are always created and increase the average profit.

The two theories briefly outlined previously can be formalised as:

$$r = i + e \quad (35)$$

in which i is the rate of interest, e the rate of entrepreneurial profit (ignoring branch-specific differences in this), and

$$r = g/s_c, \quad (36)$$

where g is the rate of growth and s_c the propensity to save out of profits (assuming that nothing is saved from wages). Saving from profit per unit of capital is therefore rs_c , g is investment per unit of capital, hence the rate of growth of capital. Savings and investment must be equal at equilibrium, but the causation runs from investment to saving, so that here the rate of profit follows from the rate of growth. The simplicity of these formulae should not be allowed to conceal the

underlying complex theoretical context, which context was the subject of thorough discussion in the last quarter of the twentieth century.⁷³

For the alert reader, the third volume contains elements of all of these theories of the distribution of income, which are at the same time theories of employment, of fluctuations in employment, and of the rate of interest. It is obvious that Marx's point of departure is the given real wage or the given value of labour power. His theory of the declining rate of profit cannot be understood without the assumption of a given distribution of income P/W , which can initially be attributed to a balance of power. But in chapter 23 of the first volume, wages rise when labour power is in short supply, in some circumstances to the point where 'the goad of profit is blunted' (Marx 1987 [1872], p. 567.4). Marx even states that 'the magnitude of accumulation is the independent variable and the magnitude of wages the dependent variable, and not *vice versa*' (Marx 1989 [1883], pp. 583.28–30). Post-Keynesian theory really goes only one step beyond this. The increase of real wages is constrained by growth if increasing demand leads, given flexible prices, to higher profits, and these increased profits permit increased investment; the process is inflationary to the extent that money wages rise faster than productivity.

In the third volume, Marx deals with the payment of interest in the general framework of a division of profit into interest and entrepreneurial profit. To the degree that in Marx the rate of profit is previously given and the rate of interest determined by the supply of and demand for loan capital, entrepreneurial profit is the residual which will be large enough to remunerate the activity of supervising the worker – a function that can be given to managers and which Marx sees in many possible historical forms. But entrepreneurial profit is not exhausted by such 'supervision and management'. Insofar as the rate of profit is not preset and is able to vary inversely with the real wage, the possibility arises that interest will become the determining element, particularly for the enterprise form where the ownership of capital has become clearly separated from 'supervision and management' – the joint-stock company. Here, Marx emphasises what is most important: 'Since profit here purely assumes the form of interest, such enterprises are still viable when they generate only interest, and this is one of the reasons that the falling rate of profit is constrained' (Marx and Engels 2004 [1894], pp. 428.30–4).⁷⁴

Whoever sells a commodity does not give away its value, for this only alters its form; what is sold is the use value. Correspondingly, in Marx the loan of money capital is a sale of its use value, and this consists in the capacity of all capital to create a profit corresponding to the general rate of profit. Marx here adheres to the older theory of interest, which was only successfully superseded by Böhm-Bawerk. As early as in the Bible, the progeny of a herd were divided up. Some fell to the lender by virtue of *lucrum cessans* (and if he kept the herd, he received all offspring), but the borrower also received a share, since he looked after the herd. The *contractus trinus* was capable in early modern times of representing all similar business dealings in terms of shares of a gain, so that any suspicion of usury might be avoided. The first clause of a contract created a partnership, in the second the borrower guaranteed the lender that the capital would be repaid,

and the third clause the yield of the capital was given to the borrower, apart from a fixed sum (the interest).⁷⁵ In this way, the lender sold the use of capital to the borrower. Later, in John Locke and even in Léon Walras, interest was paid for the service that capital facilitated. Böhm-Bawerk, however pointed, out that in the act of being given, the capital itself altered – its price, at least – so that a loan could be seen to be an intertemporal exchange. Interest could therefore be seen as the relation of the current to the future price of a commodity.

Marx would not have accepted such a view and called interest an ‘irrational’ form – in the first place because without any consideration of time there seemed to be a dimension missing:

‘Interest as the price of capital is at root a thoroughly irrational expression. Here a commodity has a double value, first of all as a value, and then a price which is different from this value, while price is the monetary expression of value.’⁷⁶

This Scholastic argument comes straight from the Medieval critique of usury, the sale of the service of capital being distinguished from the loan itself. But this plays a lesser role in Marx than does a second argument: interest conceals its origin in profit, which in turn derives from surplus value. The second argument excludes payment of interest as abstinence from consumption, an approach that can be justified by pointing to the way that Marx focuses on the credit advanced to the entrepreneur.

Here we come to a specific form of the contrast between he who provides credit and he who receives it, the latter playing a more active role as manager of the production process. Marx thought that this role could just as well be transferred to supervisors and delighted in citing the passage in Aristotle’s *Politics* where the citizens of Athens give up the drudgery of supervising the work of their slaves on their estates, so that they might be free to become involved in politics or philosophy (see pp. 375.9–23). This disdain for the entrepreneurial function was not shared by all writers in antiquity.⁷⁷ We can see here that Marx underestimated the business of organisation and assumption of responsibility, an underestimation that had the fateful consequence that his followers likewise underestimated the problems of the administration and development of socialised production. Moreover, Marx seems to disregard the relevant individual economic factors that determine the credit relationship (Brunhoff 1973). Asymmetric information and uncertainty are not considered as means of explaining, for instance, to what level and at what price an entrepreneur should become indebted or a provider of credit make capital available. It could be suggested that Marx was here more interested in the denunciation of a reality than in its explanation.

Marx’s procedure can, however, be defended: following his *definition* of interest, he moves to its determination as a macroeconomic phenomenon in the business cycle. He thought that he had, at a very abstract level, shown that a ‘rational’ theory of interest as a price was impossible, because of the irrationality of the form. Interest could in no way be defined ‘microeconomically’. But even

at the macroeconomic level, interest cannot be deduced from definite, objective data in the same way that the rate of profit can, so long as one knows the given technology and objective value of labour power. In this 'objective' sense, Marx could say of interest only that over the longer term, interest could not exceed the rate of profit.

The rate of interest is subject to cyclical fluctuations, but these fluctuations are to a great extent determined by intangible expectations; they follow in part an apparently paradoxical path counter to that followed by the rate of profit, since in periods of expansion the rate of interest can remain low, despite the existence of high levels of demand for money capital, so long as the optimism of the lender prompts the extension of cheap credit. At the height of a crisis, conversely, an already high rate of interest can unexpectedly climb even further if panic over the availability of credit breaks out. Marx vividly outlined such a constellation of events using historical examples; as the correspondent of an American newspaper, he had for years followed movements of money, capital markets, and crises on a daily basis.

The entire mass of material that Marx piles up in the fifth section of the third volume serves this critical demonstration, but his intention was concealed by the way that Engels retained too much and made it here look as though Marx had wished to incorporate something like an encyclopaedia of credit within the larger book.

Marx's Old Testament wrath led him to underestimate his opponent – or, at any rate, the potential of the ideas which they represented. Norman, then Director of the Bank of England, introduced something like the "own rate of interest" of modern economic theory. Speaking of a commodity (cotton), he said: '... the difference between the ready-money price and the credit price at the time at which he is to pay for it is *the measure of the interest*. Interest would exist if there was no money at all.' Marx commented that Norman's comment was a 'self-satisfied chump [*Kohl*]', a phrase which Engels had toned down, for Marx had in the 1864/65 manuscript written that what Norman said was a 'self-satisfied *Seichbeutelei*,' which 'is quite worthy of this pillar of the Currency principle'.⁷⁸ Marx was of the opposite view: it is the rate of interest that regulates the price difference. He attacked the 'vulgar idea than capital was a "commodity employed in production"'. And he went on: 'If there were no money, there would at any rate be no general rate of interest.'

On behalf of Norman, one could only object that the commodity employed in production was employed as a capital good, and that intertemporal general equilibrium theory for these capital goods at different points in time determined differing prices whose relationships did determine rates of interest. As regards Marx's critique, what remains is the question of whether such arbitrary rates of interest can govern a general rate of interest. It was this question which was central to the debate between Sraffa and Hayek (Schefold 1995b). We know today under certain conditions (excluding capital paradoxes) within general intertemporal equilibrium theory that such a rate of interest forms for long periods, as in the so-called Turnpike Theorems.

But is this modern intertemporal equilibrium theory, to the extent that it can be consistently formulated, of any relevance for the understanding of the business cycle which Marx had in mind? One of the main virtues of the arguments developed in the third volume is to indicate the differing movements of the rates of profit and of interest long before Wicksell's cumulative theory was presented. This permits a focus on the question of the extent to which the accumulation of money capital and of real capital coincide and the extent to which they differ – a question of great contemporary relevance.

Marx moved from money capital to 'fictitious capital', by which he meant securities, and he provides a fascinating account of the manner in which shareholding pushes the process of socialisation. He is especially critical of the related functional problems in the administration and management, attributing them entirely to the business form of such a company, without, however, taking any account of the fact that these problems might re-emerge in aggravated form at even higher levels of socialisation. At every step how one might be able to distinguish between the rational and the irrational aspects of capitalism as it exists in the present remains a problem for Marx and for his readers. He who saw in the shape it assumed in England only irrational developments would have to harbour illusions regarding the supersession of such developments, while, conversely, an economic theory that only admitted a rational account of economic processes necessarily ignores material problems in its functioning, such as credit panics.

Here we owe to Marx some worthwhile distinctions; for example, his critique of the identification, in the course of his discussion of Tooke (1844), of the circulation of income with circulation in general, and the identification of money capital as a means of payment with capital.⁷⁹ For means of circulation can also assume a capital form, while income can be used as a mean of payment. A clearer distinction becomes open to Marx to the extent that he anticipates national income accounting. But he did not succeed equally well in representing the structure of fictitious capital in a finished conceptual form. It seems as though all of the principal components of modern macroeconomics can be found here, especially the post-Keynesian idea of different price levels (Davidson 1972), the reciprocal movement in the prices of commodities and securities, and the idea of the endogeneity of money (Moore 1988). But the forms of credit become confused, and Marx simply shouts, 'Interest-bearing capital is the mother of all crazy forms (*verrückten Formen*).'⁸⁰ Capital seems to double and treble itself because of credit (Marx 1992, pp. 526.9–10), raising the question whether the accumulation of such money capital forms has anything to do with the accumulation of real capital. Here, Marx looks back to Sismondi's 'imaginary capital' as one of his most important inspirations.

Marx draws from the confusing forms of fictitious capital and the paradoxical course of crises the following conclusion:

The ultimate illusion of the capitalist system, *as to capital being the offspring of saving and labour*, here completely goes down the drain. Not only does profit consist in the appropriation of estranged labour, but the capital with which

this estranged labour is exploited consists of ‘estranged’ property which the *monied* capitalist places at the disposal of productive capitalists, exploiting the latter in turn.”⁸¹

National income accounting nonetheless proves that savings in a closed economy without a state sector equal unconsumed income, and that this magnitude in turn corresponds to aggregate investment. But the Keynesian Revolution turned on the issue of what caused this congruence.

The monetary crisis which the downturn accentuates leads to balance of payments problems and an outflow of specie. To prevent this, the rate of interest must be raised; as Marx puts it, real wealth has to be sacrificed to preserve the structure of credit. The credit system had been developed to avoid having to use money in the form of bullion, but a monetary crisis prompts creditors to demand payment in ‘world money’. This is an ‘insane demand’ (*ibid.*, pp. 626.17–18), since the reserves of the Central Bank are only a few million pounds in gold and silver.

For Marx, the abolition of money was one of the criteria for the transition to communism (a transition so far realised nowhere in industrial societies), and he believed that the credit system could never detach itself from a monetary basis in the form of commodity money (bullion): ‘The monetary system is essentially Catholic, while the credit system is Protestant . . . But the credit system has emancipated itself from the foundations of the monetary system as little as Protestantism has emancipated itself from Catholicism’ (Marx and Engels 2004 [1894], pp. 583.13–21). But it is exactly this detachment that the introduction of modern paper money has brought about, a historical event that has given rise to a great deal of discussion. Even such an important disciple as Hilferding held to the Marxist conviction that money had to be fully backed by gold, maintaining this view right up to the 1929 crisis and the dissolution of the gold standard, a process that led to the system of Bretton Woods and ended with its collapse.

We have therefore covered the principle points of later influence in the economic theory developed by Marx in the third volume of *Capital* – not uncritically and not without great admiration for the elegance of its construction. There is much of importance that could not be dealt with – for example, the interesting hypotheses that Marx raised concerning pre-capitalist relations. Likewise, we have not dealt with the work of ‘circuit’ theorists who, starting from Marx’s theory of the circulation of money, develop a modernised theory of monetary circulation linked to modern price theory (Nell 1998). The section on the rent of land, closer to Ricardo and other predecessors than others, also involves Marx’s own particular conception of ‘absolute rent of land’, whose coupling of historical and theoretical argument is of great interest, but this work has found but little echo in the foundations of the modern theory of production prices.

It is quite remarkable and remains something to be explained that the Corn Model and its variants, as used by the Ricardian School, should have been forgotten until Sraffa rediscovered it. Our critical reception of the contributions to economic theory contained in the third volume rest in large part upon this model, together

with Keynesian theory and its various predecessors, especially the Banking School. This is a path of reception that is independent of the fundamentals of neoclassicism and which in no respect treats the parameters of income distribution as factor prices in a full employment general equilibrium. To this extent, one can talk of a modified impact of Marx's basic ideas, which is connected to his critique of the treatment of income from labour, land, and capital as functional equivalents. Such a reception takes up the Marxian critique of the 'Trinitarian formula' and can be understood as a theory of capitalism as a developed economic form – there have been, and might still be, other economic systems, even if such alternatives are not today apparent (Schefold 2004a).

But why did Marx, even if he could not have foreseen modern price theory, reject the Corn Model? He encountered it but then rejected it, because in that model the means of production appear as natural forms, and not as specific elements of a capitalist production process. He was puzzled by the way that a physical surplus (in Ricardo, a surplus of corn; in Torrens, a surplus of several goods in an extended version of the model) could not be related to work performed and the exploitation of such labour. Marx also argued that the entrepreneur had to maintain a reserve in money besides means of production and wages; this was no doubt true, but for many purposes it appears right to begin the construction of production prices in the absence of money, abstracting in the way that Marx himself did and every theoretical economist does.

In the manuscript for *Theories of Surplus Value*, from 1861 to 1863 Marx does, following on from John Stuart Mill, set up a system which produces corn by means of corn (Marx 1977b, pp. 471–87). The key point of his argument is to prove, using value transformations of constant capital, that the rates of wages and of profits do not always have to move inversely.⁸² But we know today that given a constant technology, there is such an inverse relationship; it is expressed in the monotonic decline of the wage curve. Marx missed this point, since his value transformations of constant capital deviated from the clear assumptions of the Corn Model, where product and means of production are homogenous; changes in value did not have to be dealt with. Marx accused Torrens of breaking the rule that the physical increase of goods in a growth process also had to respect the law of the preservation of the total mass of goods (Marx 1979, pp. 1271–2). Here he fails to recognise that the Corn Model and related models involve the reproduction of *commodities*, not real, physical goods for which one would need to take account of the air and all of the other elements.

Marxian value theory in the narrow sense has proved untenable. But its suggestive power and the synthetic role it plays for his work as a whole ensure that it will continue to be studied within the framework of his work as a totality. At present, it is an open question whether those theoretical elements associated with the name of Sraffa will retain their place alongside Marx and neoclassicism as an independent third force, or whether they serve only for the analytical reconstruction of elements of Marxian theory and the specific criticism of Neoclassicism. The search for a synthesis of Sraffa and Keynes, a search which began in order to supersede Marx and which has lasted for decades, is neither complete nor abandoned.

Karl Marx: circulation, productivity, and fixed capital

What is the circulation of capital?

Scholars looked forward eagerly to the publication of volume II/12 in the new *Marx-Engels Gesamtausgabe* (the Collected Works of Marx-Engels – MEGA2), because this new edition promises a new approach to the Marx-Engels problem.⁸³ As will be seen in this essay, the editorial manuscript (Omura 2005, p. 497) provides information on which papers Engels used to compile the second volume of *Capital* and where his own additions, brief remarks, or at least headings created transitions to fashion a completed whole from drafts of various extent and provenance. Texts drafted initially as working notes were turned into an astonishingly coherent book, whose content was presented in an organized fashion.

This essay presents examples of how Engels altered terminology so as to clarify difficult or paradoxical formulations, such as the following: ‘Capital is circulatory insofar as it moves through a cycle successively [. . .]. It is, however, at the same time *fixed* within each of these phases’ (Marx and Engels 2005 [1884/85], p. 513). It cannot be expected that with a simple stroke of the pen, Engels would manage to solve problems Marx had struggled with for decades. But Engels did find ways of clarifying formulations. Today, when dealing with fixed and circulating capital, we have access to the description which was developed concurrently, yet independently, by John von Neumann and Piero Sraffa in the mid-twentieth century with the aid of the joint production approach, and we will deal with this contribution later.

The overall theme is the flow of capital, where economic activity is envisaged as a circulation process, in which the conditions of reproduction for individual capitals (enterprises, we could say), economic sectors, and the economy as a whole always have to be reproduced. Whether the capitalist process should be understood from an evolutionary point of view, whether it is thus believed that the process always begins anew and randomly alters quantitatively and qualitatively, or whether it can be interpreted as a process tending toward equilibrium or whether circulation is more than a simple figure of speech – because development is best explained as a mere gradual modification of a stationary circular process – all remain a subject of debate. In the history of economic thought, Quesnay, Marx, and Leontief have emphasized circulation. The theorists of general equilibrium have described it as convergence to a condition in which expectations will be fulfilled. Schumpeter and Keynes, conversely, have pointed out that technological development or cyclical expectations always generate different conditions. Most economists would have to agree that these points of view complement each other and even that Marx’s *Capital* represents a synthesis whose second volume places the entire emphasis on the regularity of reproduction.

Engels does not appear to have had any fundamental difficulties with this system; the editorial manuscript illustrates how he worked through them individually, in part more logically than Marx himself. If comparisons are made with the *Grundrisse* (Marx 1981 [1937]), it becomes clear that Marx repeatedly

breaks away from the treatment of circulation, returns to it, then follows another path in which capital does not move according to simple laws of circulation. The introduction mentions how Engels introduced the term ‘circulation capital’ as the quintessence of commodity capital and money capital so that it might be possible to jointly contrast them to production capital: a concept that Marx did not use (Marx and Engels 2005 [1884/85], p. 516). Engels also had to standardize terminology when translating a large number of citations; the introduction remarks that the editorial manuscript deviates from Marx’s manuscript in several thousand places, as the list of variants shows, and in the course of printing, Engels undertook still more smoothing and clarifications (*ibid.*, p. 521). The section on ‘Origins and transmission’ in the accompanying critical apparatus, published separately, explains that Engels also altered the numerical examples concerning work period and circulation period. Altogether, he selected materials from fourteen manuscripts (*ibid.*, p. 536). He sought to select variants which were terminologically more finished – possibly at the cost of potentially more creative passages. It does seem that the ‘complete draft’ of manuscript I was of least use to him (*ibid.*). The fact that the existing papers placed limits on his capacity to construct a coherent text is clear from the very important third section of Volume II of *Capital*. The Marxian reproduction schemes, although they have come down to us only in fragments, have always been celebrated as a great analytical advance in the history of economic theory, particularly by Samuelson, as will be later explained.

Unfortunately, I possess neither the necessary competence nor the time to use this edition of volume II to bring us closer to a complete solution of the Marx-Engels problem. This would require careful philological investigation of thousands of variants, to establish whether an interpretive pattern exists with which Engels made sense of Marx’s manuscripts (he certainly had his principles and aims), and to determine how we might characterize such a pattern, whether and to what extent Marx is read consistently in a particular way which deviates from Marx’s own understanding or somehow limits the content. We can only declare that on the face of it, nothing points to an attempt at deliberate distortion, and all of the evidence suggests a determination to remain true to his former friend.

Instead, I will attempt to place the second volume of *Capital* in its historical and historiographical context, using the published editorial manuscript and the accompanying critical essays – less in order to trace the origin of Marx’s ideas than to contribute to a history of reception and evaluation. Given the space available here, this does, of course, demand a degree of selectivity.

Marx defines ‘capitalism’

The framework within which Marx situates his analysis of ‘circulation’ can be explained if we start with the definition of ‘capitalism’, which is given in Volume II of *Capital*, the importance of which I have only become aware of while working with the editorial manuscript. This definition appears to be an isolated usage of the concept ‘capitalism’ in the volumes of *Capital*: ‘For capitalism is entirely

undercut by the bare assumption that the driving motivation is personal consumption, and not enrichment itself (Marx 1971a, p. 123 [Marx and Engels 2005 [1884/85], p. 94]).⁸⁴ Hence, as in the Aristotelian tradition, capitalism is profit for the sake of profit.

As is well known, Aristotle differentiates between two kinds of acquisition, domestic economy and chrematistics. Acquisition in a well-organized household promotes the good life, and the good life struggles for *eudaimonia*, or what we now refer to as 'happiness'. To achieve this, knowledge is needed. The household economy should therefore accumulate objects of wealth as means for the attainment of the good life, as useful commodities – thus as commodities which are not good in and of themselves but are good for something else – insofar as these serve the pursuit of happiness. This form of acquisition has its natural limits, just as a tree does not grow to an arbitrary height but to its natural height. Those who strive to acquire beyond these limits will slave away uselessly and reduce their happiness. Needs are not boundless, but this limit comes from knowledge of what is truly necessary to attain happiness, without any necessity to introduce the disutility of labour and the undervaluing of future consumer goods, given needs which are essentially unlimited, as is assumed in modern economic theory (Schefold 1989b).

The other form of acquisition, chrematistics, has no such aim, other than the accumulation of wealth for its own sake. Aristotle explains its origin as being a confusion of use-value and exchange-value. An object which serves a purpose retains its place in the goals of the household, whereas there is no inherent limit for production for exchange purposes. Occupations are transformed, for example, when doctors think not about healing patients but about their fees, and this tendency becomes generalized because accumulation of exchange values becomes an accumulation of money. Money may have been created in order to ease trade, according to Aristotle, but anyone who pursues exchange value for wealth, and money for exchange value, will accumulate without limits. For Aristotle, chrematistic forms of acquisition include wage labour and the charging of interest. He condemns them, not to prohibit them, but to suggest other paths for the lives of his students of philosophy – young Athenian citizens. He thereby gives new philosophical expression to a Greek tradition, reaching back to Homer: creativity, fighting, thinking, and writing poetry all come before trade in the evaluation of spheres of life. What was once passed on as wisdom through art, religion, and politics, in epics, lyrical poetry, or speeches, is now systematically represented in Socratic philosophy (Schefold 1997f.).

Marx went along with Aristotle to the extent that he even adopted his denunciation of usury as an absurd form. For Aristotle, it makes no sense that money, intended for exchange, produces new money through the charging of interest. For Marx, interest as the price of money makes no sense because money itself exists in order to express prices.⁸⁵ Among the greatest differences between Aristotelianism and Marxism, noted by Max Weber, is, of course, that domestic economy is a natural form of acquisition, and chrematistics is an unnatural form. Both are pursued by *persons* who dedicate themselves to a particular lifestyle, either a good or a bad one.

This is entirely in the spirit of Greek mythology, where again and again a hero stands at a fork in the road and, like Herakles, has to decide in which direction to take his finite life, which life can perhaps be extended only by posthumous fame. In the ancient world, the chrematistic persona was also considered as a member of a household. In the course of the early Modern era, however, economic activity was separated from the household and organised for the unceasing pursuit of profit, while the receipts from such activity flowed to households whose members were raised within the framework provided by religion and custom. Chrematistic acquisition, according to Marx, thus becomes a system-immanent necessity: no entrepreneur can escape the necessity of maximizing profits.

But according to the Austrian School, the barriers to the inclination to accumulation established within the household have an effect on enterprises, because the latter cannot sell more than the former are willing to buy with the money that flows to them. Menger also began with Aristotle (Campagnolo 2004). According to the Austrian School, chrematistics (the search for profits by enterprises) is constrained by the market. The preference for leisure limits the provision of labour by households, time preference their willingness to save, and for Neoclassical economists no amount of profit seeking can overcome the limitation 'pleasure' places on accumulation. Producers cannot sell more than household members are willing to purchase. Consequently, it is not necessary to enforce a philosophically- or culturally inspired reticence, whether this comes from the counsel of ancient philosophers or from the Medieval ecclesiastical prohibition on usury underwritten by the threat of a loss of salvation; rather, it is individual preference or whatever underlies this as a motivation which sets limits to the accumulation of wealth.

Utility theory can in this context be interpreted in such a way that goods directly serve the satisfaction of needs by creating pleasure; however, this Epicurean interpretation is not the only one possible. Preferences could also be understood as the expression of a life organized in terms of more complex objectives – but whether this is open to consistent formulation is another question.⁸⁶

For the Classical economists, of course, consumption and the inclination to save set limits to production, even if they were more flexible. They were the heirs of late-Medieval and Early-Modern extensions of Aristotelianism transmitted through church and confession. Out of an emotional rejection of luxury consumption and the associated efforts to limit and constrain it by statute, there developed a discussion of the economic stimulus provided by strong demand for luxury goods and the associated decline in the propensity to accumulate. 'Necessary goods,' which served to subsist the poor and the worker, were sharply differentiated from 'luxury items' and 'conveniences.' As long as wages did not rise above subsistence level, demand for the basic necessities of life could not rise faster than employment. However, there was now apparent advantage not only in not putting legal limits on the demand for luxury items, but rather of increasing such demand to the point of wastefulness.

These goods were thus socially classified as use values and played various roles in the conception of economic development as well as tax policies, according to

the way in which they were classified. Merchants had to be aware of the various use-values, economic policy promoted handicrafts or manufacturing to benefit cities, regions, and countries. With the rise of liberalism and a more abstract understanding of economics and development, only the most general categories of use-value survived, and use-value remained only as a precondition for the existence of exchange value. Marx was the most resolute advocate of this understanding because for him it seemed to epitomize the essence of capitalist production: the core of the capitalist enrichment process is the exploitation of labour; this, as a pursuit of surplus value rather than 'pleasure,' functions as the 'driving impulse.' But it has to be asked how this can happen if the goods must still find their market? This is a problem of circulation and, hence, of the volume of *Capital* with which we are here dealing.

Before going to the heart of the matter, let me quickly highlight three key issues for Marx which follow from the categories he employs.

1 The capitalist dynamic is primarily one of process innovation; consumer goods (the 'use-values' entering final demand) remain the same. Even the production of absolute surplus value consists in increasing surplus value and production volume in the simplest way possible, namely by extending workers' hours. In the production of relative surplus value, it is then a question of the use of production methods – such as the improvement of cooperation and the division of labour and, on a larger scale, mechanization – which are capable of increasing the production of necessary goods, specifically the means of subsistence for the worker. In this context, new products are only intermediate products, specifically the machines themselves; it can be asked who is supposed to purchase the increased volume of products? In any case, here one of the most important forms of technical progress is left out of account altogether: the introduction of new products hence altered use-values, which come along with changed or in any case modified needs.

2 The idea that capitalism is focused on an often-failing satisfaction of needs is not therefore essentially confirmed by the flow of artificially increasing final demand for yet more goods, but paradoxically in the breakdown brought about by the attempt to market more and more of the same, produced in a futile search for profit. Marx's works provide several complementary explanations for sales crises: distribution conditions impede sales of production, falling profit rates lead to the waning of accumulation and thus an overproduction of capital goods, and during a boom there is a tendency toward an overproduction of consumer goods.

3 The use-values of which Marx speaks are material goods, not services. In modern capitalist nations; however, between 50 and 80 per cent of employees work in the service sector, to which state and semi-public organizations may also belong, but this service sector is still, for the most part, structured along capitalist lines. As we are about to see more clearly with the benefit of the second volume of *Capital*, the production of services represents for Marx only a deduction from the capitalist production of wealth. Hence either the industrial capitalism which Marx analyses

is in decline and his theories can no longer contribute very much to the understanding of modernity, or his analysis requires a fundamental modification if it is to contribute to illumination of the current situation.

We seek to show in the following that the static understanding of use-value advocated by Marx is misguided and should be replaced by another, gaining in this way an approach which we do not offer as a brilliant, new, all-inclusive theory, but rather as inspiration to a critical reading of Marx.

Use-value and circulation

In ‘Commodities and money,’ the first chapter of the *Capital*, volume I, Marx states, having called capitalist wealth an ‘immense accumulation of commodities’:

A commodity is, in the first place, an object outside us, a thing that by its properties satisfies human wants of some sort or another. The nature of such wants, whether, for instance, they spring from the stomach or from fancy, makes no difference.⁸⁷

Spiritual needs appear to be more important for Marx, because he adds a footnote with a citation from Barbon: ‘Desire implies want; it is the appetite of the mind and as natural as hunger to the body . . . the greatest number (of things) have their value from supplying new wants of the mind’ (Barbon 1696, pp. 2–3). Marx continues with Barbon, who believes things have their own inherent virtue, which is everywhere (‘in all places’) the same. This virtue of things is their ‘use-value.’ Barbon takes as his example a magnet, which attracts iron, a characteristic which, as Marx adds, is ‘useful’ as soon as magnetic polarity is discovered, i.e. for the production of compass needles. Use-value must then be classified according to quality and quantity; ‘To discover the various uses of things is a historical deed’ (Marx 1990 [1887], p. 30). That is how the use-value of magnetic ore was discovered.

Use-values are realized only in ‘use or consumption’; ‘they constitute the substance of all wealth, whatever may be the social form’ – and only in commodity-producing societies do use-values have ‘exchange value,’ which is then what the rest of Marx’s work focuses on. This completes his treatment of use-value, except that he later deploys his brilliant but dazzling dialectical abilities in his discussion of the capacity of the use value of the commodity labour power to produce surplus value, and that of capital to create profit (hence interest). In the 1859 *Contribution to the Critique of Political Economy*, he says quite pointedly, ‘Use-value as such, since it is independent of the determinate economic form, lies outside the sphere of investigation of political economy’ (Marx 1981 [1970], p. 28). (There is, of course, also what is known in Germany as ‘commercial knowledge of commodities’, *Warenkunde*, but he is not interested in this.) ‘It belongs in this sphere only when it is itself a determinate form.’ – We would add (a ‘we’ who have already read *Capital*): for example – no: *principaliter!* – in the determination of the form of the commodity ‘labour power’.

I believe that this too abstract concept of use-value is inadequate. First of all: 'From the taste of wheat it is not possible to tell who produced it, a Russian serf, a French peasant or an English capitalist' (ibid.). In the most important use-values—specifically, works of art (are not spiritual needs placed at the forefront, according to Barbon?) – notice is taken of the place of origin of the artist, and better food-stuffs reveal something of their land of origin. To the extent that one looks for objective characteristics, we can see that sciences such as food chemistry and criminal science are becoming more and more adept at tracking down the origins of beef or bullets. Archaeologists know where Neolithic flint blades come from, and DNA testing can identify the lost hair of individuals.

By contrast, Marx in his analysis of industrial capitalism understands use-values to be homogeneous, just as gold or grain is to some extent also homogeneous, when it is simply exchanged (gold) or eaten (bread). While there might be no strict homogeneity in the sense of the natural sciences, it is sufficient, according to societal norms. Marx's definition could therefore be defended as a socially specific abstraction: he recognizes the alienating character of a commodity-producing society which in its advance to a mechanized industrial capitalism eradicates the individuality of the products of labour. According to Marx's account of the exploitation process, the alienation of labour, which robs production of individuality, hence the craft basis of artistic creation, is reflected in the multiplication of similar products – homogeneous use-values – whereas previously every product had its own value. Accordingly, Marx goes behind these abstractions wherever required by his historical-conceptual perspective, and so especially where he formally contrasts the formal and real subsumption of labour to capital. Homogeneous use-values arise from the latter. So long as this subsumption is only formal, the manual worker still produces individual products, which, if we accept the Marxian tendency toward universalization of industrial production, are only gradually replaced by serial production, taking place historically in the course of proto-industrialization.

From this, it follows that the periodization of capitalist development requires, first of all, a cultural-historical differentiation of the concept use-value as soon as industrial capitalism is understood to be a historical phase and not as the last significant intermediate goal of development before a transition into another mode of production – there is a capitalistic before and after, if we want to observe history through Marx's spectacles.⁸⁸ With regard to the transition from the earlier form of capitalism to the industrial form, material can be found in the writings of the Historical School on the history of arts and crafts, as well as in early accounts of trade by merchants, dealing specifically with the nature of commodities and which can be traced back even to the ancient world. Aristotle, as we have seen, demands that production be for use, and another Socratic thinker, Xenophon, describes in *Memorabilia* how Greek manual labourers, on one hand, followed a local typology when working to order but, on the other, dealt with individual needs, their work ethic remaining centred on the quality, rather than the quantity, of the product.⁸⁹

The description of the quality of use-values demands that they be placed in cultural-historical context; it cannot be reduced to a natural science specification.

Only the elementary particles of a given type – e.g. electrons – are in principle indistinguishable. It must also be said that economical use-values as (put in physical terms) macroscopic objects can take their place in a wide range between homogenization and individuation. For us, it seems that economic advance has led to homogenization. However, brand development and fashion have also led to differentiation. Compared to a work of art, one might not think much of these, but they do have economic importance. Modern microeconomics describes these new differentiations with the analytical apparatus of the theory of imperfect competition.

Marx is correct to note that the constitutive characteristics of use-value must always first be discovered, like the magnetization of iron, which led to the compass needle and the invention of the compass, and these finally led to new navigational techniques and the circumnavigation of the globe. Since the future is open, there is, strictly speaking, no given use-value; rather, the usefulness of things develops without foreseeable end. The knife which was invented to kill and carve up prey evolved into a surgeon's scalpel. Marx, of course, knew this; however, his theory of capitalist development essentially turns on process innovation, rather than product innovation. In fact, the first and second Industrial Revolutions can be described as the outcomes of process innovations. Seen in this light, the historical material dealt with by Marx represents in the first place an illustration of the connection between technology, institutions, and the logic of the economic process in the course of economic history, from the last third of the eighteenth century until the second third of the nineteenth century. There were product innovations even then, but it did not suit Marx's ideological goals to point this out in particular and to show to what extent capitalism led to changed ways of satisfying need.

How could this volatility in the satisfaction of need be addressed in terms of the Classical tradition of political economy? Does not this question lead beyond the Classical tradition to the Neoclassical school and to the Austrian variant in particular? Did not the German reception of Adam Smith from the start reinterpret the concept of use-value individually and subjectively, in order to be able to say, for example, that the exchange value of commodities sold could not be higher than their use-value? From there to Gossen's marginal utility was only one (admittedly large and inspired) analytical step.

A third approach to theory formation has not, despite several attempts, really been tested (Scheffold 1985). It would, on one hand, have to expand the concept of use-value: goods have a vector of characteristics (Lancaster 1966) which are suitable for the pattern of consumption of particular socioeconomic groups, as can be determined in any case *ex-post* by observing styles of consumption, from the point of view of a social scientist, based on generation, level, and career.⁹⁰ In so doing, it turns out that different components of character vectors of merchandise are decisive for different consumers. Goods are to some extent interpreted, and interpretations change with fashion and developments which consumer groups follow: use-value is therefore something that has to be discovered by groups of consumers. Use-value is not something fixed; rather, it is, as Marx observed but

without working out the consequences, the discovery of the diverse uses of a 'historical deed' – not only in the pantheon of science and technology, but also in the daily life of the most insignificant of consumers. A perfect example of the entire use-value of a good is precisely the irreducible abstraction which Kant terms 'the thing in itself.' If we agree with Marx and Barbon that spiritual needs and the imagination expand the possibilities of use-value, we have to see who in the economy has reshaped use-values, even if merely popularising a new recipe for spinach, who follows this, and on what basis.

And thus it becomes clear how, if we acknowledge a dynamization of the use-value term, we would have to read Marx's chapters on the circulation of goods with different eyes than we had in the past. Use-values alter in circulation: whoever sells goods to a producer will want to make it clear that with these goods, more profits can be made than with others, and producers or sales representatives will, for their part, want to make the use-value of the goods produced more satisfying for the consumer. From this perspective, circulation contains an element of production. It alters use-value, but without forcing us to assume *given* preferences, as in the Neoclassical era. For the change in use-values has to be, in Neoclassical terms, accompanied precisely by a *change* in preferences. Changing preferences, however, are not necessarily consistent. If the preferences of a consumer change because the commodity is offered in a friendly manner, this is hardly an opportunity to revise the entire structure of preferences of all commodities; he responds more to momentary attraction.

The objection will be made that Classical analysis was concerned with the long run or, as Marx preferred to say, with averages. On average, use-value and consumer habits are fixed. The adjustments in use-values mentioned previously would either affect secular development or concern short-term effects. In the former case, entirely new characteristics will be discovered in things – this would be similar to technical changes, such as the discovery of magnetization and the production of compass needles, and thus would be irrelevant for analysis of the long term in which production prices are formed. In the latter, it is a question of quite short-term effects, such as when a young man suddenly decides to give his new love some flowers. Such short-term effects have no relevance in a theory of values and production prices.

This one-sided perspective fails not only to take proper account of the task of selling, but defines it away. Our young man purchases flowers perhaps only once, but the flower shop must know how to attract customers on a daily basis for whatever reason, so that flowers are bought and sold at certain times of the year, according to particular rhythms, and the skill of the salesgirl consists in seeing that she must constantly evoke changing use-values with ever new customers, so that the business lasts for decades.

We have thus obtained a method, if only just sketchily, for theoretically extending the Marxian analysis of circulation. Modern production price analysis offers an entirely different approach, in which we now introduce the analysis of fixed capital. Only after these preliminaries will we turn to the text itself, in order to connect the two new elements into a critical reading of Marx.

Sraffa: A Modern scheme for the unity of production and circulation

The familiar Modern formula for production price

$$(1+r)\mathbf{A}\mathbf{p} + w\mathbf{l} = p, \quad (1)$$

in which \mathbf{A} represents the input-output matrix, \mathbf{l} the work vector, (\mathbf{A}, \mathbf{l}) the technique for production of n goods in n sectors (output assumed to be units), the profit rate, w the wage rate, and \mathbf{p} the vector of production price or normal price enables, with a given distribution, the immediate calculation⁹¹ of prices using the formula

$$\mathbf{p} = w(\mathbf{I} - (1+r)\mathbf{A})^{-1}\mathbf{l}. \quad (2)$$

The system of determining the n prices represented in vector \mathbf{p} , the wage rate w , and the profit rate r has n equations but the $n + 2$ unknowns \mathbf{p} , w , and r . Of the two degrees of freedom, one is fixed by the choice of a *numéraire*. If the left side eigenvector \mathbf{q} of \mathbf{A} is chosen as *numéraire*, following Sraffa, with $(1+R)\mathbf{q}\mathbf{A} = \mathbf{q}$ and if the *numéraire* is more precisely written as $\mathbf{q}(\mathbf{I} - \mathbf{A})$, with the requirement that $\mathbf{q}(\mathbf{I} - \mathbf{A})\mathbf{p} = 1$ is valid for all distribution levels, then one equation is fixed. This shows that the wage rate is linearly related to the profit rate. Thus, Sraffa's so-called standard system is obtained. Let

$$w = \left(1 - \frac{r}{R}\right), \quad (3)$$

in which R is the maximal profit rate which can be achieved in the system with positive prices. If we now alter distribution, beginning at $r = 0$, for example, we observe how wages and prices shift.

These arbitrary changes of distribution are naturally no reflection of real processes, but rather a mathematical abstraction developed to see how the variables are functionally connected one with another. Here, it is apparent, first of all, that the wage rate moves inversely to the profit rate, which is no surprise to anyone familiar with Classical and Marxian economics. The particular technology signifies, in Marxian terms, a particular level of the productive forces and a particular surplus product. If the profit rate is $r = 0$, then this surplus product goes entirely to the workers. If r is assigned successively higher values, then the wage rate must fall, because with a given technology the surplus product must be distributed as wages and profits. If the standard commodity $\mathbf{q}(\mathbf{I} - \mathbf{A})$ is selected as the *numéraire* (with the additional standardization $\mathbf{q}\mathbf{l} = 1$), the linear relationship, already mentioned, results. If this result is inserted in the price formula, an unambiguous expression for the calculation of price is obtained –

$$\mathbf{p} = \left(1 - \frac{r}{R}\right)(\mathbf{I} - (1+r)\mathbf{A})^{-1}\mathbf{l}; \quad (4)$$

it is only necessary to insert new values for the profit rate, one after another, in order to calculate the corresponding production prices, expressed in the standard commodity. For $r = 0$, the prices are the same as the labour values:

$$\mathbf{p}(0) = (\mathbf{I} - \mathbf{A})^{-1} \mathbf{l}, \quad (5)$$

for if this is transformed into

$$\mathbf{p}(0) = \mathbf{l} + \mathbf{A}\mathbf{p}(0), \quad (6)$$

it can be seen that $\mathbf{p}(0)$ are indeed values, because the labour value of each commodity is equal in each industry to the direct labour (which is included in corresponding component of \mathbf{l}), plus the indirect labour $\mathbf{A}\mathbf{p}(0)$ contained in the commodity input.

We can thus see that the production prices defined by (1), when the wage curve – through measurement by means of the standard commodity according to (3) – is inserted in (2), can be calculated according to (4), without necessitating a recourse to labour values; these result, rather, according to definition (6), after (5) from the same formula (4), which allows the prices to be calculated. Therefore, the labour values here, in contrast to their appearance in Marx, are no logical *prius* for production prices, and it can also be demonstrated that the use Marx makes of labour values to calculate in his own way production prices is mathematically incorrect; profits, in particular, cannot – apart from certain exceptions – be interpreted as redistributed surplus value.

Just as modern production price theory serves to explain the relationships between values and prices, and hence the so-called transformation problem, it can also help to explain the problem of circulation that Marx observed, in particular the intertwined elements (*Verschlingungen*) in the reproduction of fixed capital.⁹² In (1), only circulating capital appears. Coefficients a_{ij} of matrix \mathbf{A} indicate how much of commodity j is required for the production of one unit of commodity i in industry i and, indeed, in a given turnover period of capital, which in (1) is assumed to be the same for all industries (otherwise, the stipulation of the profit rate in the form used here would not be appropriate). The amount of time that passes, from the moment a product is created until it arrives at the market, varies (Ricardo spoke of ‘the time it takes to bring a commodity to market’).

Before we turn to various turnover periods, another differentiation has to be introduced. Among the preconditions yet to be addressed in the theory, dealt with only briefly here, is that there is at least one so-called basic good in the system presented in (1), which enters directly or indirectly into the production of every other good. Iron, for example, is indirectly required for the production of corn, because corn production requires a plough and a scythe. Luxury goods, in contrast, do not enter into the production of basic goods: neither technically nor via a (not yet introduced) subsistence wage. When matrix \mathbf{A} , for example, assumes the form

$$\mathbf{A} = \begin{bmatrix} 1/2 & 0 \\ 1/10 & 0 \end{bmatrix}, \quad (7)$$

we have before us a two-sector model, with a basic sector in the first industry. A unit of corn is produced, for example, with a half unit of corn and an undisclosed amount of labour. In a second industry, a luxury good is produced with $\frac{1}{10}$ corn, for example, whiskey.

In the next step, we examine intermediate products and thus find a way of representing different production periods. We see in (8) how, given the input matrix \mathbf{A} and labour vector \mathbf{l}_1 (which is a unit matrix here), the products presented are produced by output matrix \mathbf{I} . The double arrow \Rightarrow indicates production:

$$\mathbf{A} = \begin{bmatrix} \frac{1}{2} & 0 & 0 \\ \frac{1}{10} & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}, \mathbf{l}_1 = \begin{bmatrix} \frac{2}{3} \\ \frac{1}{3} \\ 0 \end{bmatrix} \Rightarrow \mathbf{I} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}. \quad (8)$$

The following interpretation is possible here: in the first sector, corn again is produced with a half unit of corn and $\frac{2}{3}$ labour. In the second sector, a unit of corn mash is produced with $\frac{1}{10}$ corn and $\frac{1}{3}$ labour. This corn mash, however, is not sold but set aside in its entirety for a third process, ageing (no labour is required), in order to produce whiskey.

The price associated with this process can be calculated according to (4). The standard commodity, however, consists only of the basic commodities of the system, here the corn, as Sraffa and those who have come after him have explained (Sraffa 1960, ch. IV and appendix D). In this way all three commodities obtain their price of production, the corn, the corn mash, and the whiskey, although the corn mash never even makes it to the market; rather, it is set aside to age for a period of time (e.g. a year). The turnover of the capital of whiskey producers is, therefore, not carried out in one but two periods. This difference is expressed in the corresponding price relations. The maximum profit rate here is 100 per cent, because we obtain for corn price p_c :

$$p_c = \frac{2}{3}w + (1+r)\frac{1}{2}p_c$$

and from that

$$p_c = \frac{\left(\frac{2}{3}\right)w}{1 - (1+r)\frac{1}{2}}. \quad (9)$$

The maximum profit rate is $R=1$ when the wage rate is $w=0$ because then $p_c = (1+R)\frac{1}{2}p_c$. We can insert this R in (3). For the price of the corn mash p_m and whiskey p_w from (8), we get:

$$p_m = \frac{1}{3}w + (1+r)\frac{1}{10}p_c,$$

$$p_w = (1+r)p_m,$$

so that by inserting the whiskey price, we unequivocally obtain:

$$p_w = (1-r) \left[(1+r)\frac{1}{3} + (1+r)^2 \frac{1}{10} \frac{\frac{2}{3}}{1-(1+r)\left(\frac{1}{2}\right)} \right] \quad (10)$$

The formulas are suitable for indicating the influence of the interest on capital on pricing. If the profit rate is zero, for example, the whiskey and corn mash prices correspond because of $p_w = (1+r)p_m$. Within the framework given by the doctrine of labour value, the ageing process does not add anything to the value of the whiskey – not even if the ageing process is extended over additional production periods. If the profit rate is set at 0 in equation (10), the result is $p_w = \frac{1}{3} + \frac{2}{15}$; the value of the whiskey consists of the labour input to the corn mash, in addition to the labour embodied in the corn used, which amounts to $\frac{2}{15}$, because $\frac{4}{3}$ is the labour value of a unit of corn, of which $\frac{1}{10}$ goes into the corn mash. If, however, the profit rate or the interest on capital is taken into consideration, the labour input, which occurred at different times far in the past and both of which go indirectly into the whiskey, have to be added and multiplied with various functions of r , so that the relative price of corn (9) and whiskey (10) move through a complex development.

If we look only at production periods, extensions of the period have no effect upon labour values, so that a producer who leaves his product aside for a period longer than another without any qualitative change suffers no disadvantage expressed in the value of the product. For Marx, who otherwise read the competitiveness of a producer out of the labour value of the product, this is a disturbing result, which we will have to discuss. From the standpoint of modern production price theory, by contrast, it is more a matter of relative price, and a producer with access to a technology allowing him to underbid his rivals is competitive. Extensions of production periods are reflected in higher interest costs. The Austrian capital theorists therefore thought that capital should be measured two-dimensionally, according to the expenditure of labour, on one hand, and its

distribution over time, on the other – from which Böhm-Bawerk constructed the average production period. As a more intensive consideration of Sraffa shows, however, the functions of price dependence on the rate of profit, represented in formulations such as (10), are so complicated that of the two technologies, one with a lower profit rate, the other with a higher rate, the first can be the more profitable at a still higher price – Sraffa illustrates this with the famous example of the ‘wine’ and ‘an oak chest.’ Böhm-Bawerk thought that technologies with longer production periods would be chosen at lower interest rates; however, that does not generally appear to hold true.

Although the time which is necessary to bring a product to market, in Ricardo’s terms, already leads to complex results in a production structure such as (8), we have not yet given expression to the essential characteristic which differentiates fixed capital from circulating capital. First John von Neumann and then Sraffa dealt with fixed capital as a joint product, according to the following pattern, here simplified to the greatest degree possible. Corn is produced only with the aid of corn, labour, and a tractor, which can become old and thus wears out over time, until after T years, it can no longer be used. A tractor is produced with the help of corn and labour. We therefore obtain the following $T + 1$ equations:

$$(1+r)k_0 + wl_0 = p_0, \quad (11.0)$$

$$(1+r)(k_1p + p_0) + wl_1 = p + p_1 \quad (11.1)$$

$$(1+r)(k_2p + p_1) + wl_2 = p + p_2 \quad (11.2)$$

...

$$(1+r)(k_Tp + p_{T-1}) + wl_T = p. \quad (11.T)$$

Here, k_t, l_t ($t=1, \dots, T$) indicate the amounts of corn and labour which are used over the course of T years, together with a tractor priced at p_{t-1} , in order to produce a unit of corn at price p and a one-year-older tractor at price p_t . Only at the end of year T is the tractor no longer useable; therefore, price p_T transpires. With the aid of k_0 and l_0 , a new tractor will be produced in the first process carried out.

In order to calculate prices in this system, it is, according to Sraffa (1960, ch. X), necessary to multiply the equations (11.T), (11.T-1), ..., (11.1) successively with factors $1, (1+r), \dots, (1+r)^{T-1}$ and to add them all together. The price of the tractor at every age $1, \dots, T-1$ is expressed by the sum, as can easily be seen; a combined equation remains in which the coefficients of the corn and labour input, k_t and l_t where $t=1, \dots, T$ and corn emerges at price p with complicated polynomials:

$$(1+r)^T p_0 + \sum_{t=1}^T (1+r)^{T-t} [(1+r)k_t p + wl_t] = \sum_{t=1}^T (1+r)^{T-t} p. \quad (12)$$

This so-called integrated equation (12), in connection with (11.0), represents a reduced system, from which old machines were eliminated. The new machine, at price p_0 , remains. Once again, we have two equations with four unknowns: two prices, the wage rate and the profit rate, which we could deal with as previously. A numerator has to be fixed (here, too, there is a standard commodity and a maximum profit rate), so that the wage curve can be expressed as in (3); then, both prices p_0 and p can be calculated as functions of the profit rate, according to the pattern in equation (4), although the appearance of the polynomial in (12) clearly leads to complicated price effects following changes in distribution. In extensions of the model, systems with fixed capital can be defined in which machines appear not only in one production sector (corn here) as in (11) but in many, because machines can be traded between sectors; for example, tractors can be used in the production of corn and turnips.

The important questions raised by Marx can already be discussed, however, in Type (11) systems.

Over the course of a machine's working life, its reliability can decline, just as motor vehicles increasingly require repairs, a tendency we could express, when it clearly applies to all T periods, through the given $k_1 \leq k_2 \leq \dots \leq k_T; l_1 \leq l_2 \leq \dots \leq l_T$. It is also conceivable that the longer a machine remains in use, the better it runs; then the signs turn the other way round: $k_1 \geq k_2 \geq \dots \geq k_T; l_1 \geq l_2 \geq \dots \geq l_T$.

In reality, an overlapping of the two tendencies is to be expected. It might be that a machine is under construction, so that at first its production is quite low or even disappears, and then we expect a pattern of increasing and then decreasing efficiency, in particular with labouring animals or, in historically relevant cases, slavery. Positive prices do not result automatically. In system (1), all merchandise obtains positive prices when all goods are basic goods and a surplus product results. A positive surplus product is, however, not sufficient in system (11) for positive prices with old machines, because if their efficiency declines due to increasing repairs, at some point it might be more expedient to replace the old machines with new ones, thus terminating use of the machines after a certain period of time (the technical term for this is truncation). A machine which has become inefficient, due to the necessity of making repairs, adds no more value to the product but instead represents a reduction of value. In order to see this more precisely, we write the amortization of the machine, through a transformation of equation (11.t), in the form of the following equation:

$$rp_{t-1} + (p_{t-1} - p_t) = p - (1+r)k_t p - wl_t. \quad (13)$$

On the right, here, is the difference between the proceeds (from the corn produced) and the direct costs of its production, of the corn advanced and the wages for labour. On the left is the amortization, which brings together the financial charge rp_{t-1} , resulting from the advance for a machine at the age of $t-1$, and the change of value of the machine, thus the depreciation of $p_{t-1} - p_t$. This depreciation can become so large that continued use of the machine becomes a financial burden, and this can even happen if the prices are equal to the values at $r=0$;

negative values then emerge which show that use of the machine should be terminated because it wastes labour. More generally, with positive profit rates and the declining efficiency of a machine, the loss of value continues until the price of the ageing machine has fallen below zero. It then should no longer be used but be replaced by an increased use of newer machines.

This termination does not signify the ‘moral’ attrition of which Marx speaks. This obsolescence appears instead when a new machine of a different kind is placed alongside the machine already examined. A more visual example would be: horses are replaced by tractors. The use of tractors then determines prices, the breeding of horses for agriculture is discontinued; however, the use of horses still on hand can, for a limited time, yield a return on the direct costs of production.

In many cases, however, a more simple assumption suffices: that the machine exhibits constant efficiency with $k_1 = k_2 = \dots = k_T = k$; $l_1 = l_2 = \dots = l_T = l$. Then equation (12) can be rewritten as

$$(1+r) \frac{r(1+r)^{T-1}}{(1+r)^T - 1} p_0 + (1+r)kp + wl = p, \quad (14)$$

in which the coefficient, which is multiplied by p_0 , can be broken down into two summands:

$$\frac{r(1+r)^T}{(1+r)^T - 1} = r + \frac{r}{(1+r)^T - 1}. \quad (15)$$

Together with (11.1), equation (14) again determines corn price p , with a particular *numéraire* and a particular profit rate, and the price of the new machine p_0 . Clearly, coefficient (15), which expresses the cost of using the machine, tends the more to r the longer the service life of the machine ($T \rightarrow \infty$); for ‘perennial’ machines which experience no depreciation, this burden consists only of capital costs. It can be shown that depreciation is progressive for machines with a finite lifetime and constant efficiency; we express this through the relationship of a t period old machine to a new machine according to the formula

$$\frac{p_t}{p_0} = \frac{(1+r)^T - (1+r)^t}{(1+r)^T - 1}, \quad (16)$$

which, when $r = 0$, is converted into

$$\frac{p_t}{p_0} = 1 - \frac{t}{T}. \quad (17)$$

According to (17), depreciation is therefore linear, if $r = 0$ and the prices correspond to the values. If, however, the profit rate is positive, according to (16)

a progressive depreciation is obtained and, indeed, for a reason that is quite easy to understand: with machines which are still relatively new, the financial burden is still relatively high because the machines are still worth a great deal, so that the depreciation amounts to relatively little, since, according to (13), the sum of the financial burden and depreciation, hence amortization, is by definition independent of age with machines of constant efficiency. The right side of (13) is, to be precise, constant with constant efficiency. The falling price of a machine results in a declining financial burden p_{t-1} . Thus, the depreciation $p_{t-1} - p_t$ in (13) must increase. In actual business practice, by contrast with this progressive depreciation, linear and degressive depreciations predominate; they can be justified as approximations in a world in which 'moral wear and tear' (obsolescence) plays an important role.

On the whole, we can see – and the result could still be explored in much greater depth – that the assessment of machines and thus the use of various machines, according to the choice of technology, are strongly dependent upon the profit rate. A production method can be advantageous at one profit rate, then at a higher profit rate be less advantageous than another, and at a still higher profit rate dominate once again. This holds true in the comparison of different machines as well. Finally, the truncation of a machine, the determination of its optimal lifetime, can depend upon the profit rate in this complicated way so that using a machine which does not run at constant efficiency is therefore advisable – for example, at a lower profit rate – during the course of its technically maximum lifetime of T years, while at a higher profit rate its functional lifetime should be shortened. Then it could be that at a still higher profit rate, T again represents the optimal length of life.

As can be confirmed in individual cases and as we want to show at least with selected examples, the formalism introduced here offers a way of representing the circulation figures observed by Marx. In so doing, however, it turns out that the level of distribution and thus the difference between values and prices have a significant influence on the results. There have been occasional attempts at getting over the difficulties which Marx confronted in attempting to solve the transformation problem by considering the values to be sufficiently good approximations to production prices. Marx himself resorted to that. In the examination of fixed capital, however, we recognize that in the measurement of prices, qualitatively different results are obtained than in the measurement of values. Whoever wants to test the logical validity of statements of Marxian theory must therefore examine to what extent they can be reformulated using the modern theory of prices of production.

The metamorphoses of capital

In Engels' editorial manuscript (and later in Volume II of *Capital*), the costs of circulation appear in the sixth chapter of the first of the three sections which make up the book. These costs are subdivided into 'circulation costs – which arise from the change of form as such', 'costs of storage', and 'costs of transportation'. In the

published book, the awkward but more exact title ‘Circulation Costs – which arise from the change of form as such’ is replaced by the simpler title ‘Pure Circulation’ and this appears in the Moscow edition.

For the capitalists who have others working for them, buying and selling become primary functions (Marx and Engels 2005 [1884/85], p. 103). During the Middle Ages, producers dealt directly with one another, during time which was for both ‘consumed unproductively’ (ibid., p. 102) and indeed often on holidays, associated with churchgoing and political assemblies. Capitalism, however, involves regular activities – even when, we could add, the purchaser acquires a product which will perhaps only be bought once in a lifetime, like a christening cup, a wedding dress, or a coffin. Marx thought it was perfectly clear:

If by a division of labour a function, unproductive in itself although a necessary element of reproduction, is transformed from an incidental occupation of many into the exclusive occupation of a few, into their special business, the nature of this function itself is not changed.

(Marx 1971a, p. 134 [p. 103])

If a merchant assumes the sales functions for several producers and many consumers, the goal (*Zweckbestimmung*) of selling remains in fact the same.

However, the new division of labour, in which some engage in business as buyers or sellers for others, is adopted in the market only because it has cost advantages. The ‘metamorphosis of capital’ must be connected to some degree with regular expenditures which allow for a reduction in the price of operations, to the extent that the same producers and buyers are still brought together. Or, alternatively, new classes of buyers will be developed, costs will be distributed across a larger number of transactions, and we might say that the so-called use-value of merchant capital becomes that it extends markets.

Certainly, value theory can be *defined* in such a way that buying and selling times are not counted as creative of value, nor are the other activities associated with it, except for transport. However, the question arises of whether that is a reasonable definition, where the reasonableness of the definition must first be measured by whether, starting from this point, real prices can be explained better than by another approach. The analysis must first of all be correct; then one can perhaps draw conclusions of potential political significance.

The alternative would be to explain prices by directly referring to the production structure, as happens in the theory based on Sraffa, where buying and selling times are described as additional expenditures of labour and materials arising from this. These costs can be considered included, to the extent that they could not be made to disappear in the long term, even with competition – according to the same criterion, then, which is used in a narrower sense for estimating expenditures on labour and materials for production. Thus, direct prices are obtained, which, in accordance with the prevailing rate of profit, also include buying and selling costs.

The model in formula (8), mentioned earlier, can be used as an illustration. We can reinterpret it so that in the first sector, corn is produced with the aid of corn;

in the second sector, spirits are produced with the aid of corn; and the third does not represent the ageing which follows but the sale of the liquor, which also takes place over a period of time. What previously appeared in formula (10) as the price of the whiskey is now the price at which the liquor is sold to the public, p_w , and the price p_m of the liquor now represents the price at which the liquor producer, as an intermediary, sells to the merchant. Even if, as in (8), nothing is inserted for the labour of selling, the two prices, which are linked through $p_w = (1+r)p_m$, are different as soon as a positive profit rate emerges. The complex formula for the final price (10) reveals that an increase in the profit rate raises the final price to the extent that it creates interest on dated labour of the past, or it diminishes insofar as an increasing profit rate, signifying a declining wage rate, implies lower wage costs.

When, in this sense, sales activities are taken into consideration, even in only the purest form of simple buying and selling times, prices prove to be dependent, in a complicated way, upon distribution not only because of production but also because the choice of technology is codetermined by the influence of distribution on the evaluation of the sales times. A longer sales time, included in the price, raises it; however, if this longer sales time makes it possible to fall back on a cheaper production process, it might be worthwhile accepting it, using the corresponding technology. Thus, it might be more difficult, and therefore on average take longer, to sell automobiles, which use a new source of energy (let's say, natural gas), which is cheaper to use because natural gas costs less – where you can find any.

From this, it follows that production and circulation are not only interconnected but that they also influence each other. The complete circuit of capital includes production time. It cannot be completely separated from production because once in circulation, use-value also changes for the user, and marketing performs a productive function in ensuring that this change takes place. Certainly, waste may occur in circulation, just as it can occur in production; however, it appears to be a dogmatic overstatement when the merchant himself is said to belong 'to the *faux frais* of production' (Marx and Engels 2005 [1884/85], p. 103). Marx calls it 'a miracle if such transformation could be accomplished by the mere transfer of a function' (Marx 1971a, p. 135), but producers who sell their own products already find it necessary to emphasize the particular aspect of the use-value of their goods which will inspire a particular type of consumer to purchase it. The more traditional a society is – or, in modern terms, the weaker the growth is and the closer an economy is to a condition of static reproduction – the less innovation is connected with sales in the society as a whole, while in a society marked by robust growth, the continual invention of new goods also leads to the continual discovery of new characteristics of these goods. Computer companies, software developers, and software users are daily taken up with new products and what can be made of them. By contrast, the job of a horse-dealer seems to exhaust itself in cheating the customer, who is fooled into thinking that the animal being praised is capable of more than later proves to be the case. And yet already the horse merchant will certainly be able to sell a more expensive horse to a young

man who only wants to go riding, when he argues effectively how good the young man will look parading through the streets on the horse.

In his attempt to deny the productivity of merchant capital, Marx is confronted with the difficulty that surplus production is associated with it; he views this, on the whole, as a deduction from production. If there were full employment, it could in fact be said that more workers in the sphere of circulation mean less productive labour in industry. However, since Marx otherwise insists that in capitalism there is always a reserve army, this argument, coming from him in particular, is unconvincing. In any case, the sales costs of consumer goods, for a given distribution, are passed on to consumers.

Conversely, it might be objected that the differentiation of use-value upon which our argument is based is inseparably connected with imperfect competition. In all of our examples, it was the heterogeneity of the goods, the mutability of use-value, and the creativity on both sides of the market which moved us also to attribute a positive aspect to circulation. It does appear to me that one advantage of Classical Theory has always been that it presupposes no complete homogeneity of commodities, and, contrary to the price theory related to perfect competition, the merchant is not faced with a perfect elasticity of demand. This is because Classical Theory attempts to characterize competition not through the static equilibrium of the Neoclassical microeconomic textbook, but through a dynamic equalisation of rates of profit, and thus the image of the competitive buyer and seller, sketched here, is acceptable.

After our thorough critique of the age-old claim that all sales are unproductive, a claim which Marx simply reproduces, we will now turn to individual aspects of circulation theory. Marx said of accounting that it, too, changed nothing, 'nor is it altered by its divorcement from those productive functions of which it formed an appendage' (Marx 1971a, p. 137 [p. 106]), when delegated to special agents. Here the question arises of whether one might ever concede that accounting should be separate from production, since production is controlled through accounting. If the speed governor is part of a machine and thus also of production, then the lists of materials and product line profitabilities derived from accounting also represent instruments for the management of production. Thanks to accounting, the engineer knows which replacement parts are in stock and in what quantity, and only with this knowledge can regular production be guaranteed. Marx then points out that accounting is 'more necessary in capitalist production than in the scattered production of handicraft and peasant economies, more necessary in collective production than in capitalist production' (Marx 1971a, p. 138). We have already examined how use-value changed during the transition to capitalism. The history of the twentieth century has taught us how much the products of capitalist and collective production differ. Following the reunification of Germany, East German consumer goods production was overnight replaced with an expansion of West German production, although the East German system had previously at least ensured subsistence. However, the population clamoured, as it were, for the use-values modified by capitalism.

There follows then a section which apparently refers to the differentiation, suggested by Hildebrand, between barter economy, money economy, and credit-based economy.⁹³ The direction taken by Hildebrand's essay would not have been welcome for Marx, since Hildebrand saw in the credit economy an opportunity to help the virtuous poor to become independent through the advance of bank loans and so show them the hidden pathway out of a proletarian existence.⁹⁴ This same Hildebrand also disputed the theory of immiseration advanced by Engels and Marx. He argued that even at the beginning of industrialization, though peasants streaming into the city may at first have still had a very low living standard, this nonetheless represented a higher standard of living than that of the rural poverty from which they had fled. Marx does not here criticize Hildebrand's emancipatory version of capitalist history; instead, he attacks the logic of a model of stages which would actually have to begin with an exchange economy, so that the same criteria for distinguishing the first stage might be used to differentiate the second and third stages. Beyond this formal objection, it should be recognised that in a barter economy, personal credit must of necessity play a very important role because only in exceptional cases do exchanges result in the direct mutual satisfaction of needs.

Insofar as credit costs are circulation costs borne by production, these can be identified at very early developmental stages. That would find confirmation in the tendency, suggested by Marx, for circulation costs to fall as a result of progress (for example, through the rationalization of accounting), although the differentiation of use-values creates new marketing costs.

Given our analysis thus far, we do not have to examine in any great detail the storage and transport costs which Marx discussed. He admits that storage does at times serve production, and he always treats transport as productive. It also cannot be denied that in agriculture, seed storage at moderate levels represents a productive precondition for the next harvest. Stockbuilding which ensures regular production and distribution can be differentiated from stockbuilding intended to provide protection against natural risks, such as harvest fluctuations. Intentional stockbuilding of this kind is in turn distinct from unintentional stockbuilding, which happens because of a collapse in sales unrelated to regular natural events and as a result of an economic crisis. The associated costs are rightly designated as unproductive.

Marx formulated a general law according to which '*all costs of circulation, which arise only from changes in form of commodities, add nothing to their value*' (Marx 1971a, p. 152 [p. 119]), and he illustrates this with the comment that 'a house sold by A to B does not wander from one place to another, although it circulates as a commodity' (*ibid.*). Let me adapt this image to contemporary conditions: the house travels everywhere, specifically in brochures to estate agents and potential customers, until that stratum of customer is found for whom the house can be made into something special; for example, doctors who discover that a clinic can be established in the basement and who will then compete to acquire the building. Through his denunciation of circulation as a false source of costs, Marx paved the way for the shortages which occurred in later communist-planned economies.

Planners sought to assign homes, and the population was supposed to settle into prefabricated use-values, rather than create them.

The turnover of capital

As we have already indicated, the 'Introduction' to MEGA-2 II/12 places particular emphasis on Engels' attempts to explain the limitation of production and circulation and of fixed and circulating capital. Indeed, capital does appear, when formulated with the help of joint production, as both fixed and circulating, for when we look at equation (11), the machine is fixed in a succession of production processes for T periods, and yet the machine aged $t - 1$ at price p_{t-1} is entered into the shipment period t , in equation (11, t), and leaves the process again as another machine at a new price p_t . The greater the T , the more certain it is that capital has to be considered fixed. In the transition to an 'eternal' machine, only debt servicing remains, and the right side of (15) tends to r .

In the editorial manuscript, there is a remarkable formulation where durable '*instruments of labour*' are referred to: 'This part of constant capital yields up value to the product, in proportion as it loses its own exchange value together with its own use value' (ibid., p. 160 [p. 126]).⁹⁵

In this statement, Marx – surprisingly – quantifies use-value; there is more or less of it, as with the 'vulgar economists' who are concerned with subjective value. Use-value is the embodiment of various characteristics which, in the case of fixed capital, can increase or decrease individually. We have spoken of efficiency rising or falling or remaining stable with increasing age. Use-value can be measured in many discrete dimensions, but it cannot be expressed meaningfully in a single number without abandoning Marxian categories.

The entire second section of the book contains numerous statements connected to applications of the labour theory of value, which are very well illustrated by examples drawn from the phase of industrialization contemporary with Marx, but in which, especially because of the interesting use of the labour theory of value, the deviation of price from value leads to difficulties. Thus, Marx says, for example, 'If of two machines of equal value one wears out in five years and the other in ten, then the first yields twice as much value in the same time as the second' (ibid., p. 161 [p. 127]). Marx is probably referring here to machines of constant efficiency, because otherwise the comparison would be indefinite. When we look at our formula for depreciation (16), we see that Marx is wrong for $r > 0$, because when we designate the prices for the first machine, with $T = 5$, as p_0, \dots, p_4 , and for the second machine, with $T = 5$, with p_0^*, \dots, p_4^* , and then we choose, for instance, a space of time of two periods, where $p_0 = p_0^*$, and using equation (17), we obtain

$$\frac{p_0 - p_2}{p_0^* - p_2^*} = \frac{p_0(1 - p_2/p_0)}{p_0^*(1 - p_2^*/p_0^*)} = \frac{2/5}{2/10} = 2;$$

Marx's result is thus confirmed for $r = 0$, while for $r > 0$, a more complex relation results from (16). Due to progressive depreciation, the issue is whether the values transferred are compared at the beginning or the end of the machines' lifetimes.

To the extent that it does not concern the determination of value, but rather the description of the production structure, Marx's characterizations can be translated into fixed capital models of the type we have been considering, and vice versa. Marx argues that

It is only the functioning of a product as an instrument of labour in the process of production that makes it fixed capital. But when it itself only just emerges from a process, then it is by no means fixed capital.

(Ibid., p. 163 [p. 129])

A horse can function as fixed capital when it is used in farming for several production periods; it can, conversely, also be slaughtered and eaten. This differentiation underscores the fact that depending on the various uses to which it is put, the use-value of a good can be represented quite differently.

In what follows, Marx describes the depreciation of capital using modern railroad technology and arrives at the conclusion that the sequence in which elements of fixed capital are to be replaced might differ, if, for example, the sleepers have to be replaced every fifteen years, but the rails every twenty years. The periodization depends, moreover, upon the intensity of usage (Marx and Engels 2005 [1884/85], p. 140). The entire machinery will therefore be replaced as a whole after a period which we could call the complete turnover period, and which is equivalent to the smallest common multiple of individual replacement periods. For a railway line where the sleepers have to be replaced every fifteen years and the rails every twenty, the entire turnover period would be sixty years.⁹⁶ Marx thus considers what we earlier called the 'perennial machine'; he speaks of its 'secular duration.'⁹⁷

The volume of fixed capital is interconnected not only with the circulating element of constant capital, but also with that of variable capital. Under the conditions of the labour theory of value, only variable capital, with its periodicity, produces a surplus. Surplus production as a source of profit, therefore, flows forth in the rhythm of labour inputs. Marx now wrestles with the problem that before the introduction of a positive interest rate into the calculation of cost, a mere extension or reduction of periods has no effect on the values, which are, however, indicators of the socially necessary labour times required for the manufacture of one unit of a product, and which are thus supposed to play the decisive role in calculating the productivity of economic processes. The first volume of *Capital* already makes it clear that laziness and clumsiness do not increase the value of a product; competition works against the unnecessary extension of labour time. Marx is referring here specifically to the frequency of capital turnover. The faster that capital is used in the same process, the more frequently a surplus, which is connected with capital turnover, will be realized. A scarcity of available funds forces capitalists to keep turnover, circulation, and production periods short:

But by its ten-fold turnover and thus the ten-fold renewal of its advance, the capital of £500 performs the function of a ten times larger capital, of a capital

of £5,000, just as 500 shillings which circulate ten times per year perform the same function as 5,000 shillings which circulate only once.

(Marx 1971a, p. 312 [p.272])

The comparison of capital turnover with the circulation of money reappears frequently in the text, and necessarily so, because the metamorphoses of capital occur as it changes between its real and its monetary form. An entire school of modern economists has therefore set itself the task of connecting the circulation of money with the circulation of goods and capital. Because the school originated in France, these economists are called the ‘Circuitistes.’⁹⁸ Once he has assumed that capital is scarce, it is not difficult for Marx to show why periods cannot be unduly extended, just as the value of a labour product is not increased by laziness and clumsiness: only a lesser amount of added-value can be realized in a given time. His problem is to show why periods cannot be indefinitely reduced and capital turnover cannot be indefinitely accelerated. With regard to production, Marx turns to technical necessities: he draws on harvest cycles, the ageing of wine, and many other such examples. But cannot sales be sufficiently accelerated? And since the analogy with the circulation of money has been invoked: Why is one coin not sufficient to circulate the mass of commodities of an entire economy? Modern theory answers this with optimization models: which combinations of movable property – and, in particular, which cash holdings – are the best in a particular economic situation, with greater or lesser degrees of insecurity? For the circulation of commodities, this corresponds to the question of how much should be kept in a warehouse if customers buy only at irregular intervals. Although Marx, to some extent, recognizes the necessity of circulation, the framework of his categorical system makes it difficult for him to determine any limits.

In itself, Engels’ editorial manuscript is not suited to representing Marx’s doubts, his intellectual struggle, because the merit of Engels’ editorial work here consists in presenting what was achieved scientifically with textbook certainty. This is even more true in his work on the third volume. A reconsideration of Marx’s *Grundrisse*, the composition of which lay a generation in the past as Engels was editing volume II of *Capital*, at least hints at other potential directions for Marx’s thinking.⁹⁹

The introduction to the *Grundrisse* declares quite bluntly, ‘The object before us, to begin with, *material production*’ (Marx 1981 [1937], p. 83). This fixation on tangible objects, which will run all the way through to the late *Capital* manuscripts, is countered by a dynamic conception of use-values in considering the connection between production and consumption when Marx then says, in a formulation not found later in *Capital*:

The product only obtains its ‘last finish’ [FN] in consumption . . . For example, a garment becomes a real garment only in the act of being worn; a house where no one lives is in fact not a real house . . . for the product is production not as [FN] objectified activity, but rather only as object for the active subject . . . if it is clear that production offers consumption its external object, it

is therefore equally clear that consumption *ideally posits* the object of production as an internal image, as a need, as drive and as purpose.

(Ibid., p. 91)

Alluding to the fluid transition between production and consumption, he goes on to write that production creates ‘the stimulus of consumption, the ability to consume, as a need. This last identity . . . [is] frequently cited in economics in the relation of demand and supply, of objects and needs, of socially created and natural needs’ (ibid., p. 93). It may be restricted, ‘production, distribution, exchange, consumption’ are not ‘identical,’ but together they form ‘parts of a totality’.

But even in the *Grundrisse*, Marx does not manage to critically understand the interaction of this totality. In the most exquisite romantic German manner, product and consumption are indeed interdependent, like a work of art and its observation. In the introduction to *Grundrisse*, Marx even asks how it is possible for human beings, imprisoned in their modern form of life, to enjoy ancient art, poetry, and mythology and to allow the ancient world to rise up before them. However, more prosaically, no account here is taken of what happens when a product is marketed.

Consideration of circulation times is, accordingly, abbreviated. In *Grundrisse*, we already come across the formulation ‘The velocity of turnover therefore—the remaining conditions of production being held constant—substitutes for the *volume* of capital’ (ibid., p. 519). Marx also remarks here that speed could be replaced by mass and mass by speed not only during capital circulation but even earlier in monetary circulation; this law holds true in production, as well as in mechanics. And he asks, ‘Does not a moment of value-determination enter in independently of labour, not arising directly from it, but originating in circulation itself?’ (ibid., p. 519). On this point, endless statements become entangled and testify to inner doubt; how often Marx returns to the question of circulation can be gathered from his ‘Review of my own notebooks’ (ibid., p. 962 ff.). Each material specification leads him back to problems of material production. When struggling with circulation costs, for example, he also manages to speak of ‘transport costs’ (ibid., p. 522 ff.). The question therefore arises of whether roads should not be publicly financed – an additional problem in our consideration of circulation costs. However, the private construction of infrastructure is a flourishing business – the railways, for example. But this avoids the problem of what circulation does: transportation is actually a form of production.

He returns to the ‘Influence of circulation on the determination of value’ (ibid., p. 537) and admits, ‘Thus a moment enters *into value-determination* which indeed does not come out of the direct relation of labour to capital’ (ibid., p. 538). However, he continues dogmatically: ‘*Circulation time* is therefore not a positive value-creating element’. The speed of capital turnover alone, before introducing the rate of interest, should suffice, together with the corresponding increase in the production of surplus value, to explain the tendency to shorten circulation times without first having obtained an idea of what actually determines the lower limit of the circulation time and of what the unavoidable costs of circulation actually consist.

Marx considers ‘*All forms of credit*’ an aid to reducing circulation time (*ibid.*, p. 542). However, the upper limits to lending cannot be identified without considering the risk, the subjective element of which (trust!) cannot be avoided. With the labelling of an element of the modern finance system as ‘fictitious capital,’ introduced in the third volume of *Capital*, Marx identified an enormous and acute problem but did not solve it. Just as the belief that circulation was unproductive distorts the consideration of real marketing problems, the phrase ‘fictitious capital’ makes it more difficult to make a differentiation between appropriate and speculative evaluation of debt instruments and stocks.

Marx as the darling of modern economics: the reproduction schemes

Certainly, no special evidence is required to argue that the second volume of *Capital* is not read as frequently as the first and third volumes. If the history of reception is taken into consideration, however, it will be seen that the third section of the second volume has prompted numerous publications and to this day continues to play a conspicuous role in the history of economic thought. On one hand, it was a starting point for various debates over the transformation problems, and, on the other hand, it has played an important role among Marxists, as well as ‘bourgeois’ economists in discussions over the correct representation, analysis, and monitoring of the stability of growth. Marx indeed developed a schema of simple and expanded reproduction represented in values, but the exchange relationships between sectors soon raised the question of how they are turned into prices for the purpose of analysis. The characterization offered him the opportunity to examine more closely the structural shift that occurs in a growth process when a consumer goods sector is made more productive through the intensification of capital investment. But first, the pace of growth in the capital goods sector itself must accelerate. The Russian economist Feldman developed a model of forced growth in a capital goods sector, in order to show how a country undergoing development could reach a higher level of production by sacrificing consumer interests at the beginning of the process. This model still played an important role in a Western textbook in the 1970s (Robinson and Eatwell 1973, pp. 288–92), and in certain respects it anticipated Stalin’s policy of forced economic growth in the Soviet Union. Finally, modern growth theory, reconsidering the Marxian schema, rediscovered and acknowledged the original source of its own efforts. This branch of growth theory began with the Harrod-Domar model, which was still a one-sector model, and during the 1950s, it was much discussed. Two-sector models were then introduced, and it was discovered that these were particularly well-suited for the analysis of stability problems of the kind Marx had identified.

Samuelson’s discussion of this third part of *Capital* was almost enthusiastic (Samuelson 1979). While the New Left was losing its interest in the mature Marx, the ‘Leontief-Sraffa Analytical Literature’ turned to the Marxian schemata of simple and expanded reproduction. Here, Marx went beyond the illustrious Quesnay, and Samuelson reproduces several of the schemata. One example should suffice (*ibid.*, p. 233):

Scheme of simple reproduction

Department I 4000 of c_1 + 1000 of v_1 + 1000 of m_1 = 6000 (capital goods)

Department II 2000 of c_2 + 500 of v_2 + 500 of s_2 = 3000 (consumer goods)

Samuelson treats the volumes immediately as physical quantities and speaks of 'coal' and 'corn.' Marx, however, had placed great value on interpreting capital as self-valorising value and had distanced himself from the corn models of the Ricardo school (Schefold 2004b, p. 910, 'Introduction').¹⁰⁰

Samuelson reproduces the exchange relations, discovered by Marx, between the sum of variable capital and surplus value in the first sector and, correspondingly, the constant capital of the second sector. The familiar notation, according to which the sum of variable capital and surplus value in the first sector must be as large as the constant capital in the second, is represented in the oft-cited formula $v_1 + m_1 = c_2$.

Samuelson then passes on to the consideration of expanded reproduction, following the examples of Kalecki, Kaldor, and Robinson, and assumes that all capitalists save and invest, for example, 50 per cent of their surplus value: uniform growth would then result with a uniform composition of capital. The difficult questions, however, are how one moves from one state of growth into another, and which of these growth conditions should be viewed as stable – problems which even today cannot be considered as entirely solved.

We cannot here go further into a discussion of the treatment of growth by Samuelson and other modern interpreters such as Morishima. Instead, we will ask the question: why has the last part of the second volume of *Capital*, together with other Marxian concepts in the first and third volume, had such a powerful effect, while the first and second sections of the second volume have turned out to be far less stimulating? I would like to make three suggestions.

1 The modern counterpart to 'Circulation of Capital' is the analysis of the flow of national income. In its Keynesian form, empirically supported in particular by national income accounting, it deviates from Marx with good reason: the social product does not include the Marxian form of constant capital, except in the form of gross investments. Additional net investments mean growth; their level represents the most important influence on dynamic analysis. As for the rest, constant capital consists of outlays which should not be included with the product because they are put back into production in the same period. In Eastern Bloc countries, the inclusion of constant capital or inputs of intermediate consumption in national income accounting contributed to overinvestment.

Marx correctly understood the problem that fixed capital is simultaneously stock and flow. In the case of machines of constant efficiency, our formulas (14) and (15) illustrate how the influence on prices of stocks of fixed capital can be represented as amortization in a flow calculation. Marx shows how the turnover of fixed capital with a long lifetime is intertwined with that of the turnover of

circulating capital, but he does not develop separate formulas for the calculation of national income and national product or for the calculation of prices – which includes amortization in (14) – or for the structure of capital assets as a whole. Whoever works on national accounts could still refer to Marx as a forerunner in the working up of the necessary distinguishing characteristics, but, as far as I can tell, this connection is hardly mentioned in the literature on the subject.

In contrast, there is the other way to represent circulations: as described within the framework of input-output analysis, where frequent reference is made to Classical concepts. Leontief himself referred to the Physiocrats in particular; Marx was also there in the background (Kurz and Salvadori 2006), and we know today that the younger Sraffa was more strongly influenced by the Physiocrats than Ricardo or Marx, as important as these two were for him. Compared to input-output analysis, the level of aggregation of the reproduction schemes is too high, and that of Marx's representation of the circulation of individual capitals too low. It did not occur to Marx to create an input-output table, though it would have been an idea closely related to his own.

2 In his *Geschichte der Volkswirtschaftslehre* [History of Political Economy], Edgar Salin (1923) discusses the difference between an 'intuitive theory' (*anschauliche Theorie*), often translated as 'visual theory', and a 'rational' theory. Rational theorists take an analytical-deductive approach, as did Ricardo and the Marginal Utility School, each in their own way, while intuitive economists such as those of the Historical School work phenomenologically and descriptively. Actually, however, intuitive theory should encompass rational theory; Smith, Marx, and Keynes stand out in this regard. In modern Neoclassical Theory, rational theory is based upon the rationality principle and on methodological individualism. Here, there are no historical tendencies which could not be derived from the behaviour of the individual subject in the context of the system of conditions in which they existed. The Historical School, by contrast, employed collective concepts and organizational comparisons which allowed them to speak of economic stages and, later, economic styles, to see the connection of technical advance with changes in customs; and let themselves be guided in research and policy by empirical generalizations, such as a law of increasing state expenditure.

Marx was closer to the Historical School than he was willing to admit. Capitalist accumulation might be driven by the pursuit of surplus value, which has its origin in profit maximization, but his capitalists are also capable of irrational acts. More important, however, is the amalgamation of historical tendencies with a conception of value and price essentially compatible with the rationality principle. He situates this, however, differently than would a Neoclassical economist, for instance, when he deals with the production of relative surplus value. This is not derived from profit maximization, for it is not the choice of any technologies which increase the profit rate; it is instead a choice of techniques which appeared as an expression of the opposition between capital and labour. If entrepreneurs can no longer increase absolute surplus value, lengthening the working day, then they

must seek their refuge in the production of relative surplus value, and this means to lower real wages through reducing the prices of wage goods in production. This extremely suggestive 'visual' and 'intuitive' construction can partially – but only partially – be expressed in formal analysis. It is, however, not merely a historical generalization. It actually represents an attempt at connecting intuitive and historical methods with the rational method.

With his hypothetical or dogmatically established tendencies, such as the transition of production of an absolute surplus value to that of relative surplus value, Marx in part caused a furore and in part quite clearly shot wide off the mark. He represented unfettered forces, so to say, dialectically, as in a staged battle, if the issue was, on one hand, immiseration and, on the other hand, the falling profit rate. The laws were mutually exclusive – but where was the harm? Impoverishment in developing countries was obvious, the falling rate of profit occasionally appeared in advanced countries, and overlaps and fluctuations were observed and also overlaps and constant trends: Marxian terms have always set off raw, empirical data on a strange, suggestive life of their own.

However, the first two sections of Volume II of *Capital* appear to contain few such hypotheses, although, as I hope to have shown, an expansion of the limitations of production and consumption, as suggested in the *Grundrisse*, could have led to a more interesting dramaturgy for the character masks acting on the markets.

3 When we look around to see who is following the, as it were, metamorphosis of capital, it is less among economists or Marxists who hold firm to the terminological apparatus of *Capital* that we turn up anything, but rather among journalists, sociologists, and – business managers, whether the topic is risk in financial markets or problems in marketing. Perhaps selling is more difficult than producing – one comes after the other. In any case, the sphere of sales is constantly expanding, while more conventional labour and production shrinks, relatively, even though the service industry is regulated by the harsh law of the market. It almost appears as if Marx did not want to understand that. As much as we admire him as an original theorist in other respects, he remains conventional here, and we cannot help finding his judgment of commercial capital just as strange as he himself found the Physiocratic understanding of manufacturing.

Notes

1 Cf. Letwin (1963, p. 149).

2 Cf. Yolton (1977, 'Introduction').

3 Cf. "William Petty's *Political Arithmetick*, in Schefold (2016c, pp. 226–38).

4 Cf. on this Mabbott (1973, p. 147).

5 Cf. Priddat (1988a, ch. II 5.4, pp. 91ff.).

6 Locke uses both terms ('interest' and 'use') interchangeably, as was common usage in his century (*Oxford Dictionary*).

7 Cf. Locke (1991, p. 216).

8 Locke (1991, p. 234). Defining the 'intrinsic value' of precious metal by its 'quantity' constitutes a *contradictio in adjecto*, as an astute reader of the text, James Bonar, rightly criticised: Bonar (1967, p. 97); cf. Locke (1991, p. 235) and Leigh (1974).

- 9 Cf. Hutchison (1988, pp. 71–2).
- 10 Cf. Spiegel (1971, p. 156).
- 11 The forerunner of the Rijksbank Nobel Prize, so that when the 'Alfred Nobel Memorial Prize' for Economics was introduced, Sraffa was no longer eligible for it; *On Sraffa*, cf. Schefold (1996a).
- 12 Sir Roy Harrod, one of the two great rivals at Oxford, when publishing his own lectures on money that had been given for nearly fifty years and constantly revised, a work therefore that also required many years to be completed, jokingly cites Sraffa's edition of Ricardo with the formulation: 'D. Ricardo, *Collected Poems*, edited by P. Sraffa' (Harrod 1969, p. 25).
- 13 Sraffa (1966b, p. 5) reconstructed the following data for the publication of the pamphlets from contemporary announcements in newspapers:

3 February 1815: Malthus, *Inquiry into Rent*
 10 February 1815: Malthus, *Grounds of an Opinion*
 13 February 1815: West, *Essay on the Application of Capital to Land*
 24 February 1815: Torrens, *Essay on the External Corn Trade*
 24 February 1815: Ricardo, *Essay on Profits*

- 14 This essay also includes mention of West's publications in the field of jurisprudence.
- 15 Among Torrens's (ibid., p. 429) economic policy recommendations for the stabilization of the self-reproducing system is the principle 'With respect to the encouragement of industry and the progress of wealth, steady and consistent legislation, even though it should proceed upon erroneous principles, is preferable to a timid and irregular application of the soundest theories.' Perhaps he is speaking after consideration of his military experience.
- 16 Particularly worth mentioning are the work by J. R. Salis (1932), which has won a prize from the French Academy; the work by A. Amonn (1945 and 1949); and the catalogue by A. Berchtold and Leila el-Wakil (1991), which is nicely illustrated and contains documents, as well as references to more recent research and to conferences on Sismondi. The biographical information presented in the following passage is mainly based on Berchtold and el-Wakil.
- 17 See Sismondi (1971).
- 18 See Berchtold, in *Berchtold and el-Wakil* (1991, p. 22).
- 19 See Sismondi (1971 [1819]). This common edition only contains the first part of the work (books I–IV). The first full English translation is Sismondi (1990).
- 20 Vols 1 and 2 appeared in 1839 (Paris: Treuttel and Würtz). A posthumous 3rd volume, ed. by E. Robinet and also published by Treuttel and Würtz, completed the work in 1844. See Sismondi (1839).
- 21 Cf. Priddat (1988b).
- 22 Cf. '*Avertissement de la seconde édition*', in Sismondi (1827, pp. 50ff.).
- 23 The letter is reproduced in Ricardo (1965, vol. VIII, p. 375).
- 24 Cf. Denis (1974).
- 25 Cf. e.g. Allan (1968).
- 26 Cf. Skourtos (1991).
- 27 Cf. A. Parguez (1973). Parguez shows very nicely, in particular, how Sismondi contrasts the problems of market coordination with the decisions of a single, independent producer, which are trivially consistent. According to this account, in Sismondi's theory the possibility of a disequilibrium rests not only on a temporal structure, but also on the incompleteness of information available to the entrepreneur regarding future demand and the production plans of competitors (see Parguez 1973, p. 852). Indeed, Sismondi writes in his *Nouveaux Principes* (Sismondi 1990, p. 254): 'The isolated man's knowledge of his own means and his own wants, required to be

replaced by a knowledge of the market, for which the social man was labouring; of its demands and its extent. The number of consumers, their tastes, the extent of their consumption, and their income, regulate the market for which every producer labours. Each of these four elements is variable, independently of the rest, and each of their variations accelerates or retards the sale.'

- 28 Cf. Spiegel (1971).
- 29 On this, see the introduction by J. Weiller, in Sismondi (1971 [1819]).
- 30 'Das effiziente Wissen', cf. Dotzler (1991); 'Knacker aus Metall', a two-page article in *Der Spiegel*, 8 July 1991.
- 31 Cf. (Babbage 1835).
- 32 These and the following facts are taken from the catalogue by Doron Swade (1991), *Charles Babbage and his Calculating Machine*, Science Museum, London.
- 33 The other side of the coin is that industrial production is altogether more difficult where reproduction technologies are not yet introduced, as Babbage experienced at first hand: 'Babbage's failure to complete his ingenious scheme [i.e. the Analytical Engine, B.S.] was due to the inability of the technology of his day to deliver the components which were essential to the machine's success.' Rosenberg (1985 [1976]), p. 276.
- 34 The chapter 'On the division of labour' calls this division the most important principle of an 'economy of a manufacture'.
- 35 Cf. Pagano (1991).
- 36 See especially the chapter 'On contriving machinery', in which the systematic development of an invention is described. Cf. Babbage (1835).
- 37 Rosenberg (1985 [1976], p. 313) traces this thought back to the early Marx (*The Poverty of Philosophy*), and from there to Babbage.
- 38 Cf. Stigler (1991) and Babbage (1835, p. 212).
- 39 Cf. Stigler (1991, p. 1151); Babbage (1835, pp. 253f.).
- 40 Cf. Cournot (1838, p. 41). I owe this reference to R. Theocharis.
- 41 Cf. especially Hodgskin (1825).
- 42 An early version of this essay appears as the Foreword to Karl Marx, *Das Kapital*, Dritter Band 2004 [1894]), Apparatus in K. Marx and F. Engels (2004 [1894]), *Das Kapital. Kritik der Politischen Ökonomie*. Dritter Band, Gesamtausgabe: MEGA2 II/15, Berlin: Akademie Verlag, pp. 871–910; a second, expanded version was presented at the international MEGA2 Colloquium, *Die historisch-kritische Edition von Marx' "Kapital" in deutsch-japanisch-russischer Forschungskooperation*. The present version is the result of yet another revision; the German version was published as 'Die Bedeutung des Problems der Wertformenlehre und der Transformation von Werten in Preise für das Kapital', in *Marx-Engels Jahrbuch* 2007 (publ. 2008), pp. 34–92.
- 43 Cf. the next essay.
- 44 English version in Part III of Schefold (1989a).
- 45 Cf. 'Aristotle: the Classical thinker of ancient economic theory', in Schefold (2016c, pp. 31–51).
- 46 Cf. Sahlins (1972), Mauss (1983) and Gregory (1982).
- 47 Cf. 'Nicholas Oresme: monetary theory in the late Medieval era,' in Schefold (2016c, pp. 75–103).
- 48 Cf. Marx (1909, ch. 2). 'These have one mind, and shall give their power and strength onto the beast' (Revelation 17, 13; then ironically combined with Revelation 13, 17).
- 49 Cf. 'Asian classics in a Western collection of the history of economic thought', in Schefold (2016c, ch. 5).
- 50 See the German editions of 1867, 1872, 1883, and 1890, together with the French (1872–5) and English (1887) editions reprinted in MEGA II/5–10.
- 51 See Marx to Louis Kugelmann, 28 December 1862. Here Marx refers to the development of the so-called Six Book Plan. Cf. Marx (1952).
- 52 This is suggested, for example, in his remarks in a letter to Louis Kugelmann of 28 December 1862. Cf. Marx (1952).

- 53 See Marx (1983 [1867] pp. 244–45). He also raised the issue in the 1864–5 draft of vol. III: ‘it thus appears that the *theory of value* is incompatible with the *real movement* (irreconcilable with real production phenomena) and that to comprehend the latter we must do without the theory of value’ (Marx 1992, p. 230. 6–9).
- 54 See Howard and King (1987); Quaas (1992).
- 55 Cf. Meldolesi (1987).
- 56 Some efforts of this kind can be found in the attempted solutions provided by Sweezy (1942), Meek (1956) and Langston (1984, pp. 1–11).
- 57 Cf. ‘William Petty’s political arithmetick’, Schefold (2016c, pp. 226–38).
- 58 For an English translation of the 1925 article, see Eatwell and Roncaglia (1998).
- 59 Cf. ‘The Pamphlets from 1815’, present edition, pp. xxx.
- 60 See, for example, the pithy formulation: ‘*Die Arbeit nach einem fremden Willen ist α) das Abtun der eigenen Besonderheit derselben, β) eine Bearbeitung der Dinge oder eine solche negative Beziehung des Selbst auf sie, welche zur Form der Dinge wird . . . und sich selbst ein solches Dasein gibt.*’ (‘Labouring for an alien will is a) a denial of one’s own particularity, b) a processing of things or such a negative relation of self to them that it assumes the form of things . . . and endows itself an existence as such’) (Hegel 1970, p. 82).
- 61 See on the following Schefold (1996b).
- 62 We will not here discuss the extensive literature on the reduction of complex to simple labour; we can cite as an example Rainer Zech (1978).
- 63 See the reference in the Index volume of the Ricardo edition to ‘utility: the foundation, not the measure of value’ (Sraffa and Dobb 1951–73, vol. 11, p. 106).
- 64 Marx translated ‘supply’ with *Zufuhr*, ‘input’, whereas the accepted term is now *Angebot*, derived from ‘offer’, which is also the term used in French – cf. Groenewegen (1973).
- 65 Cf. ‘The Pamphlets from 1815’, present edition, pp. 28–41. To explain the fall of the general rate of profit on the basis of competition, as Smith did, as consistent with his view of adding-up the components of prices, but at odds with the idea of a given surplus and given wages. If profits fall, wages must rise with a given technique.
- 66 Cf. Quaas (2000).
- 67 First suggested, before Steedman, in Morishima (1973). This was based on John von Neumann (1937).
- 68 This criticism can be traced back to Joan Robinson (1966a), was formalised by Paul Samuelson (1971) and reinforced by Ian Steedman (1977). Since this was written, I have discovered that the Marxian idea of regarding the masses of surplus value and of profits as equal ‘on average’ can be justified, if the system has random properties, but this important special case cannot be discussed here. Cf. Schefold (2015).
- 69 Cf. ‘Rudolf Hilferding and the idea of an organised capitalism’, present edition, pp. 157–177.
- 70 Cf. Hindess and Hirst (1975).
- 71 See, for an overall discussion of this, Itoh and Lapavistas (1999).
- 72 Cf. ‘Thomas Tooke’s *An Inquiry into the Currency Principle* and the theory of distribution’, present edition, pp. 131–147.
- 73 See, for example, Eichner (1979).
- 74 See also Plasmeijer (1998).
- 75 Cf. ‘Leonard Lessius: from the practical virtue of justice economic theory’, vol. 1, pp. 127–53.
- 76 ‘*Zins als Preis des Kapitals ist von vornherein ein durchaus irrationaler Ausdruck. Hier hat eine Waare einen doppelten Werth, einmal einen Werth, und dann einen von diesem Werth verschiedenen Preis, während Preis der Geldausdruck des Werths ist*’ (Marx (2004 [1894]), pp. 345.35–346.1).
- 77 Xenophon treated entrepreneurial leadership as a great art, and Columella recognises the risk involved in delegation. Cf. ‘Xenophon’s *Oikonomikos*: the beginning of an economic science?’ in Schefold (2016c, pp. 14–31).
- 78 Compare Marx (2004 [1894], pp. 409.29–34) and Marx (1992, pp. 483.19–23).

- 79 At least as interpreted by Marx; see Rieter (1971).
- 80 Marx (1992, pp. 522.1–2), Marx (2004 [1894], p. 463.27). ‘*Verrückt*’ has a double meaning in German of ‘crazy’ and ‘displaced’.
- 81 Marx (1992, pp. 587.7–12). [Italics mark English in original; note that this is translated from Marx’s manuscript of vol. III, not from vol. III as edited by Engels.]
- 82 Cf. ‘The Pamphlets from 1815’, present edition, pp. xxx.
- 83 Cited throughout as Marx and Engels (2005 [1884/85]).
- 84 The accompanying remarks explain that the term ‘capitalism’ does not appear elsewhere in the three volumes of *Capital*. Instead, Marx speaks of ‘capitalist mode of production’ and similar constructions; Following citations from Marx and Engels (2005 [1884/85]) will be stated in brackets.
- 85 Cf. ch. 2, in *Great Economic Thinkers from Antiquity to the Historical School*.
- 86 Even at the psychological level, the rationality postulate is problematic (Ainslie 1992).
- 87 We are following here the first edition after the text: Marx (1983 [1867]). The translation here is from Marx (1990 [1887], p. 29).
- 88 On the older approach to use-value, I refer the reader to Schefold (1999).
- 89 Cf. ‘Xenophon’s *Oikonomikos*: the beginning of an economic science?’, vol. 1, pp. 14–31.
- 90 From an ironic distance: Bourdieu (1982).
- 91 Cf. Kurz and Salvadori (1995); Schefold (1997e).
- 92 See Schefold (2004b) and the previous essay in this volume.
- 93 Marx and Engels (2005 [1884/85], p. 107). The attribution to Hildebrand is confirmed in the apparatus.
- 94 See ‘Bruno Hildebrand: the historical perspective of a liberal economist’, vol. 1, pp. 264–84.
- 95 The sentence appears in a passage extracted by Engels from a Marxian manuscript, reproduced in Marx (2012, p. 357).
- 96 Schefold (1980), circulated as a memo in 1974, p. 97; Italian trans. ‘*Capitale fisso, accumulazione e progresso tecnico*’, in Schefold (1977, pp. 195–299); German trans. ‘*Fixes Capital als Kuppelprodukt und die Analyse der Akkumulation bei unterschiedlichen Formen des technischen Fortschritts*’, in Schefold (1979, pp. 203–305).
- 97 Marx and Engels (2005 [1884/85], p. 151). In my dissertation, I suggested the expression ‘perennial machines’ (Schefold 1971, p. 134). The same in Schefold (1989a, p. 378).
- 98 See, for example, Nell (1998). This form of analysis of circulation draws on analysis of growth during the transformation of economic structures (see part III, in particular).
- 99 Marx, *Grundrisse*, MEGA2 II/1.1 and II/1.2; we here quote from the translation by Martin Nicolaus: Marx (1981 [1937]).
- 100 See previous essay.



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Monetary Theory

Thomas Tooke's *An Inquiry into the Currency Principle* and the theory of distribution

It is said that all important arguments of modern monetary theory were already discussed in the nineteenth century – with the possible caveat that the construction of concrete models was rare and the use of concepts fluctuated. Such disadvantages, however, were partly offset by the advantage of much greater clarity in presentation. The latter was owed not just to the question of academic style, but also to the fact that the empirical givens were much simpler. You could watch precious metal circulating. The wealthy man felt the weight of gold in his pocket, and everyone knew that this current asset, which was indispensable to a society based on the division of labour and the guarantor of the long-term stability of price levels, had been dearly bought. It was substituted with coins minted below value using cheaper metal, with notes, cheques, and bills of exchange. Thus, the questions emerged over what form of money constitutes the real money, what determines its value, and whether certain types of credit cause economic crises or, at least, lead to their aggravation.

The debates reached their pivotal point with the Banking-Currency Controversy. As in many other cases, it was triggered by the legal regulation of banking. The two main events are associated with the name of Robert Peel. In 1797, the convertibility of the English pound into gold had been suspended in connection with the Napoleonic Wars, and in 1819, John Peel pushed through Parliament the return to its convertibility, which was then established by the Bank of England by 1821. On the initiative of Peel, the Bank of England was reformed in 1844, and the issue of notes was separated from the rest of the Bank's operations. The Bank was allowed to issue only a certain volume of notes. Any further emission of notes was meant to be tied to gold backing. Otherwise, it was feared, inflation might be the consequence. Thomas Tooke, with the support of Fullarton, opposed the circulation theorists and adherents of the currency principle – the most important representatives were Torrens, Norman, and Lloyd (Lord Overstone) – who were in favour of this rigid regulation. The Banking School assumed a given level of prices to which the quantity of money adjusts. It believed that in normal times, the expansion of the credit volume and, in particular, of the emission of notes by private banks, which it considered to be part of credit, would be self-regulating. It therefore saw less reason for restrictive policies implemented by

the central bank, and it feared that during times of an economic downturn, a rigidly fixed upper limit for the emission of notes by the central bank might put at risk the redemption of credits granted in times of economic upturn and thus could deepen the crisis.

An *Inquiry into the Currency Principle* (Tooke 1959 [1844]) turned out to be the most striking contribution to the debate. Within the sub-set of the *Klassiker der Nationalökonomie* [Classics of Economics], which presents the English debates on monetary theory and monetary policies, Tooke finds his place between Smith and Ricardo, on one side, both of whom are also important for monetary theory, and John Stuart Mill, Bagehot, and Wicksell, who himself still reacted to and was influenced by Tooke, on the other. Although Wicksell was no Englishman – his *Geldzins und Güterpreise* [Interest and Prices] was originally written in German – regarding the substance and influence of his work he belongs to the English tradition which leads further on to Keynes and whose beginnings one could date back to Locke and Stuart, all of whom are part of the *Klassiker der Nationalökonomie*. Tooke's *History of Prices* (1928) is undoubtedly even more renowned as a monumental classical text, compared to the *Inquiry*. However, the latter has been given preference here not only because of its more modest proportions, but also because of the historical role it played as a pamphlet. Even Wicksell still found it convenient to use it for a perspicuous presentation of the position of the Banking School.

There is rich evidence for Tooke's historical significance. Let me just mention his influence in Germany, which is documented, in particular, through Wagner's (1873) thorough engagement with English monetary theory (Wagner 1862) and banking legislation (Wagner 1977). More than twenty years ago, Heinz Rieter already demonstrated how current theories of inflation can be related to Tooke (Rieter 1971). Arie Arnon wrote a historical monograph on Tooke (Arnon 1991), and Massimo Pivetti has based a further development of distribution theory which determines the rate of profit with the help of the rate of interest on Tooke and Wicksell.

Tooke's multi-layered work makes it generally difficult to do justice to it.

Tooke's mature conceptualisation appears in its most elaborated form in the famous 1844 pamphlet *An Inquiry into the Currency Principle*. This pamphlet was received with great interest by Tooke's contemporaries who saw it as a definitive criticism of the Currency School conceptions.

(Arnon 1991)

Tooke's engagement with Torrens, his influence on Mill, and his selective reception by Karl Marx are of more than just historical interest, while the theoretical questions one may wish to ask in connection with his work will most likely find a satisfactory answer if one considers their historical context. This applies, for instance, to the question of the correct definition of money, of the degree to which the quantity of money is determined endogenously, of the role credit plays within the economic cycle, and of the influence of the balance of payment on the quantity of money or of income on prices.

Let us look, for example, at privately emitted bank notes, one of the controversial points in the debate. The Banking School subsumed it under credit, the Currency School under money. For Tooke, the significance in making this distinction was that money circulates in the sphere of income and consumption, while credit essentially plays a role in transactions between entrepreneurs and merchants.¹ The historical background to the distinction was that wages were predominantly paid in coins and these, in turn, were spent on consumer goods, while the exchange between entrepreneurs and merchants was mediated by letters of credit or bank notes of a high denomination (notes with low denomination were undesired).² If those bank notes which were of a higher denomination (according to the ruling norms) did not enter into the circulation between wages and expenditure, the Banking School argued, they could not possibly exert a direct influence on the prices of essential consumer goods. This argument explains the school's rejection of quantity theory.

Circulation between merchants and entrepreneurs, by contrast, Tooke considered to be mediated by credits, which were normally covered by available goods. During a crisis (the causes of which, for Tooke, must be sought in the real economy), these credits were at risk of default, in which case they accelerated the economic downturn. Tooke anticipated that in such a situation, the Bank of England would have to restore solvency by raising the emission of notes (as, indeed, happened under a suspension of Peel's law and as was later described by Bagehot), while the Currency School categorically abided by its principle of a limit to the emission of notes because it considered the excessive issuing of notes a disturbing factor.

Tooke's distinction between means of circulation and capital – in essence, a distinction between those transactions that take place over the counter and those that take place behind it – makes sense and is understandable within the institutional context, but it confuses the problem that in both spheres money circulates in different forms, with the separate opposition that in one case, it is income, and in the other, capital, that is expended. The different forms of money stand in no necessary relation to either the distinction between the spheres or the opposition between the expenditure of income and capital.³ Customary forms of payment changed across the centuries and did not follow the same rules in England and Scotland. In reality, notes of small denomination were not excluded in principle and everywhere. However, a conceptuality that would clarify the questions raised by Tooke's distinction has still not emerged even today; the reach of the concept of money remains controversial.

The assumption of prices that are determined independently of the quantity of money provides a comparatively simple access to the main elements of Tooke's theory. This is the path I would like to follow here, in order to make a contribution to the theories that drew on Tooke, although we should bear in mind that Tooke did not unambiguously follow Ricardo's theory on prices, under which the level of prices is indeed already fixed by the assumption that the purchasing power of precious metals serving as money also corresponds to the cost of its production. Tooke's pamphlet of 1844, without a doubt, belongs to the tradition of Smith and

Ricardo, even if its theory of prices cannot be precisely established. However, given a pre-determined level of prices, it is clear that it is not changes in the quantity of money that regulate prices, but, on the contrary, conclusions must be drawn from prices to the quantity of money that may circulate. Tooke illustrates the connection using the example of precious metals, which may move from industrial into monetary use, as well as from the monetary into the industrial. Notes not covered by precious metal, such as those circulated in England after the gold standard had been suspended during the Napoleonic Wars, he excluded from his argument. But he does show how the volume of notes emitted by private provincial banks (which he does not, however, count as money) expands and contracts with the volume of trade, without its quantity standing in a close relation to the gold standard. In that sense, the quantity of endogenous money (applying the modern distinction) may oscillate without any significant effect on interest rates and without affecting the exogenous activities on which it passively depends. However, the insolvency of debtors caused by a sales crisis and aggravated by a loss of trust, will lead to a rise of interest rates, which, in turn, contributes to a reduction in economic activity.

As Tooke's famous thesis succinctly puts it:

12. That the prices of commodities do not depend upon the quantity of money indicated by the amount of bank notes, nor upon the amount of the whole of the circulating medium; but that, on the contrary, the amount of the circulating medium is the consequence of prices.

(Tooke 1859 [1844], p. 123)

On the supply side, Tooke sees prices influenced by the costs of production; on the demand side, by the quantity of money which mediates it. The costs depend, among other factors, upon the level of interest on which Tooke formulates the following thesis:

14. That a reduced rate of interest has no necessary tendency to raise the prices of commodities. On the contrary, it is a cause of diminished cost of production, and consequently of cheapness.

(Tooke 1859 [1844], p. 124)

At this point, a contradiction appears between Tooke's reference to falling interest rates as causing a fall in prices – thus, rising interest rates causing a rise in prices – and his observation that during crises (in his times, accompanied by falling prices), interest rates rise. His contemporaries already remarked on this, and Tooke himself was confronted with an analogous contradiction arising in connection with his statements about balance of payments. He claimed that in the case of weak balances, banks needed to raise interest rates in order to effect a fall in prices, which makes the import of gold through the export of goods more lucrative. Tooke attempted to resolve the contradiction, on one hand, by distinguishing between short-term and long-term effects (production costs only determine prices in the long-term) and, on the other, by invoking the effect of monetary restraint

on credit relations and thus on economic activity, which is slowed down and leads to lower prices (we may add that the level of imports necessarily diminishes, along with that of economic activity). In a footnote, Tooke says,

I have expressly assumed that the reduced rate should be of such duration or permanence as to enter into the cost of production, and the converse holds of a rise in the state of interest. Now, the operation of the Bank in raising the rate in order to counteract a drain, cannot be considered of such permanence as to affect the cost of production. And the greater the rise in the rate of interest from a forcible operation of the Bank on its securities, the less must be the probability of its duration. But there is a further and still more decisive answer to the objection and that is, that although the direct operation of the Bank, with the view supposed, is on the rate of interest, it can rarely be effectual, unless the advance be so great, or the circumstances from previous overtrading such as to affect credit and entail failures. Now, commercial discredit, involving extensive failures, is calculated to depress prices, and thus, with an advanced rate of interest, to stop a drain and to force an influx of bullion.

(Tooke 1959 [1844], pp. 123–4)

There will hardly be an economist who would deny that a tightening of credit has a dampening effect on the economy. But that changes in interest rates and in the level of prices point in the same direction when looked at over longer periods is a much rarer claim, although the observation has been made several times. Today, it is called Gibson's paradox. Keynes spoke of it as an empirical fact with regard to nineteenth-century England and dedicated an investigation to it.⁴ Fisher explains the fact with an increase in the rate of interest that is accelerated by expectations, following, or even anticipating, economic strain causing inflationary tendencies.⁵ Wicksell intended to resolve the paradox with his theory of interest margins. I shall try to capture the effect in a quantitatively more precise way with a possibly novel approach.

Long-term changes in the rate of interest are connected to changes in the functional distribution of income. In his critique of Tooke, Wicksell, as a Neoclassical theorist, assumed a natural rate of interest, which, in the long-term equilibrium, corresponds to the marginal product of capital. If a lower rate of interest forms within the banking system, the margin between the rate of interest for money and the natural rate of interest leads to increased demand and, as Wicksell's model assumed full employment, to rising prices (see Schefold 1997g). If, in the reverse case, the money rate of interest exceeds the natural rate, this leads to deflationary effects. For underemployment, Keynes transferred the mechanism to the level of economic activity. Wicksell also revised Tooke's theory by making use of quantity theory in determining the level of prices. Quantity theory gave a fixed value to the level of prices, which would otherwise remain indeterminate when the money rate and the natural rate of interest coincide.

If we want to do justice to Tooke, we need to leave this formula behind. Most economic theories mention separate causes for the determination of the money

rate of interest and interests in the real economy or the industrial rate of profit (see Panico 1987). Apart from the interpretation of the rate of profit as natural interest, there is in particular its classical determination, which looks at profit as a residual surplus after production costs and real wages (which are determined by labourers' subsistence needs) have been subtracted from the total product. Wage shares and profit margins have also been used as starting points. Then there are theories of distribution based on the degree of monopoly power, and finally we have the post-Keynesian theory, which emerged out of the approaches suggested by Kalecki and Kaldor. A comparison of this theory with Tooke is particularly interesting. In my view, it plausibly explains profits in a strongly growing economy in line with Tooke (as far as the demand side is concerned) with the effective demand associated with growth to which correspond savings that result not only from the increase in national income but also from its redistribution in favour of profits, whenever there is sufficient demand.

The approach is fairly well known. Empirically, the propensity to save in the case of profits exceeds that for income from wages several times. For the sake of simplicity, let us assume that the marginal propensity to save in the case of wages equals zero. Call that for profits s_p and the amount of profit P . Then, equality of investments I and savings S gives us

$$I = S = s_p P$$

and divided by the capital stock, we get

$$r = \frac{P}{K} = \left(\frac{1}{s_p} \right) \left(\frac{I}{K} \right) = \frac{g}{s_p}.$$

Thus, the growth rate of capital accumulation, g , determines the rate of profit, r . For a closed economy without state intervention, this formula always applies but acquires causal relevance only during a long stretch of fairly undisturbed economic upturn. As we shall see, profits do not necessarily need to fall in correspondence with a decline in growth, as long as interest rates are high – evidence that under near-stationary conditions, distribution is no longer regulated by demand.

However, let us stay with the case of continuous growth. The profits made in the course of the process we have already alluded to partly take the character of quasi-rents, as they appear in times of economic upturn. Demand allows the raising of prices above the level of costs, and in the case of advanced companies, additional quasi-rents result from dynamic efficiency gains. According to some older ideas, in the long term such quasi-rents are eliminated by competition. However, a period of growth across longer stretches of time will continuously reproduce these quasi-rents, leading to a rate of profit that allows profits to exceed the sum of capital interest and the employer's salary. The margin between profits and interest leads to investment and rising capacities, so that one might expect prices and profits to fall due to the expansion of supply. But the same increased investments are already needed in order to maintain growth at the same constant rate. The margin between demand and supply is therefore reproduced at a higher

level with each economic period and thus stabilises the price level and the existing rate of profits. It can be taken to be the 'normal' rate of profits, although in this case it includes quasi-rents.

Such balanced growth, as discussed by the Cambridge economists, is not necessarily free of any disturbances and oscillations, but it does assume a certain continuity and will not develop spontaneously under conditions of weak growth or stagnation.⁶ It is characterised by a significant margin between the rates of return achieved in industry and monetary rates of interest. The increase in real wages associated with growth has to be adjusted to the increase in productivity and is sustainable only if the increase in money wages does not exceed the point where it becomes incompatible with keeping inflation at a modest level. The pressure from inflation becomes more intense when the limit of full employment is reached without an increase in the labour force's participation rate or immigration, when exaggerated wage demands are pushed through, and under certain circumstances also when competitive pressure decreases or when imports fluctuate.

Whether it was the oil price shock or the wage demands of the trade unions, whether bad government policies or disturbances in the international monetary system – whatever bogged down the economic growth of 1950s and 1960s Germany, which fit this theory of growth and distribution so well, afterwards one felt reminded of the English children's rhyme:

Humpty Dumpty sat on a wall,
 Humpty Dumpty had a great fall.
 All the King's horses and all the King's men
 Couldn't put Humpty Dumpty in his place again.

(Carroll 1970, p. 262)

To the extent that Tooke conceives of the price level as determined by demand, he suggests an understanding of distribution along these lines. To the extent that he sees the price level as depending on costs, it can be interpreted along Ricardian lines in the context of weaker growth or stagnation as follows: industrial entry barriers, which may cause significant margins between rates of return in the real economy and for financial assets, are not considered. In the long term, prices are determined by production costs, which include a normal profit per unit of advanced capital according to the formula

$$r = i + u.$$

where i is the rate of interest, and u is the entrepreneurial profit per capital unit, which is understood in terms of the employer's salary necessary in a specific economic sector; u may thus vary in different branches of industry. It is a remainder after the quasi-rents mentioned previously, which occur in the course of the economic dynamic, have been eliminated by competition. Such an employer's salary, like a calculable risk, in fact represents only one cost element, which we shall at times neglect in what follows. Thus, we get

$$r = i.$$

As the cost of interest burdens individual enterprises in varying degrees, depending on their level of debt, it would make sense to distinguish between the rate of interest at which an enterprise raises capital and the rate at which it may invest capital. However, not without some hesitation, we shall ignore this margin, which can be a significant one. We shall also, again reluctantly, not explicitly distinguish between short-term and long-term interest rates. And first of all, we must assume that the central bank is actually capable of influencing long-term interest rates, if we want to continue Tooke's train of thought.⁷

In the case of individual production, if there is only circulating capital and labour is homogenous, prices follow the equation

$$(1+r)\mathbf{A}\mathbf{p} + w\mathbf{l} = \mathbf{p}.$$

where \mathbf{A} is the input-output matrix, \mathbf{l} is the labour vector, \mathbf{p} the vector for prices, and w the wage rate. As is well known, Sraffa formalised the 'invariable measure of value' that Ricardo had been looking for into a standard commodity $\mathbf{q}(\mathbf{I}-\mathbf{A})$, where \mathbf{q} is the vector for the level of economic activity at which the system could reproduce itself in uniform growth (even if, in fact, growth rates differ or there is stagnation). Thus, we have $(1+R)\mathbf{q}\mathbf{A} = \mathbf{q}$, or $R\mathbf{q}\mathbf{A} = \mathbf{q}(\mathbf{I}-\mathbf{A})$, where the scale for \mathbf{q} is chosen so that $\mathbf{q}\mathbf{l} = 1$. If we measure prices according to this standard, i.e. if we assume $\mathbf{q}(\mathbf{I}-\mathbf{A})\mathbf{p} = 1$, we get⁸

$$1 = \mathbf{q}(\mathbf{I}-\mathbf{A})\mathbf{p} = \mathbf{q}(r\mathbf{A}\mathbf{p} + w\mathbf{l}) = \left(\frac{r}{R}\right)\mathbf{q}(\mathbf{I}-\mathbf{A})\mathbf{p} + w\mathbf{q}\mathbf{l} = \frac{r}{R} + w,$$

hence

$$w = 1 - \frac{r}{R}$$

This yields a linear wage curve, if prices and wage rates are expressed in terms of the standard commodity as a *numéraire*. Prices determined by costs change alongside changes in the distribution. In capital-intensive industries, the value of production must show a relative increase if the rate of profit increases and the wage rate decreases. In labour-intensive industries, by contrast, it must show a relative increase if the wage rate rises and the rate of profit decreases. These changes in prices cancel one another out in such a way that the value of the aggregate standard commodity (by definition) does not change, and the wage rate moves in the simplest form conceivable in an inverse relation to the rate of profit.

This conception seems to refute Tooke's claim that in the long term, prices rise and fall along with the rate of interest. If the rate of interest changes and the rate of profit in the long term follows that change (in our provisional simplification: $i = r$), then the aggregate prices expressed in terms of the standard commodity do not change at all. Tooke, for instance, speaks of the outflow of gold as leading to interest rate rises. In this context, he is interested in the short-term reactions. But even if distribution were to change in the long term, the price of the standard

commodity would remain stable. And the standard commodity is without doubt a relevant economic index. It includes only the so-called basic commodities (goods which enter directly or indirectly into the production of any other good), and therefore so far we are looking only at an indecomposable matrix \mathbf{A} . But we shall soon see that essentially the same conclusion also holds if consumer goods are taken into consideration as well.

Tooke, however, treats the relation between changes in the interest rate and changes in the price level in connection with inflationary processes. Following Keynes, we must therefore consider the wage rate as given because it is constantly renegotiated in times of inflationary processes. Leaving the inflationary process aside to begin with, we now measure the change in prices relative to the wage rate if the central bank influences the rate of interest and the rate of profit and the rate of interest adjust in the long term. Such a long-term rise in interest rates, with at the same time constant monetary wages, is conceivable if a nation, in the wake of a structurally caused deterioration of the trade balance, turns, for a certain period of time, from being a country with low interest rates to one with high interest rates, in order to attract capital investment. For the formation of the average, we use the standard commodity, i.e. express our price index as

$$s = \mathbf{q}(\mathbf{I} - \mathbf{A}) \left(\frac{\mathbf{P}}{w} \right).$$

This expresses, as we could say with Smith, the labour commanded by the standard commodity, because the price of a good in terms of the wage rate – the price in units of wage – expresses, on one hand, the amount of labour per unit of the good, the labour needed to buy (acquire) a unit of the good, while, on the other, it expresses the amount of labour which can be bought (employed) or, using Smith's well-known expression, 'commanded' with a unit of the good at the given rate of pay. We are justified to speak of an index because an expression is given for the aggregate of prices as depending on the rate of profits, just as usually the indices for prices are constructed as depending on time.

It is a well-known result of the classical theory of prices that the prices of all goods, expressed as commanded labour, rise with the rate of profit in systems of individual products. This gives us for the labour commanded by the standard commodity the following simple relation

$$s = \mathbf{q}(\mathbf{I} - \mathbf{A}) (\mathbf{p}/w) = 1/w = R/(R - r).$$

Given our – admittedly distinct and special – assumptions, this shows that the price index expresses a rise in prices relative to the monetary wages, which takes the form of a hyperbola. We get a first idea of the dimension of this rise by differentiating the index with respect to the rate of profit:

$$\frac{ds}{dr} = \frac{R}{(R - r)^2}.$$

The gradient of the function is $1/R$, even at the point where the rate of profit is nil, and increases rapidly as r approaches R . It is even more interesting to calculate the percentage price rise caused by a change in the interest rate or the rate of profit of, for instance, one percentage point. The relative (percentage) change of the index is ds/s , and thus

$$\frac{ds}{s} = \frac{ds}{dr} \frac{dr}{s} = \frac{R}{(R-r)^2} \frac{R-r}{R} dr = \frac{dr}{R-r}.$$

Let us look at a quantitative example in order to illustrate the implications of this. The maximum profit rate of system R equals capital productivity, as I have previously shown.⁹ Thus $R = Y/K$, or: R is the inverse of the capital-output-ratio, which, in modern economies, is roughly 4. It is one of the most stable macroeconomic values and reaches comparative values even for countries that are in different stages of development. Given a 5 per cent interest rate ($r = 5\%$) and a cautious $1/3$ for R , this gives us for a change of interest of one percentage point

$$\frac{ds}{s} = \frac{\frac{1}{100}}{\left(\frac{1}{3}\right) - \left(\frac{1}{20}\right)} = \frac{60}{17 \cdot 100} \approx 0,035.$$

Thus, if the central bank raises the interest rate by one percentage point, as a consequence of the aftereffects of a multiplier, prices rise by 3.5 per cent in the long term. If the 1 per cent increase was introduced at an interest rate of zero, prices would already rise by 3 per cent. If we now also take the employer's salary into consideration as a factor (where $r = i + u$ and $dr = di$), assuming it to be 5 per cent, then, with all other conditions remaining unchanged, we get

$$\frac{ds}{s} = \frac{\frac{1}{100}}{\left(\frac{1}{3}\right) - \left(\frac{1}{10}\right)} = \frac{30}{7 \cdot 100} \approx 0,043;$$

Thus, in this case, the price rise relative to the monetary wages has gone up to 4.3 per cent, or 8.6 per cent in the case of an interest rate rise of 2 per cent. The effect becomes even more dramatic the closer r approximates R (where the multiplier tends towards infinity). In the case of low rates of profit, by contrast, we get:

$$\frac{ds}{s} = \frac{1}{R} \frac{dr}{1 - \left(\frac{r}{R}\right)} \approx \frac{1}{R} \left(1 + \frac{r}{R}\right) dr;$$

That is, in zeroth order approximation, the change in prices is simply $(K/Y)dr$.

At this point, numerous questions arise which we can only touch upon in our short, formal overview. Will the goal to improve the payment balance be achieved in the case of a country that otherwise has no inflation and raises interest rates for the already mentioned reason of a weak trade balance, in order to attract capital, if the higher prices in combination with an unchanged rate of exchange actually make the trade balance worse? What is the connection between an additional rise in prices induced by the central bank and inflationary tendencies which exist independent of it? What implications are there for the money supply? Might there be technical changes over the duration of the price change and as a result of distributive changes? How will changes in distribution affect consumption?

Let us begin with the question of general inflation. The model presented here best explains situations in which the upward movement of monetary wages can be considered as given and impacts on the price level. Then, to begin with, the intervention of the central bank appears to contribute further to inflation. It is justified if the interest rate rise is associated with a lowering of economic activity, which exerts a short-term pressure on wages and prices that reduces the general inflationary tendencies more than prices rise as a consequence of the interest rate rise taken by itself. In that case, there is also the hope that the interest rate rise can eventually be reversed.

However, the wage-price spiral and the explicit distinction between nominal and real interest rates require a more precise analysis.

Let prices in period t be p_t , and be given by

$$\mathbf{p}_t = (1 + g)(1 + u)(1 + \pi)\mathbf{A}\mathbf{p}_{t-1} + w_t\mathbf{l}$$

where g = rate of inflation, π = real interest rate, and u = rate of employer's salary. The nominal rate of interest is $1 + i = (1 + g)(1 + \pi)$, and thus the real rate of profit is given by

$$1 + r = (1 + \pi)(1 + u) = \frac{(1 + i)(1 + u)}{(1 + g)}$$

from which follows

$$dr = \frac{1 + u}{1 + g} di.$$

We also assume that relative prices remain stable and the rate of inflation does not change, hence

$$\begin{aligned} \mathbf{p}_t &= (1 + g)^t \mathbf{p}_0 = (1 + g)(1 + \pi)(1 + u)\mathbf{A}(1 + g)^{t-1} \mathbf{p}_0 + (1 + g)^t w_0 \mathbf{l}, \\ \mathbf{p}_0 &= (1 + \pi)(1 + u)\mathbf{A}\mathbf{p}_0 + w_0 \mathbf{l}. \end{aligned}$$

In terms of commanded labour, we again get

$$\frac{\mathbf{p}_0}{w_0} = (1 + \pi)(1 + u)\mathbf{A}\left(\frac{\mathbf{p}_0}{w_0}\right) + \mathbf{l} = (1 + r)\mathbf{A}\left(\frac{\mathbf{p}_0}{w_0}\right) + \mathbf{l}.$$

The price change caused by the change in the interest rate di and added to the inflationary trend expressed as g is therefore

$$\frac{ds}{s} = \frac{dr}{R-r} = \frac{1+u}{1+g} \frac{di}{R-r}.$$

Given a galloping inflation rate of $g = 30$ per cent, and $u = 10$ per cent, with a nominal rate of interest of $i = 15$ per cent, we get in approximation $\pi \approx i - g = -15\%$, $r \approx -5$ per cent. For a rise in the nominal rate of interest of 5 per cent, we get

$$\frac{ds}{s} = \frac{1+u}{1+g} \frac{di}{R-r} \approx \frac{\left(\frac{11}{10}\right)}{\left(\frac{13}{10}\right)} \frac{\left(\frac{1}{20}\right)}{\left(\frac{1}{3}\right) + \left(\frac{1}{20}\right)} \approx 11\%.$$

The multiplier is lowered by inflation, but a rise in the interest rate of 5 per cent by the central bank still results in a price rise of more than twice of that, causing a redistribution from wages to profits or to income from interest. The dampening effect on economic activity must be all the more pronounced if it is to break the wage-price spiral. If the nominal rate of interest is not soon lowered when the rate of inflation sinks, there will be a substantial rise in the real rate of interest, leading to wage demands. A quick transition from high rates of inflation to a new equilibrium is therefore not easy to achieve. All the more important it is, then, to begin the fight against inflation at an early stage and to nip it in the bud with the credible threat of counter-measures.

We cannot take all of the effects of changes in the interest rate and in distribution into consideration. In particular, we may expect that long-term changes in distribution are associated with changes in demand and attitudes to saving. In a different place, I have presented a way of analysing at least possible changes in distribution, sketched here within a Classical framework, also within the context of intertemporal general equilibrium theory.¹⁰ We cannot go into further detail here, and with regard to technical changes, we can do no more than indicate in general that, first of all, labour productivity will increase over time, and to that extent, the price rise induced by the rate of interest will be offset. As far as the development of the demand for money in connection with assumed changes in distribution is concerned, different scenarios can be sketched. Tooke, in modern parlance, would most likely have invoked his theory of endogenous money, but we may also point to the fact that at least in the short term, economic activity will decrease when interest rates go up, and hence additional accommodative monetary policies may not be needed. In any case, a change in the rate of interest with long-term effects is a complex measure, and in the present context we can look at its development and results only in an extremely simplified and stylised fashion.

Maybe the reader will begin to worry at this point whether all of this is meant to bear out the view of those who heretically recommend the lowering of interest

rates in the case of inflation. But there are counter-arguments, even within the limits of the analytical framework set by us. Interest rate rises may be necessary for exerting a dampening influence, usually accompanied by lower economic activity, not only on monetary wages but also on corporate profits. *If* the fight against inflation leads to declining employment rates, the blame should not primarily be placed on the central bank, but rather on all of those who have set the inflationary process in motion. However, from the assumptions made so far, it follows that long-term interest rate rises may lead to price rises that are more pronounced than economists would consider possible.¹¹

A qualitative change, however, sets in once we expand our considerations beyond the prices of circulating capital. The introduction of consumer goods or, more generally and expressed in Sraffa's terminology, of non-basic commodities, does not essentially change anything because their prices depend one-sidedly on those of the basic commodities. Fixed capital can be taken into account using the joint production approach. If we consider machines as joint products, the output matrix, which so far was a unit matrix, must be replaced with a square joint production matrix **B**. However, there still is a standard commodity and a linear wage curve associated with it (Schefold 1997e, ch. 9), so that we can put

$$(1+r) \mathbf{A} \begin{pmatrix} \mathbf{p} \\ \mathbf{w} \end{pmatrix} + \mathbf{l} = \mathbf{B} \begin{pmatrix} \mathbf{p} \\ \mathbf{w} \end{pmatrix},$$

where, in standard prices,

$$w = 1 - \left(\frac{r}{R} \right).$$

In the case of fixed capital, it is no longer generally valid that prices expressed in terms of commanded labour are always monotonously rising with the rate of profit. In the case of old machinery that is less efficient, compared to the corresponding new machines, they may fall. Nevertheless, if the calculation is done in standard prices, the formulas used so far remain valid, though the process of adaptation of market prices to the prices over the long period may be slower, as the cost of machines in the short period is not calculated on the basis of the cost of their reproduction but follows from the discounting of the expected future returns. In the (long-term) equilibrium, however, the value of machinery and its reproduction cost, as calculated on the basis of discounted future returns, are identical. As I have demonstrated as early as 1971 (Schefold 1971), this is a consequence of the joint production approach.

A genuine qualitative change therefore only follows from the introduction of land as a factor (ignoring securities for now). We assume that the rent for land can be calculated according to the Classical Theory of differential rent, in which the rent of individual pieces of land changes, like the prices, in line with the income distribution. However, there is no clear tendency for the aggregate of rents, and thus for the sake of simplicity we assume that the income flow of

aggregated rent, α , is a multiple of the flow of the standard product. Thus, if ϱ stands for the aggregate rent per period, then

$$\varrho = \alpha \mathbf{q}(\mathbf{B} - \mathbf{A})\mathbf{p} = \alpha,$$

where α shall remain constant and \mathbf{B} stands for the output matrix of basic systems taking fixed capital into account.

If we consider the amount of non-basic commodities produced (especially pure consumer goods which do not form an input into production) as standing in a proportional relation to the net standard product with a factor of β (though this cannot exactly be the case), and if we take the rent for land into account with the already introduced factor α (the input-output aggregate of processes involving the use of land, setting aside the land itself, may well be proportional to the net standard product – see the following), we obtain a modified basket of commodities for the calculation of the index \hat{s} with prices expressed in terms of commanded labour:

$$\hat{s} = (1 + \alpha + \beta)(\mathbf{B} - \mathbf{A})\left(\frac{\mathbf{P}}{w}\right).$$

As we are interested in the relative price changes, and as

$$\frac{\hat{ds}}{\hat{s}} = \frac{d\hat{s}}{dr} \frac{dr}{\hat{s}} = \frac{(1 + \alpha + \beta)R}{(R - r)^2} \frac{(R - r)dr}{(1 + \alpha + \beta)R} = \frac{dr}{R - r},$$

our basic formula for the relation between changes in the real rate of profit, on one hand, and prices relative to monetary wages, on the other, is not affected by taking fixed capital, consumer goods, and rents into account.

The step of taking rent-yielding assets, such as land, into account by including the rent in the price index corresponds to the usual conventions for the formation of price indices. One may, however, also ask the question as to what effects distributive changes have on the price of land. We can obtain the prices for land from the capitalisation of rent. Thus, in aggregate they are ϱ / i . Assuming again that the rate of interest and the rate of profit coincide, we may form a new price index z

$$z = \left(1 + \beta + \frac{\alpha}{r}\right) \mathbf{q}(\mathbf{B} - \mathbf{A})\left(\frac{\mathbf{P}}{w}\right).$$

In what follows, we assume the proportion of non-basic commodities to be $\beta = 0$. The standard system now consists of the basic processes from which land has been eliminated but is yet taken into account through our coefficient α .¹² Introducing a norm for our standard commodity, which now includes machinery, by setting $\mathbf{q}(\mathbf{B} - \mathbf{A})\mathbf{p}$ to 1, we get

$$z = \left(1 + \frac{\alpha}{r}\right) \frac{R}{R - r}.$$

At this point, we come across a problem that is well known in the history of economic theory: in a stationary state, with interest rates approximating zero, the price of land tends towards infinity. The new price index, which in principle includes all consumer goods, and all types of capital and land, is characterised by the fact that in the case of low rates of interest, a rise in interest rates leads to a drop in the overall index, because the effect of the falling prices for land dominates over that of the rising prices for consumer and capital goods. This overall index, however, will also move towards infinity if the rate of profit approaches its maximum. At the minimum of the index, we have $dz/dr = 0$. Such a minimum is also given when α has a low value, because profits and income from wages far exceed the rent (in the sense of rent from land), as is the case in modern industrial societies.

Let us take a quick look at the position and shape of the curve. If we differentiate the equation for z and set z to zero, we get a quadratic equation for the minimum $r^2 + 2\alpha r - \alpha R = 0$. Hence, the minimum is given by

$$r^* = -\alpha + \sqrt{\alpha^2 + R\alpha} = \alpha \left[\sqrt{1 + \left(\frac{R}{\alpha}\right)} - 1 \right]$$

(a negative root can be ruled out for economic reasons). We can see at once that r^* must be positive (if R and α are positive).

Obviously, the proportion of rent is essential for our considerations. Thus, we take r^* as a function of it – hence: $r^* = r^*(\alpha)$. We see that $r^*(0) = 0$, and differentiation shows that the gradient of $r^*(\alpha)$ is positive and, with $\alpha \rightarrow 0$, diverges towards infinity. For large values of α , by contrast, $\frac{R}{\alpha}$ takes on a small value. Thus, a first approximation gives us

$$r^*(\alpha) = \alpha \left[\sqrt{1 + \left(\frac{R}{\alpha}\right)} - 1 \right] \approx \alpha \left[1 + \left(\frac{1}{2}\right)\left(\frac{R}{\alpha}\right) - 1 \right] = \frac{R}{2}.$$

From this, we may conclude that $z(r)$ is a U-shaped function which diverges towards infinity for $r = 0$ and $r = R$, and which has a positive minimum point where for r^* : we have $0 < r^* < \frac{R}{2}$. The larger the proportion of rent, the more symmetrical the shape of the U will be, and the closer the minimum moves to $\frac{R}{2}$. If the proportion of rent tends towards zero, the minimum shifts to the left towards the origin, and to that extent $z(r)$ tends towards $s(r)$.

Which value does the price index reach at the minimum point? Given our approximation $r^* = \frac{R}{2}$, with $\alpha = 1$, and $R = \frac{1}{3}$, we get

$$z(r^*) = \left(1 + \frac{\alpha}{r^*}\right) \frac{R}{R - r^*} = \left(1 + \frac{2}{\frac{1}{3}}\right) \frac{1}{1 - \left(\frac{1}{2}\right)} = 14$$

In the semi-agricultural world symbolised by these figures, in which income from rent equals industrial income, the minimum price level is not, as may be expected, twice that of the industrial prices, but rather, as a consequence of the redistribution which finds expression in the prices, the level of industrial prices doubles already when $r = \frac{R}{2}$. Through the capitalisation of rent, there is a further seven-fold increase in the index composed of the prices for industrial goods and the price for land!

The proximity of r^* thus signifies an area in which the central bank behaves in neutral fashion regarding its price policies, as the prices for goods rise with the rate of interest and profits, while the price of land falls, with the two effects just cancelling each other out. Very low interest rates are economically impossible, because the price of land would have to rise immeasurably, and no one would be able to buy this land, unless there was an unlimited increase in the quantity of money. The scarcity of money should keep at least the nominal rate of interest above zero. For similar reasons, affecting the prices of goods near R , interest rates have an upper limit. Keynes, in particular, emphasised that the level of long-term interest rates is subject to certain conventions. According to the analysis presented here, conventional interest rates must necessarily lie within a broader range of central bank policies.¹³

In modern national economies, the income that can be generated from land rents plays only a subordinate role; but there are assets with fixed interest rates whose value, as in the case of land, is determined by discounting on the basis of the interest rate (their rise in value, however, does not tend toward infinity if the interest rate sinks, unless they have infinite maturity). The determination of share prices is more complicated, as their value also depends on the amount of distributed profit.

The result is, in any case, that in the long term the central bank does not cause the average of prices to rise with moderate increases of moderate interest rates but rather lowers it, because of the necessary preponderance of discounted rents. Nevertheless, Tooke's reference to prices of goods rising with interest rates (and to the fact that under extreme conditions, they must even rise very strongly) should be taken seriously, because when looking at processes of inflation, the price of goods will always be seen as crucial, and in the case of long-term analyses these will, in fact, necessarily follow the trends postulated by Tooke. If the price index is meant to capture the purchasing power of consumers, it is correct to take rents, instead of the price of land, into account, i.e. to set out from a \hat{s} , rather than z . If, by contrast, one is thinking of investors, then the prices of rent-yielding assets become relevant. Therefore, in some countries, the interest itself has been incorporated into the price index, although this bears the danger of overestimating the threats of inflation towards the end of an inflationary period when the rates of interest begin to pick up again.

The increase in the price of goods associated with long-term rises in the interest rate can be compensated for by other effects. Thus, I consider it possible that the increases in interest rates of the 1980s did indeed have the long-term effect of

causing a rise in the rate of profit. But because they were at the same time accompanied by a dampening of the upward trend in wages, there was only a limited rise in prices.

Despite its assiduous followers, Tooke's book did not have the same school-forming influence that Marshall's *Principles* exerted. It is also not written with the same clarity that characterises Ricardo's writing, even in his pamphlets. But *An Inquiry into the Currency Principle* gained historical significance through the role it played in one of the most important theoretical debates in the history of economics, and the questions it raises are still far from being answered definitively. In particular, it would be a great achievement of economic policy if a way was found of reducing the cost of fighting inflation.

Walter Bagehot: political economist and publicist in the Victorian era

When Walter Bagehot's *Lombard Street: A Description of the Money Market* appeared in 1873, the great transformations at the middle of the century had been completed, and a period of economic consolidation and prosperity began in Western Europe and America which would last for a solid forty years until the Great War. Long after England and France had formed into national states, the efforts at unification in Italy and Germany were finally successful. The Civil War in America had not ended in the secession of the Southern states. Great progress was made in communication technology, and a network of railways stretched across the old continent and connected the Atlantic and Pacific coasts in America. The Suez Canal, which had been a French initiative, predominantly served English interests and, to a lesser extent, those of the Levante, of Italy and France, contrary to the expectations of many. Telegraph lines connected not only continental cities, but recently also the two sides of the ocean. Those living at the time felt how ever-closer ties developed within a world market, just as today we are struck by the phenomenon of 'globalisation'. In 1873, a crisis emerged which led to a long-term depression with falling prices. But this had been preceded by a massive upturn, especially in the young German Reich, and on the basis of political and infra-structural conditions that had recently been created, the economy continued to grow until the end of the nineteenth and the beginning of the twentieth century, justifying the talk about the golden age of liberal capitalism.

It was also 'golden' in the literal sense. At least when looked at in retrospect after 1918, it was the great time of the gold standard, which formed a solid basis for the international circulation of commodities and capital. As a system, it proved flexible enough to withstand large transfers, such as the French reparations to Germany after German victory in 1871, and the gold that was found in South Africa and later Alaska made it easier to expand it.

Today, we usually do not think of the gold standard as a system in which all circulation of commodities was mediated by payment in gold, because the metal, which was expensive to extract, was substituted with notes, bills of exchange, cheques, and other credit instruments. And we are also convinced that the credit

system did not follow automatic regulations but rather was based on peculiar economic conventions and political institutions. Every country kept reserves, in order to be able to defend its parity, with the English pound functioning as the key currency because of London's outstanding importance as a financial centre, but also because the institutions responsible for England's currency policies enjoyed exceptional prestige. 'British monetary orthodoxy', it appears to us, represented the world's monetary form, and thus one is led to assume that for decades or even centuries, this 'orthodoxy' in monetary matters was solidly established, first and foremost, in London. Whoever heard that the Bank of England had been founded in 1694 may well believe that it had played the lead role within the world's currency system for several centuries, as the country's central bank, which housed the main financial centre for world trade.

However, the Bank had been established upon parliamentary resolution in 1694 as an instrument for financing the military. It was privately owned, though it entertained special relations with the government, in particular regarding the administration of state debts. And until the first quarter of the nineteenth century, it enjoyed the privilege of being the only joint stock bank.¹⁴ Authors of the eighteenth and early nineteenth centuries, such as Henry Thornton, already recognised that the Bank of England performed functions which today we would see as characteristic of central banks. However, the promotion of free trade around the middle of the nineteenth century questioned the special role of the state's monopoly in banking, and as a consequence, in mid-century and after, even the directors of the Bank of England displayed a surprising degree of uncertainty over the bank's role and tasks when asked about them by parliamentary commissions in times of economic crises.

It is Walter Bagehot's historical merit to have provided a new orientation toward these questions in the form of articles in the journal *The Economist*, of which he was the editor, in speeches and discussions, but most of all in his book. From a narrow perspective, he defined the role of the Bank of England as the keeper of the country's monetary (and, internationally, of the gold) reserves. When necessary, these were to be used nationally in situations of tight credit or internationally in order to defend the exchange rate. From a wider perspective, Bagehot can be seen as the genuine founder of 'monetary orthodoxy'. His brilliantly written book did not just satisfy the curiosity of those who had always wanted to know how the London money and capital market actually works, a market whose volume by far exceeded that of other financial places. It also helped to bring about a sense of responsibility, both inside and outside of the Bank, thus making it possible to counter more determinedly and more effectively the moods of panic, which, around the middle of the century, had recurred about every ten years in the monetary and capital markets.

Lombard Street is a slim volume of significantly less theoretical depth than other major works of political economy from the same period, and its merits are of a fundamentally different nature from those of a work such as Walras's *Éléments*. What explains the success and historical importance of the book is the necessity at the time of persuading the Bank of England to acknowledge a responsibility

which on the continent was a legal requirement – for example, for the Banque de France. In any case, subsequent to the book's publication, it was noticeable that the directors of the Bank of England internalised their tasks as defined by Bagehot with increasing clarity, although little changed regarding their external status, as the Bank was only nationalised in 1946.

The reader will therefore watch out with particular interest for the means by which Bagehot tries to convince his opponents, i.e. those holding the prevailing views of the city. At the end of his career, George Warde Norman, who was director of the Bank of England for fifty-one years (1821–72), still wished for the Bank of England to be more like other banks, or, rather, he wished that the other banks would hold greater financial reserves than the day-to-day operations required, in line with the Bank of England. The idea was that this would lead to the development of competition between banks on an equal footing, with all banks confronting the risks of crises. The Bank of England on its own, he thought, would not be able to hold sufficient reserves for this. Behind these reservations stood, among other reasons, the interests of the shareholders of the Bank of England who called for higher dividends and repeatedly demanded the use of at least a part of the existing reserves for profitable lending.¹⁵

When reading the book, a reader today who takes the modern two-tier banking system for granted will be particularly surprised to learn that Bagehot himself was inclined towards the doctrine of 'free banking' and followed the vision of a 'natural' banking system, in which every bank holds reserves. As no other system apart from the gold standard is mentioned, this would require every bank to hold more gold in its vaults than is necessary for the daily transactions and to be prepared to carry the opportunity costs. What kept Bagehot from calling for the realisation of this vision (which was, after all, close to the heart of George Warde Norman) were not considerations regarding the possible instability and the inherent tendencies towards concentration that characterise such a system. Rather, it was the recognition that a long historical development had created a different set of facts – namely, the overwhelming importance of the Bank of England, which was reflected in the volume of its share capital and thus the vast extent of its operation, along with the ineradicable habit of all other banks and discount banks to use the Bank of England for refinancing, especially in financially tight times.

At least one contemporary considered this system not only to be subject to unavoidable fluctuations that were to be accepted as the price to be paid for economic progress, but also to be doomed to fail altogether. That contemporary was Karl Marx, who wrote,

So long as enlightened economy treats 'of capital' *ex professo*, it looks down upon gold and silver with the greatest disdain, considering them as the most indifferent and useless form of capital. But as soon as it treats of the banking system, everything is reversed, and gold and silver become capital *par excellence*, for whose preservation every other form of capital and labour is to be sacrificed. . . . It is faith in the social character of production which allows the money-form of products to assume the aspect of something that is only

evanescent and ideal, something merely imaginative. But as soon as credit is shaken—and this phase of necessity always appears in the modern industrial cycle—all the real wealth is to be actually and suddenly transformed into money, into gold and silver—a mad demand, which, however, grows necessarily out of the system itself. And all the gold and silver which is supposed to satisfy these enormous demands amounts to but a few millions in the vaults of the Bank [of England; B. S.] . . . In the crisis, the demand is made that all bills of exchange, securities and commodities shall be simultaneously convertible into bank money, and all this bank money, in turn, into gold.’

(Marx 1959, p. 573f.)

While Marx thinks that he has convicted the ‘capitalist mode of production’ of an obvious ‘absurdity’, Bagehot tries to show that money and credit crises can effectively be countered within the national framework by raising the rate of discount at the psychologically right moment and by generously lending on all safe securities. Raising the rate of discount at the same time prevents the efflux of gold. It is nothing short of admirable what Bagehot has to say about the formation of expectations in this context. However, he has less to say about the costs to the real economy caused by raising interest rates. This is the point from which Keynes’s critique would later depart, which ends by wanting to discard monetary orthodoxy altogether. The following passage from his *General Theory* illustrates his late turn:

Under the influence of this faulty theory the City of London gradually devised the most dangerous technique for the maintenance of equilibrium which can possibly be imagined, namely the technique of bank rate coupled with a rigid parity of the foreign exchanges. For this meant that the objective of maintaining a domestic rate of interest consistent with full employment, was wholly ruled out. Since, in practice, it is impossible to neglect the balance of payments, a means of controlling it was evolved which, instead of protecting the domestic rate of interest, sacrificed it to the operation of blind forces.

(Keynes 1967, p. 339)

At times, depreciation can indeed provide the necessary temporal leeway for an adjustment of external trade with less loss of employment than would follow from applying interest rate policies only. Wage restraint is the precondition for this, if inflationary pressures from rising import prices are to be countered.

Bagehot does not put the gold standard in question. The merits of his book do not lie in the theoretical analysis of different conceivable institutional arrangements. Rather, the merits consist in the closer examination of the inner logic and the political, as well as the economic, logic of the existing system. Although he provides impulses for theory, this book is a classic not of economic theory but of economic policy-making and of our understanding of banking altogether. The suggestion to include it in the series *Klassiker der Nationalökonomie* was made by Wolfram Engels, who sadly died far too early but was still able to establish

first contacts with commentators. If I remember our conversations about the book correctly, Wolfram Engels was, on one hand, attracted by the vision of ‘free banking’ in Bagehot, an aspect which brought him close to the ideas on banking policies held by another earlier editor of our series, F. A. Hayek. On the other hand, he admired the way in which Bagehot tried to give the role of the Bank of England as a central bank a clear definition in terms of regulatory policies, despite the fact that he did not suggest to take the path of legislature for this but only interpreted the historically grown facts – just as the English constitution has remained unwritten and yet is able to determine the political life of England.

Early on in his life, Walter Bagehot (1826–77) acquired fame as a brilliant *Homme de lettres*, a well-versed journalist, a sought-after advisor of English ministers, a skilful banker, and an expert on the sciences. His mother, Edith Stuckey, came from a family of merchants; his father was managing director and vice-chairman of Stuckey’s Banking Company. Having graduated from University College London with excellent results, he decided to join the family’s banking business. In 1857, he became acquainted with James Wilson, the founder and editor of the weekly journal *The Economist*, whose daughter Eliza he married a year later. In 1859, he became a director and in 1861 the editor of the journal. However, he also continued to be active within the Bank and played a role as political advisor. The latter is said to have given him even more influence than a minister, although he did not become a member of Parliament.¹⁶

Bagehot was much appreciated as a political and literary author, but Keynes was decidedly of the opinion that he was at his best when writing as an economist:

If Mrs. Russell Barrington [the editor of *The Works of Bagehot*, published in 1915, B. S.] could have altogether concealed the fact that Bagehot was the author of *Lombard Street*, she probably would have done so. Yet it is quite certain that the chapter on the position of the Governor of the Bank of England is immeasurably better in its kind than the studies of Shakespeare and Milton are in their kind. How is it that Bagehot was an economist and yet not an economist?

(Keynes 1915, p. 369)

Keynes’s own solution to this riddle was to interpret Bagehot’s achievements, first and foremost, as those of a psychologist and multi-faceted author of especially good taste who was capable of elegant formulations. The best parts, he said, were the descriptions of politicians and businessmen of his times, based on Bagehot’s own observations. In other words, Keynes praised precisely those of Bagehot’s characteristics that only a few years later he himself would display in such exceptional fashion in his *The Economic Consequences of the Peace*, the book which first brought him worldwide fame and made him especially popular in Germany. Apart from that, Keynes considered *Lombard Street*, despite the fluent style in which it is written, to be a fairly difficult book that deals with complicated and abstract matters. But: ‘... it is not necessary to understand it much in order to enjoy it a good deal’ (Keynes 1915, p. 371). In one respect, Keynes qualified his praise very

clearly: already in 1915, Keynes found Bagehot's analysis of the economic cycle unsatisfactory.

Bagehot praised in Adam Smith those traits which he possessed himself, even if not to the same degree: 'he impressed practical men by his learning, at the same time that he won them by his lucidity and assured them by his confidence' (Bagehot, quoted in Keynes 1915, p. 373).

His admiration of Ricardo was more distant, using words which, after the events of the twentieth century, sound somewhat strange to us:

The writings of Ricardo are unique in literature, so far as I know, as a representative on paper of the special faculties by which the Jews have grown rich for ages. The works of Spinoza, and many others, have shown the power of the race in dealing with other kinds of abstractions; but I know none but Ricardo's which can awaken a book-student to a sense of Jewish genius for the mathematics of money dealing. His mastery over the abstractions of Political Economy is of a kind almost exactly identical.

(Ibid., p. 373)

Bagehot's talents as an analytic economist turned out to be fairly limited. His book, rather, proves how much may also be achieved through psychological, historical, and political comprehension, as well as through the exercise of the faculty of judgement.

Lombard Street is difficult to understand without the context of the eventful history of the Bank of England. From a modern perspective, there is the temptation to project today's two-tiered banking system onto the past. But even during the Napoleonic Wars, when the gold standard was suspended, the structure of banking was more complicated than that. London's private banks mostly held their reserves in notes at the Bank of England, while the local banks of England made less use of the Bank of England and mainly kept their reserves as deposits in the form of treasury bills and bills of exchange at London's private banks. They were allowed to issue their own notes. The situation was different again in Scotland and Ireland. With the return to the gold standard in 1819 and the approval of further joint stock banks from 1826, the special status of the Bank of England further decreased. Peel's Bank Charter Act of 1844 divided it into an issuing department and a banking department. The former was tasked with the issuing of notes, the amount of which was limited by the available gold backing. In the wake of this development, activities for the promotion of 'free banking' intensified, and it was often thought that the banking department should act like any other bank. The function of a central bank, to the extent that it existed at all, seemed to disappear. In any case, the core question remained pending: namely, whether the Bank of England should act out of professional allegiance to the state and, if necessary, against the interest of its shareholders, or whether the latter had priority. When in doubt, the Bank reacted hesitantly to credit crises, and Peel's Bank Charter Act also prevented it from issuing more notes to satisfy the increased demand for money in times of panic. Thus, several times the Act had to be suspended by the government in order to allow the situation to calm down.

A question put to Parliament's Select Committee on Commercial Distress in 1848 pointed out the contradictory expectations raised by the Bank of England:

I am speaking with reference to the ambiguous position of the Bank of England, it being connected in some way or other with the Government, it frequently appears to me to act as a private individual would act, and then at other times it appears to act as having certain national objects to sustain or difficulties to meet; so that a country tradesman, like myself, has no idea what the policy of the Bank is.

(Fetter 1965, pp. 262–3)

While John Stuart Mill advocated that generous and decisive action was to be taken by the Bank in times of economic strain, opposing voices at a hearing in 1858 sounded like this one:

As I said before, the Bank of England will have great difficulty in getting rid of that inconvenient idea which there is in the mind of the public, that the Bank of England is something more than an ordinary joint-stock bank.

(Ibid, p. 265)

In the same year, the editor of the *Times* worked himself up into making the following sarcastic comments:

The notification that the Bank have put their rate up or down – and the authority it seems to bestow, that every other moneyed institution in the country may act accordingly – has no more inherent value than the proclamation to all the monarchs of the earth that they take their supper after the Emperor of China, but it unquestionably exercises a great influence on certain imaginations.

(Ibid, p. 266)

There was also no agreement on the appropriate form that interventions should take. Should the Bank, as Bagehot suggested, lend money on all securities of a certain quality once a particular, potentially high, rate of interest was reached, or should it intervene at a lower rate of interest but at the same time limit the supply of additional credit? How should the volume of the Bank's necessary reserve be measured? Bagehot widened this discussion by emphasising that the Bank of England was *obliged* actually to use its reserve, even though there was no legal requirement to do so – it was purely a thought that suggested itself for no other but rational reasons based on the situation that had historically arisen. In an article of 1861 in the *Economist*, he had the following to say to the Bank's shareholders: 'The ultimate interests of the proprietors of the Bank, we believe, will be best advanced by the most complete discharge of the bank's duty to the nation' (ibid., p. 271).

Indeed, it seems that the stockholders of the Bank of England at their meetings were fobbed off with platitudes; they were simply told that it was not common practice to provide details about how business was conducted, or about the motives driving decisions.

The relationship between the Bank of England and the government remained in abeyance even after Bagehot. The Bank of England had been created as a monopoly institution supported by the state, and under the influence of an oligarchic government. The free trade and democratic movements asked the questions which today would be called questions of regulatory policy. The answer given was Peel's Bank Charter Act, i.e. an attempt at implementing an automatic mechanism, and it failed at times of crises. Each time, its suspension was decided by the government, after having been informed of the relevant facts by the Bank of England, but the Bank itself attached importance to the fact that it had not exerted any pressure on the government to take such a decision. That role was left to the other banks. In 1873, a discussion unfolded once again over the question as to whether the authority to exceed the limit on the emission of notes set by Peel's Act should not be put in the hands of the Bank of England. But the development of deposit banks made this question less important, and until the Great War no further suspensions of the Act occurred. 'Monetary orthodoxy' had been victorious, and the Bank of England saw itself as a central bank. However, the degree of authority which the government exercised over it was never fully determined.

Bagehot's book begins with a vivid exposition of the importance of London's financial market for England's economic supremacy in world trade at the time of his writing. How should the railways have been financed without the concentration of capital in this market? However, for Bagehot its real significance lies in the rising tendency of industrial enterprises to turn to it for financing their undertakings. The progress, though, comes at the price of a levelling out of the aristocratic form of life, which long ago continued to characterise the Italian city-states, despite their far-reaching trade relations.

Bagehot considers the acceleration of economic processes to be the transformative moment. Because of it, attempts at the rational anticipation of future developments appear powerless, as they are confronted with unpredictable realities. London's financial market reacts quickly and sensitively to unexpected events, and, as such, it is particularly exposed to speculative movements. The moments of panic, Bagehot points out, are again and again forgotten, though he does not want to appear 'alarmist'.

In 1848, the expansion of the credit system impressed Hildebrand in Germany so much that he saw in it the dawn of a new stage in economic development. Credit means trust and therefore exerts an educational influence. Thus, Hildebrand hoped that progress in the monetary sphere would also bring with it moral progress.¹⁷ The young Marx took an opposing view and accused the credit system of intensifying alienation, inequality, and, as it extended the possibilities of fraud, immorality.¹⁸ Bagehot illuminates the logical aspect of these processes, especially the need to build trust, but refrains from making moral judgements. The Bank Charter Act of 1844 made the notes of the Bank of England (in addition to precious metal coins) legal tender, but the restrictions on the emission of notes and the limited volume of reserves led to repeated suspensions of the Act in the years 1847, 1857, and 1866. However, the law did not create the danger – the Bank of England had been close to bankruptcy even earlier in 1825.

The reserves in precious metal, Bagehot said, had to be sufficient not only for England, but also for some other European countries which held deposits at the Bank of England, such as the German Reich. The Bank therefore paid lower dividends compared to others, and its share value had gone up less. Bagehot has doubts over the motivation of the members of the Bank's directorate; nevertheless, he observes that the public has the most solid trust in the Bank, despite all deficiencies.

Bagehot's descriptions of the way in which the Bank uses economic instruments, in particular that of raising interest rates in order to promote the influx of gold, and export surpluses, are short and to the point. He criticises the Bank for having acted clumsily in various crises that had occurred before 1857, and he indulges in a very lively description of a panic. The role of a 'Lender of Last Resort' can hardly be presented more dramatically. The most important point is to smother any doubts regarding the Bank's commitment to its true task, but during times of panic, the directors had repeatedly made the mistake of hoping that their clientele would help themselves. Essentially, the only addition Bagehot makes to the demand that the Bank should be unreservedly committed to its obligations is the suggestion to provide it with better-educated leading employees.

These are the fundamental ideas of the book. The third chapter contains historical details on banking in England and Europe, together with Bagehot's interesting judgements on them. The fourth chapter deals with the relationship of the Bank to the state. Only with Peel's Bank Charter Act did the government join in the responsibility of running the Bank, as, according to Bagehot, demonstrated in the times of panics. The fifth chapter is technically more difficult. It discusses the limits of the Bank's power to set the interest rate, which, following an old tradition, he calls the 'price of money'. We may think of Wicksell's process: an untimely lowering of the interest rate leads to a stimulation of demand and to rising prices, which sooner or later bring about a return of the interest to its 'natural' level. However, it lies in the nature of things that the fluctuations of the interest rate are higher than those of the market prices for commodities, and thus Bagehot approaches his sixth chapter, which describes the economic vicissitudes to which Lombard Street is subjected. Long periods of calm alternate with acute situations of strain, such as have been known at least since the 'mania' of 1688 and the 'South Sea Bubble'. Speculative expansions are always the consequence of interest rate cuts, whose multiplying and accelerating effects Bagehot describes. These are not just the result of the Bank's behaviour, but may also result from changes in the money-holding habits of the public and of foreign clientele. Here, the most recent contemporary examples Bagehot gives are the changes in the German Reich's gold deposits held in London, during and after the Franco-Prussian War.

Any increase in savings without a corresponding willingness to invest can have inflationary consequences:

As a principle it may be laid down that all new unemployed savings require *either an increased stock of the precious metals, or an increase in the efficiency of the banking expedients by which these metals are economised.*

(Bagehot 1875, p. 143; emphasis in the original)

According to Bagehot, such an increase of the ‘. . . effective quantity of gold in the country’ (ibid., p. 143) will drive prices up and stimulate demand. From the textbook point of view, this formulation appears paradoxical, but Bagehot thinks that interest rates will fall, on account of the increase in savings, which then has an effect on demand. He does not ignore the preceding dampening of demand due to hoarding but interprets it as temporary: ‘During a depressed period the savings of the country increase considerably faster than the outlet for them’ (ibid., pp. 142–3).

Periodic overheating, it seems, appeared unavoidable to him. It was probably passages like this one that Keynes in 1915 felt were ‘difficult’.

The Bank’s dampening effect on the economy is of crucial importance, the seventh chapter states, but the Bank did not clearly formulate its obligations in this respect, nor did Parliament brief it accordingly. High figures of authority, even within the Bank itself, rejected such a brief. And when subsequently confronted with the need to defend themselves, the Bank’s directors would declare, within the twinkling of an eye: ‘We did not flinch from our post . . . before the Chancellor of Exchequer was perhaps out of his bed we had advanced one-half of our reserves’ (ibid., p. 165).

Bagehot therefore feels that he needs to address more closely the psychology of the Bank’s directors, who are exposed to such contradictory demands and at times make such confused utterances. Using his vast knowledge of detail, he once again covers the history of the Bank, this time from the perspective of administrative efficiency. This historical knowledge provides the background for chapter 8, which describes the administrative practice at the time and suggests simple reforms.

This is followed by three chapters on joint-stock banks, private banks, and discount banks. In these chapters, we can see how well he anticipated the developmental possibilities of these different credit institutions. In the twelfth and in the final chapters, Bagehot explains his views on how the Bank may exert an expedient influence on public expectations. The levels of the Bank’s reserves are published – at what point can they be considered appropriate? This is impossible to tell: ‘The forces of the enemy being variable, those of the defence cannot always be the same’ (ibid., p. 318).

Bagehot speaks of an ‘apprehension point’, at which Lombard Street slowly begins to be worried in the face of low reserves. At that point, it is important to act in a psychologically appropriate way. The principle which always applies is that ‘. . . too much reserve only means a small loss of profit, but too small a reserve may mean “ruin”’ (ibid., p. 323).

In conclusion, Bagehot says that he has diagnosed a profound illness but that he expects to be accused of having recommended only a superficial remedy. A natural banking system, he holds, must rest on decentralised reserves, but such a vision could not be realised. In other words, Bagehot describes the emergence of a ‘benevolent monopoly’ from a liberal perspective, and he shows the path towards its stabilisation.

The voices in favour of a free banking system have not fallen silent even today. But it will hardly be possible to claim that we have come any closer to a practical

implementation of Bagehot's vision or that confidence in it has risen. In the end, the reader is forced to return to the initial questions, which are hardly susceptible to an answer: Would another development have been politically possible? Would it have turned out to be economically stable? If these questions cannot be answered with a clear no, why did the Bank of England, the government, and the well-informed public in the end internalise 'Bagehot's Principle', while at the same time repressing his vision? It speaks in favour of Bagehot's book that the reader, having finished the book, feels compelled to go straight back to its beginning, in order to get closer to the riddle's solution in the course of a second reading.

Rudolf Hilferding and the idea of an organised capitalism

Rudolf Hilferding's *Finance Capital* has often been associated with Marx and dubbed the 'fourth volume of *Capital*', an honorary title indicative of the work's status. There is hardly any other text in Marxist economic literature that could be compared to it. It tries to take up the questions that Marx had asked, while retaining the high level of his analysis, employing his method and often even his style, and it is frequently surprisingly successful in this. At the same time, Marx's train of thought is continued with such originality that the reader never gets the impression of epigonic parroting, which often makes the reading of texts from the former German Democratic Republic almost unbearable. Even though Hilferding did not equal Marx's genius, and his understanding of Marx's theory seems limited in some respects, he nevertheless possessed an advantage at the human-political level. And in order to clarify the nature of this advantage, we begin with a discussion of the founding figure.

We feel that historical thought experiments are childish pastimes and we should not engage in them, but actually they can teach us some things. Mark Blaug, perhaps the best-known European historian of economic dogma, assures us that it would have been better for the world if Marx had never lived, despite his theoretical achievements. Let us modify this thought experiment and ask how the world might have developed and how Marx would appear to us today if he had given his ideas about economic development a democratic framework, and if he had given priority to the establishment of, and adherence to, principles of the democratic rule of law in his political theory and practice. In other words, let us imagine a Marx who would have talked about revolution to his International Workers Association only to the extent that it appeared necessary in order to help the formal political rights of the people to prevail, who would have wanted to realise his economic ideas only to the extent that they found approval in freely elected parliaments and in referenda, and who would have risked his moral authority in trying to persuade his adherents that this is the right attitude to take. Legal principles would have been put above a blind materialist law of development, and at least someone like Lenin would not have been able to use Marx's ideas for justification.

In certain situations, the historical Marx corresponded to this ideal. To bourgeois families, he appeared not only to be an exceptionally witty and universally

educated conversant and excellent story-teller, but also noble and just. And he was generous, too, whenever he happened to have enough money. This is how Franziska Kugelmann described him, the daughter of Ludwig Kugelmann (1830–1902), a physician living in Hannover who had taken part in the revolution of 1848 and who shared a friendship with Marx which was characterised by respect of the younger for the older and by certain limitations, due to differences in political opinion, but which nevertheless remained cordial. Franziska tells us of the following characteristic episode, which occurred while Marx was staying with the family in Hannover for several weeks, a time Marx would later describe as an ‘oasis in the desert of his life’ (Institut für Marxismus-Leninismus beim ZK der SED 1964, p. 293).

There was hardly any conversation about Marx’s theory or his political position because he did not want to appear like a travelling preacher. When, on one occasion, someone inquired as to who was meant to clean the boots in the state of the future, Marx’s irritated response was: ‘You are going to do it.’ This let the inquirer fall silent, but the woman of the house later said to Marx: ‘I cannot imagine you . . . in a time of social levelling, as you have quite aristocratic inclinations and habits.’ He replied, ‘Neither can I. These times will come, but we must be gone by then’ (Institut für Marxismus-Leninismus beim ZK der SED 1964, p. 288, my transl.).

Kugelmann’s recommendation for this Marx, the one who behaved like a bourgeois academic and knew he identified with the customs of a time that was fast nearing its end, was to put political agitation on the back burner and to dedicate himself fully to the publication of the second and third volumes of *Capital*. It seems that the revolutionary demon in Marx thereupon urged him to break up his friendship with Kugelmann. Marx considered it his duty not only to interpret the world, but to change it, and if necessary with the use of force. The break, although painful for both sides, was never remedied (ibid., p. 316, my transl.).

Within the literature on Marx, Kugelmann remains the friend who encouraged him to include and develop the section on ‘The fetishism of the commodity’ in the first chapter of *Capital*, as Marx tells us in the postscript to the second edition (Marx 1990, p. 94).

To us, the ‘oasis in his life’ illustrates Marx as seen not by the Communist International but by social democracy, and it illustrates the character he sometimes, though not always, presented: namely, that of a German scholar who tried to find a path that would lead to a scientific solution of the social question. It was a path strewn with political battles, but these had to be fought fairly, and if reality did not correspond to the vision of the scholar, it was the latter that had to be adapted to the former.

Such a scholar and social democrat, with his peculiar strengths and weaknesses, was – or, at least, became – Rudolf Hilferding. While, in most cases, it seems appropriate to begin the introduction to the *Klassiker der Nationalökonomie* with a presentation of the author, followed by an exposition of the book, in this case we shall proceed in inverse fashion because there appears to be a remarkably close connection between Hilferding’s political successes and failures and the errors in his theoretical work.

The article that made Hilferding's name as an economist was his response to Böhm-Bawerk's critique of the third volume of *Capital*.¹⁹ Here, a young man confronted one of the most respected economists in the world regarding a question and a problem of which it is by now uncontroversial to say that Marx did not solve it in the right way – namely, the transformation of values into prices. Ever since it has been established that the theory of prices of production can be developed independently of the labour theory of value, there may at best be disagreement over the extent to which Marx's system needs to be corrected as a consequence of his failure.²⁰

Thus, from a modern perspective, only a few aspects of Hilferding's text appear to be of interest.

Hilferding shows little sympathy for the theory of marginal utility and for abstract forms of economic argument. Böhm-Bawerk's challenging claim that Marx did not provide any stringent justification for taking the labour theory of value as his point of departure and that this theory is, in our words, redundant because prices of production, given a certain rate of profit, are also dependent on the latter and thus have to be calculated separately (without any recourse to values), Hilferding opposes with a formal argument – namely, that prices of production are modified values – as well as with a historical one.

The formal argument is not taken any further than it had been in Marx. Hilferding is unable to say how the prices of production are to be determined if a profit has to be added to the costs of the means of production of an industry, and thus the fact that the means of production have themselves been bought at certain prices has to be taken into consideration. (At the time when Hilferding was writing, first attempts at a formal resolution of this problem had already been undertaken. But either he did not know of them, or he did not notice their importance).²¹ From a historical perspective, he claims that values are important because under conditions of simple commodity production (exchange of different products produced by independent craftsmen who are on equal terms), exchange prices must follow relative labour costs. Böhm-Bawerk had objected, as Ricardo had already seen, that the craftsmen cannot remain indifferent to the amount of time that various pieces of capital remain tied up in different branches of production. In principle, Hilferding's response amounts to no more than playing down the importance of the employment of capital in a craft economy. However, it would be impossible to describe what Marx meant by 'simple exchange of commodities' in terms of the labour theory of value.²²

Despite going astray in the main, Hilferding's early article is impressive because of its dense line of argument and its consistent emphasis on the remaining strengths of Marx's analysis. As an illustration, here is how Hilferding counters one of Böhm-Bawerk's objections:

Even if, as Marx declares, the total surplus value regulates the average rate of profit, this nevertheless constitutes but one determinant, while as a second determinant, completely independent of the first, and *likewise completely independent of the law of value*, there operates the magnitude of the capital existing in society. Now, apart from the fact that the magnitude of the social

capital is here assumed by Böhm-Bawerk to be known (which presupposes the law of value, since we have to do with the determination of the magnitude of a value), the objection has been expressly refuted by Marx . . .

(Hilferding 1904b, ch. 2)

In what follows this passage, Hilferding does not actually prove that the determination of value through labour has priority over the modification through the rate of profit – and, as we know today, such a proof is not possible. Nevertheless, his reference to the fact that Böhm-Bawerk assumes the magnitude of capital as given does, indeed, identify the latter's Achilles' heel, because modern discussions of capital theory have shown that Böhm-Bawerk's version of the marginal productivity theory of distribution must assume the value for the amount of capital as given, in order to be able to determine the rate of interest on the basis of supply and demand.²³

Hilferding's weakness is his own attempt to explain in more detail how supply and demand determine market prices. Like most authors who wrote before the advent of Neoclassical economics, he tries to interpret demand and supply as forces: if demand exceeds supply, prices rise; if there is a concentration of suppliers, the opposite is the case, and so on. These forces only allow us to explain price changes; they do not allow for the calculation of prices if the forces are evenly balanced. However, using the example of a balloon whose buoyancy is compensated by its weight only once it has reached an exact height determined by air pressure, Böhm-Bawerk had demonstrated that forces may very well balance each other out at the point of equilibrium market prices (just as they determine the height of the balloon), if offerings and quantities demanded depend on prices, as illustrated by the supply-and-demand diagram. Formal models were clearly not Hilferding's cup of tea, but insofar as this early article already touches upon problems of capitalist development and their vivid description and theoretical explanation, it announces a significant economic talent.

Marx continued the theoretical development of classical political economy and, similarly to the Historical School, put the development of the capitalist economy into an historical context. A logical and historical path leads from simple exchange economies to money economies and further on to commercial capital. Out of pre-capitalist forms of production, which were dominated by the crafts, grew a more sophisticated division of labour, capitalist manufacture, and finally the factory system. Out of the labour relations of the guilds, an urban workforce developed, which worked long hours during the Industrial Revolution but was later able to push through higher wages and shorter working hours as productivity increased and organisation improved. The feudal societies of late Medieval Europe transformed into the modern nation state with absolutism as their political form and mercantilism as their economic form. These slowly removed trade barriers and made it possible to deal with an increasing volume of international trade of goods on the basis of the gold standard. The circulation of metal currency was complemented with the use of bills of exchange and an increasingly differentiated credit system, which, according to Marx, had found its most progressive form in the English banking system.

At that point, marked by the institutions as they had taken shape by the mid-nineteenth century, Marx's analysis of the development ended, and Hilferding picked up the thread in order to explicate the state of affairs in 1910. At a time when the colonial world had been divided up without any remainder, the concentration of industry and banks and the intensifying rivalry among nations became the dominant themes. By bringing the discussion up-to-date, he took on the role of the leading Marxist economist. And he became a point of reference for the radical (later communist), as well as the moderate revisionist, wing (which had its base in the trade unions), while he himself tried to maintain a social-democratic middle ground. Various continuations and transformations of Hilferding's work led to Rosa Luxemburg's, Lenin's, and Schumpeter's theories of imperialism, which were meant to explain the power struggle between the major powers that became visible in the run-up to the Great War. Ninety years later, after two world wars and dozens of smaller conflicts, we have a more stable political world order, but pronounced forms of national economic rivalries remain. Although the structural context between industry, services, and the institutions which finance them has changed, Hilferding's explanations in this area have nevertheless remained pertinent.

In terms of his method, Hilferding was influenced by the dispute over value judgements and by neo-Kantianism, claiming that 'The practice of Marxism, as well as its theory, is free from value judgements' (Hilferding 1981 [1910], p. 23).

In terms of substance, the book begins with a part on 'Money and credit', which follows Marx's theory of money but juxtaposes market transactions as practiced by private owners first with the 'conscious' planning of a '*pater familias*' and then very quickly with the 'local, regional or national commissars of the socialist society' (ibid., p. 27). Not necessarily obvious to an uninitiated reader, the background to Hilferding's short polemic against the theory of marginal utility (ibid., cf. p. 27) and his commitment to the labour theory of value (ibid., cf. p. 29) is his earlier controversy with Böhm-Bawerk.

As in Marx, a *particular* commodity takes on the role of the universal equivalent and of money. Fulfilment of this role as universal equivalent becomes its use value. Marx's theory of the value-form is mentioned but not treated in any depth. The state not only has the right to mint coins, but may also issue token money as representatives of money. The value of metal currency outside the national borders, however, is solely determined by its weight (ibid., p. 59). As long as the value of money is determined by the costs of production (and, we may add, the volume of transactions remains the same), the quantity of money in circulation is determined by the velocity of circulation. To that extent, money is endogenous. Any excess in precious metal is removed from circulation in the form of jewellery, and so forth, because if there is temporarily too much precious metal in circulation, prices will rise, making the metal cheaper, and, as we would put it today, industrial demand for it will increase. This is what I would call the law of circulation. Looked at from the opposite perspective, the quantity theory of prices applies when the state issues token money. Hilferding acknowledges '... that a real problem results from any such arrangement, namely, the limits of this conscious social regulation by the state' (ibid., p. 379, note 6).

Hilferding illustrates this with Austria's inconvertible paper currency, which had been introduced in 1859. If free coinage is disallowed and the currency is thus 'frozen', coins may circulate with a deviating value. The metal value may be less than the purchasing power of the coin, while the reverse case can exist only in the short term, because, whether legal or not, coins will be melted down if their metal value is higher than their purchasing power.

What, though, determines the relationship between the purchasing power of a coin and its metal value? The quantity theory, in any case, does not apply strictly, as Tooke showed, although, Hilferding admits, in the case of paper currencies there is no other explanation available (*ibid.*, cf. p. 47). Finally, Hilferding also turns away from the determination of the purchasing power of gold through the costs of its production. In 1912, in an article presenting an interpretation of his own *magnum opus*, he wrote,

The adherents of quantity theory, but also others, have repeatedly made attempts at deriving price changes from changes in the volume of the production of gold or the cost of its production. Such attempts invariably failed completely.

(Hilferding 1982a [1912], p. 51)²⁴

Hilferding further mentions a regulation of the circulation of paper money so that the purchasing power remains stable, and continues,

And in the same way, the gold coin has a stable value. The only difference is that gold, as opposed to paper, also has intrinsic value. However, this intrinsic value would be a different one without its use as money: it would be lower and it would always fluctuate with the cost of production.

(Ibid., p. 54)

Thus, at this point Hilferding already introduces the state as an institution which successfully intervenes in and regulates the economic process. There is an 'unlimited demand' for gold from central banks, and thus it retains a value above its cost of production.

Hilferding's argument is also easy to follow when he shows how bills of exchange and notes replace metallic coinage. Credit is primarily given to enterprises in the form of circulation credit or capital credit, while at the same time the unemployed reserves of the enterprises become deposits at the banks and thus take the place of bills of credit. It is capital credit which changes the position that the bank takes towards the industry, as the bank now needs to take an interest in the long-term fate of enterprises. 'At the same time the bank's influence over the enterprise increases' (Hilferding 1981 [1910], p. 95), because if there is a decrease in business turnover, 'additional capital' is required, and the bank 'always disposes over capital in its liquid, readily available, form' (*ibid.*, p. 95).

As in Marx, at this point it becomes the use value of capital to bear interest, an interest which may, by necessity, only temporarily exceed capital gain. As the notion

of interest is derived from the relations of production, it appears that Hilferding considers that capitalism without money lending is possible, i.e. a capitalism without interest but with profit (Böhm-Bawerk had taken the opposite view and considered interest to be the primary phenomenon). Hilferding's determination of the interest rate at first seems to be entirely flawed because, following Marx, he imagines it to be the result of supply and demand, without however (as mentioned previously) having a clear theory of supply and demand at his disposal. But he nevertheless achieves some plausible description in tracing the changes in interest rates over the economic cycle: the interest rate is moderate during times of economic up-turn and optimism, it rises during peak times of economic up-turn when a crisis is in the making, and it reaches its highest point when the monetary crisis and increasingly frequent insolvencies of debtors worsen the crisis of production.

The quantity of money is subject to endogenous fluctuations. Although, following Peel's Bank Charter Act, there was an upper limit for the emission of notes, the circulation credit which the 'agents of reproduction' lend to one another, Hilferding says, represents the largest share. Here '... both the demand for and the supply ... of such commercial credit increase together, and *pari passu* with the expansion of production. The expansion of credit is possible without any effect on the rate of interest, ...' (ibid., p. 103).

This situation is characteristic in the early phase of an economic up-turn. Along with the volume of credit, bank deposits and the quantity of money increase. The interest rate is bound to rise later, once the gold reserves of the banks decrease relative to other forms of money.

It is typical of Hilferding that he accepts Marx's theory of the diminishing rate of profit without seriously questioning it, while at the same time concluding from an interpretation of statistics that there have been no long-term tendencies towards falling interest rates since the eighteenth century. Thus – and this conclusion is just as typical for him – the power of finance capital expands. If shares are issued for an enterprise, all of the owners taken together receive an income that equals the profits. And if the profits are assumed to be continuous and roughly constant, it can be capitalised, like rent, according to the rate of interest. This capitalisation, then, defines the value of the shares, which represent the entitlement to this income. Hilferding does not waste much time over the various risks associated with different investments and the modifications of this approach which these would make necessary. Marx called the shares themselves 'fictitious capital'. As the rate of interest is lower than the rate of profit, the value of fictitious capital is higher than the asset value of the enterprise which creates the profit. The difference ends up in the pockets of the company seller, and Hilferding calls it the 'promoter's profit'. This is probably the most famous of his conceptual clarifications, and it seemed to explain a plethora of empirical phenomena which became more and more frequent in his time.

We may today still use the concept of promoter's profit for the purpose of illustration. It helps demonstrate the different interests of an enterprise's uniform management and of the potentially diverse financial institutions financing it. As a rule, rather than an enterprise distributing all of the profits, dividends

are paid out, which still allow the enterprise to invest and build up reserves. This leads to a smaller margin between the value of real and of fictitious capital (if we may hold on to this somewhat questionable concept). However, Hilferding does not try to understand this margin as an imbalance that must disappear in the long run. He is not – like most Neoclassical (and also many Classical) economists – looking for mechanisms that might lead to an equalisation of the rate of profit and the rate of interest. In part, this is due to theoretical ignorance (Wicksell is mentioned nowhere), in part to theoretical weakness (this is where it would have made sense to go beyond Marx's theory of distribution). Nevertheless, Hilferding's approach remains fruitful because, in fact, imbalances often do not, or do not fully, level out as a result of quantitative shifts, and instead qualitative changes and new institutions emerge, to which the existing tensions, so to speak, are passed on or in which they are stored. In Hilferding, these are the mechanisms of concentration and of the interconnections between industrial and banking capital.

Individually owned enterprises turn into joint-stock companies, which do not, as Marshall once said, 'stagnate', because the 'single big capitalist', as well as the managers of 'industrial bureaucracy' (*ibid.*, p. 122), have a vital interest in controlling and furthering the enterprises they own. The promoter's profit provides the joint-stock company with the power to expand because more capital is mobilised. However, it can also follow a strategy of retaining profits. A private entrepreneur is, in the first place, tied to his equity capital, and he will be given credit only by someone who knows him well. For a joint-stock company it is, by comparison, easier to acquire capital from a bank, because within certain limits it can make repayments by additional emissions. Thus, it can gain a technical dominance, as well as dominance in the price battle.

Hilferding's intention is less a theoretical analysis of the logic followed by model processes (for that he somewhat narrow-mindedly relies on Marx, more or less) and more an attempt to clarify the logical genesis of institutions. Thus, he next turns his attention to the stock exchange, because there is a need to trade fictitious capital. He does not altogether miss the fact that speculation provides information, as he emphasises that those familiar with the strategic policies of enterprises earn more with speculative deals. But there is no reference to the fact that these additional earnings also provide information.²⁵ Because the value of fictitious capital fluctuates with changes in the interest rate, he follows Marx's understanding of it as a 'crazy form'. And he accuses Böhm-Bawerk of having founded his theory of the interest on capital, in the style of the Scholastics, upon the illusion of the 'mere passage of time' producing interest (*ibid.*, p. 150). Thus, value-free science in the end also becomes infused with polemics.

But soon thereafter, Hilferding himself faces the difficult problem of analysing the gain of banks and their rate of profit. He maintains, 'The difference between the interest which the banks receive as creditors and the interest which they pay as debtors constitutes their net profit' (*ibid.*, p. 172).

Hilferding ignores fees and expenses. Within the framework of Marx's theory, the surplus value is derived from commodity production, and thus a limitation is

introduced: 'This profit is not, therefore, profit in the strict sense, and its level is not determined by the average rate of profit' (ibid., p. 172).

The difficulty of the question lies not in the calculation of profits, but rather in the definition of the expenditure in relation to which the profit is to be measured when compared to other forms of capital investment. In this context, we come across the following surprising formulation:

It is evident that what is important is not the banks' own capital, since their profits do not depend upon this, but the total loan capital at their disposal. The basic datum is the level of profit, and the amount of their own capital must be adjusted in accordance with it. The banks can convert into their own capital only as much of the total loan capital as their profits allow. . . . The bank's own capital must hence be reckoned in such a way that the profit on it is equal to the average profit.

(Ibid., pp. 172f.)

In order to understand what is meant here, it might be useful to employ a model. Let us assume that the assets of an individual manufacturing enterprise (say, an agricultural enterprise) consists of seeds, machinery, buildings, and so forth, and its liabilities of obligations towards the supplier of fertilizer, the local cooperative bank, and so on, and its equity capital. If we follow textbook logic, reserves (R) and loans (L) are entered as assets by a bank and the deposits (D) as liabilities. However, in the context of our question, to the liabilities we must also add the equity capital (E), which does not make any significant difference in the short run (a point also indicated by Hilferding), but which gains importance as securing the loans in the long run. In the model of Philipps (1920), here applied on the basis of Niehans, the values are related by fixed coefficients, similar to the way in which the production function connects input and output in linear fashion.²⁶ These fixed coefficients are based on empirical values and reflect risk and uncertainty. A theory that wanted to probe deeper would need to make them the actual object to be explained, rather than a tool to be used. Nevertheless, they can help us in clarifying the connections and then formulate some possible further explanatory paths.

First, the following accounting equation applies

$$R + L = D + E.$$

In order to maintain liquidity, the bank needs a minimal reserve in proportion to the deposits which customers may wish to withdraw. A minimum may be required for this proportional reserve (ϱ). We write,

$$R = \varrho D.$$

As far as the bank's loans (L) are concerned, the credit-worthiness of the bank's debtors is important. Trustworthy debtors with long-term loans will be served preferentially by the bank. Nevertheless, as the bank can never be fully certain of

the monetary reflux, its equity capital represents the security. In analogy to ϱ , we define a coefficient ε for the minimal backing of loans by capital

$$E = \varepsilon L.$$

The deposits (D) have two different sources. One of them, (D^{**}), is the part of the loans that are made which remains with the bank, insofar as the debtors do not immediately spend all of the credit given to them but rather leave a certain amount of it in their account at the bank. For this empirically given proportion (ϱ) of the loans (L), we can thus write

$$D^{**} = \sigma L.$$

Post-Keynesian theorists usually infer additional deposits and reserves from additional loans, because a central bank is available for refinancing. However, state-backed guarantees are not assumed in our case. What provides the bank with room to manoeuvre in this case are the other deposits (D^*) that are primarily made up of money which other savers give to the bank (savings from wages, etc.). These kinds of deposits extend the bank's balance sheet, as with (D^*) the quantity of R also increases, and new credits (L) can be granted, which lead to further deposits (D^{**}). The system of equations ends

$$D = D^* + D^{**}.$$

In a next step, it is possible to calculate multipliers, which represent the other variables in their dependence on (D^*). Following a step-by-step elimination of the other variables, we get, in particular,

$$E = \frac{(1-\varrho)\varepsilon}{(1-\varepsilon) - \sigma(1-\varrho)} D^*.$$

The complex multiplier, which modifies (D^*) in the preceding formula, stands for the extent to which additional savings deposited at the bank allow up to a certain level additional loans to be made without decreasing the bank's liquidity. But they require to be secured by additional equity capital. Here, everything depends on the profits. Given a certain volume of loans and deposits, equity capital increases, for instance, when the bank, in the course of its day-to-day business, enters the income of a cash payment of interest in its books, which is added to the reserves. In favourable circumstances, the bank may also raise its equity capital through the further emission of shares and the associated promoter's profit.

This model illustrates Hilferding's idea, mentioned previously, that a bank, assuming a given rate of profit, can 'convert into their own capital' a proportion of its 'loan capital'. Within the Philipps model, this proportion is determined with the help of coefficients which are based on banking practices and risk management, while Hilferding uses the average rate of profit for this purpose. In slightly simplified form, the two ideas can be combined by assuming that banks may be

able to expand their business and their capital through additional deposits, loans, and profits, but only with diminishing success, because they are in competition with one another, and thus the expansion of individual banks is eventually limited by the difficulty of securing additional loans with long-term equity capital.

In the case of banks, problems of non-liquidity and of insolvency are difficult to tell apart, because, on one hand, in most cases the difficulties of a bank that has become insolvent due to bad debtors shows in public only once it is no longer liquid, and, on the other hand, because the creditworthiness of the long-term debtors of a bank that is experiencing short-term difficulties with liquidity is usually questioned, with the consequence that the central bank, as the lender of last resort, finds it hard to fulfil its responsibilities. The standards and guidelines for the required levels of equity capital of banks are currently the subject of detailed international discussions in economic theory and policy, and Hilferding's reflections could enrich these debates with their idiosyncratic perspective.

In any case, Hilferding is convinced that in principle, the profit rates of banks must approximate the general average rate of profit. As evidence for this, he mentions the fact that promoter's profits can also be made with the capital stock of a bank. The loan capital of an individual bank is therefore not necessarily invested directly in the industry but is turned into bank capital, and the bank capital acquires shares of industrial capital. In Hilferding's own words, 'fictitious capital has been doubled' (Hilferding 1981 [1910], p. 177). He sees this process as analogous to the 'doubling' of commodities into commodities and money, which Marx observed in his analysis of the transition from barter to money economies.

There are asymmetries within the movement of capital. 'Its conversion into industrial capital, of course, occurs only once, and once for all. Idle capital is converted definitively into money capital, and this, in turn, into productive capital' (*ibid.*, p. 251).

Parts of stock capital can be sold off at any time, as opposed to parts of an industrial facility. Thus, the capital market is not homogenous, and the rate of profit (according to which the profitability of an enterprise is measured) is higher than the rate of interest (which provides a standard for dividends). At this point, Hilferding turns toward the question of imperfect competition. Here, his characterisation makes use of distinctions which cannot always be mapped onto the concepts of modern theory. Nevertheless, it is of more than just historical interest. Worth mentioning in particular are 'combinations' of extractive and manufacturing industries, i.e. vertical concentration, leading to a levelling out of the rate of profit, which oscillates across the economic cycle. A cartel is understood as a consortium which may take either a partial form (in which case it is dominated by the market) or a monopolistic form (in which case it dominates the market). A trust is a 'monopolistic merger' (Hilferding *ibid.*, p. 198). Thus, Hilferding distinguishes between forms of association not only according to market conditions, but also on the basis of technology (e.g. extractive versus manufacturing industries) and organisational form. He does not idealise associations, as sometimes happened within the Historical School (Schmoller). Cartels are by no means 'democratic'.

Imperfect competition leads to higher profits and promoter's profits and thus to a greater interest of banks in the industry, while at the same time the concentration of banks provides larger volumes of financial means to the cartels.

I call bank capital, that is, capital in money form which is actually transformed in this way into industrial capital, finance capital. So far as its owners are concerned, it always retains the money form; . . . But in reality the greater part of the capital so invested with the banks is transformed into industrial, productive capital.

(Ibid., p. 225)

About commercial capital, which stood at the beginning of the development, Hilferding says that its 'decline is definitive', because finance capital is ' . . . transforming the once proud merchant into a mere agent of industry which is monopolized by finance capital' (ibid., p. 226).

However, Hilferding's remarks on price formation are not very satisfactory:

The ultimate outcome of this process would be the formation of a general cartel. The whole of capitalist production would then be consciously regulated by a single body which would determine the volume of production in all branches of industry. . . . Price would then cease to be the outcome of factual relationships into which people have entered, and would become a mere accounting device by which things were allocated among people. . . . A part of the output would be distributed to the working class and the intellectuals, while the rest would be retained by the cartel to use as it saw fit. This would be a consciously regulated society, but in an antagonistic form.

(Ibid., p. 234)

Industrial mergers are accompanied by mergers between banks:

If this trend were to continue, it would finally result in a single bank or a group of banks establishing control over the entire money capital. Such a 'central bank' would then exercise control over social production as a whole.

(Ibid., p. 180)

All Hilferding has to say about finance capital overall is 'Thus the specific character of capital is obliterated in finance capital. Capital now appears as a unitary power which exercises sovereign sway over the life process of society; . . .' (ibid., p. 235).

A reader today must remember how little the academic discipline of economics had at its disposal to oppose this eloquent interpretation of capitalist development. Only with the work of Schumpeter, around the same time as Hilferding, did a genuine theory of capitalist development emerge out of Neoclassical economics.²⁷ Hilferding's exaggerated views of the tendency towards concentration and his idealisation of the planning capacities of large-scale enterprises had a detrimental influence because they fed illusions over the degree to which the economy and society could be planned and directed.

Hilferding's theory of the economic cycle consists of two main elements. One is a questionable theory of the oscillations in industrial production itself, based on disproportional developments within individual sectors. The other element, which is very close to modern post-Keynesian analyses, is a fascinating emphasis on movements caused by monetary factors, and it includes in particular very vivid and clear descriptions of financial crises. When reading Hilferding, it would be a pity to leave out his amusing historical illustrations (e.g. *ibid.*, pp. 273f.) or his comparison of the specific course which financial crises take in the powerful nations at the time as a consequence of their different institutions (e.g. *ibid.*, p. 278, on the United States). His belief in progress shines through in these passages as well. There are advantages to imperfect competition, because large enterprises cannot go bankrupt so easily (*ibid.*, p. 289), the liquidity of the system overall improves due to the expansion of credit granting institutions, gold is needed almost exclusively only for international payments (*ibid.*, p. 291), the German system of universal banking proves advantageous over the English (*ibid.*, p. 293), and, finally, even psychology undergoes changes: old-style romantic speculations, such as the one that led to the South Sea Bubble, Hilferding says, 'all gave way to the naked quest for marginal profit, which came to an end in the crash of 1873' (*ibid.*, p. 294). The new institutions are not able to avoid crises altogether, but nevertheless a certain moderation of extremes takes place (*ibid.*, p. 298).

Those of Hilferding's contemporary readers who shared these hopes of his, without suspecting anything like the events of 1929, surely agreed even more with his fears. A war was approaching. In principle, free trade would be the best option under capitalist conditions:

There can be no doubt, therefore, that at an advanced stage of capitalist production free trade, which would amalgamate the whole world market into a single economic territory, would ensure the highest possible labour productivity and the most rational international division of labour.

(*Ibid.*, p. 311)

However, customs policies are not only an instrument for the protection of young industries in developing countries, but also a weapon in the battle between rivalling nations. These not only want to maintain their economic territories; they want to extend them. Capital export means the '... export of value which is intended to breed surplus value abroad' (Hilferding *ibid.*, p. 314).

The home country wants to keep control over the exported capital. But colonial policies are not conceivable without violence. Although capitalism itself '... gradually provides the subjected people with the ways and means for their own liberation (*ibid.*, p. 322), meanwhile, in Europe, we see 'more or less identical, and hence competing, entities confronting each other in hostile fashion' (*ibid.*, p. 328).

In particular, there is a 'disparity which exists between the development of German capitalism and the relatively small size of its economic territory' (*ibid.*, p. 331), while England, due to its satellites, and Russia, as a future competitor, both possess 'a vastly larger economic territory'. This constitutes 'a situation which is bound ... to lead towards a solution by force' (*ibid.*, p. 331).

The ideology of the bourgeoisie adapts to the needs of finance capital. It is not a liberal ideology but one aiming at domination (*ibid.*, p. 334).

Hilferding is less certain about the position which the proletariat takes, and will take, toward imperialism – though he knows very well which position it *should* take. He realises that the interests of the national labour force become tied to those of the national finance capital, yet the answer, he thinks, can only be socialism.

The discussions about Hilferding's theory of imperialism continued for decades; both Luxemburg and Lenin took Hilferding's ideas as their point of departure. Schumpeter, too, did not at all deny the historical phenomenon of imperialism but considered it to be an essentially sociological phenomenon characterised by non-capitalist elements.

Hilferding's idea of an increasingly planned allocation in the course of the capitalist development culminates in his concept of 'organised capitalism'. The war economy had been planned. The tendency toward concentration had continued and even accelerated:

The socialisation of the labour process in large-scale enterprises has progressed into the socialisation of the labour process in whole branches of industry, and into the association of the socialisation of these branches with each other. This leads at the same time to an increased conscious ordering and planning of the economy which strives, on the basis of capitalism, toward overcoming the eminent (immanent) capitalist anarchy of free competition. If this tendency would prevail without any resistance, the result would be an organised economy, but one organised in an antagonistic and hierarchical form.

(Hilferding 1982b [1924], p. 168)

The notion of an organised economy was already discussed prior to the Great War: '... the term "organisation" was on everyone's lips', writes Nörr (1994, p. 435, my transl.). Sinzheimer, a constitutional lawyer, demonstrated how an economy with social welfare elements might be legally constructed from the perspective of the jurist. As an empirical example, he used the regulation of the coal industry in 1919. It was organised in the form of cartels, and the individual coalmines could be forced to join the cartel responsible for them. 'All these enforced cartels were integrated into the "Reichskohlenverband" [Reich's coal association] which was nothing but a huge cartel at the level of the Reich.' The 'Reichskohlenrat' [Reich's coal council] could be 'called an estate assembly, an assembly of the coal estates' (*ibid.*, p. 445, my transl.).

The national economists had moved on from the discussion of stages in economic development to that of different economic styles and systems, and historic transitional forms between planned and market economies were studied for their contemporary relevance.²⁸

In Hilferding's view, organised capitalism showed traits which he had already described in *Finance Capital*. Thus, for instance, competition over prices was complemented with competition over the introduction of new products, new technologies, new supply sources, and new forms of organisation.²⁹

However, along with a different understanding of the state, Hilferding's economic observations also changed. The state was no longer the executive organ of the dominant class but a force resulting from the various intentions of the different classes and parties. Democracy did not allow for the equality of all citizens, but it made possible a selective process into which everyone could enter with equal chances.³⁰ And Hilferding now spoke of an 'economic democracy', which was meant to become 'the substance of the policies of labour organisations'. Within the framework of a bureaucratically organised economy, opportunities for advancement became available to its members: 'With this, trade unions stop being merely organs of social policy and become bearers of democratic production policies' (Hilferding 1982b [1924], p. 172).

This, finally, lets Hilferding formulate the following optimistic question:

Will this lead to a weakening of the tendencies toward war, and will it make possible a form of politics that we may call a realistic pacifism? Does capitalism really equate with war, so that only its complete overcoming could guarantee peace, or is it after all possible to create new forms of a world order with the help of strict policies which limit the sovereignty of individual nation states in favour of a supra-national organisation? Is it not possible that in this area, too, the space for evolutionary development is much larger than hitherto has been assumed?

(*Ibid.*, p. 179)

Hilferding had always kept his distance to the totalitarian form of Marxism. In one of his last articles, he argued against the Trotskyist thesis that the Soviet Union was a case of state capitalism, saying, 'A state economy, however, eliminates precisely the autonomy of economic laws' (Hilferding 1976, p. 512).

Bureaucracy, he writes, is heterogeneous; Stalin, by contrast, is a case of 'an unlimited personal dictatorship' (Hilferding 1976, p. 515). Against earlier Marxist views, history has taught us that the '... "administering of things", ... may ... not only lead to the emancipation of the state from the economy but even to the subjection of the economy to the state' (Hilferding 1976, p. 517).

Following von Mises, one would be inclined to substitute 'must' for 'may'.

How did such a thinker cope with the realities of the twentieth century? In answering this question, we shall mostly follow William Smaldone's book on Hilferding.³¹

Rudolf Hilferding was born on 11 August 1877 as the son of Polish Jews who had emigrated to Vienna. His father was employed by the Allianz insurance company as a cashier. His son grew up in moderate wealth and in the liberal atmosphere of the assimilating Jewry. Until his school-leaving examination in 1894, he attended a state school.

We know that Hilferding's interest in socialism was already awakened at the early age of sixteen, that he took part in May Day demonstrations, and that Karl Renner valued the young man. Hilferding's biographer is less clear about the reasons why he turned away from the bourgeoisie, mentioning instead some stereotypes about Vienna at the turn of the century, the role of the Jewish intelligentsia,

and common characteristics of Jewish thinkers, such as their moral feeling, their awareness of historical relativity, and their determinism.

Hilferding studied medicine, but he also attended lectures by Carl Grünberg, who was one of the few Marxists at a university and would later become the first director of the Institute for Social Research. Hilferding also followed lectures by Ernst Mach, whose materialism represented a counterbalance to the influential neo-Kantianism. The debate about Bernstein and revisionism was another part of this stage in Hilferding's intellectual formation. Austria's Social Democratic Party, under the leadership of Max Adler, was reformist in its practical policies, while containing original theoretical thinkers. The movement of Austro-Marxism was looking for a middle ground between the wings of social democracy, and Rudolf Hilferding soon became one of its leading figures regarding economic questions. The critique of Böhm-Bawerk was his first important contribution. Initially, Hilferding sent it to Kautsky for his *Die Neue Zeit* in 1902, and he was very disappointed when Kautsky rejected it. Nevertheless, their correspondence over the article was the beginning of their friendship. (Eventually, the article appeared in Adler and Hilferding's *Marx-Studien* in 1904). Kautsky's main reservation had been that it was too long, but he encouraged Hilferding to write other contributions. Hilferding's friendship with the respected theoretician in Marx's succession would survive the decline of Kautsky's reputation and influence after the Great War.

During the same years, Hilferding was also interested in the customs and trade policies at the time, arguing against the revisionists' support of protective tariffs, and he set out on his critique of imperialism. Thus, the main ideas that would later inform *Finance Capital* were already present at that stage. He placed his hopes on universal suffrage as preparing the path to socialism, while, however, thinking that a general strike might nevertheless be necessary in order to secure the development toward socialism, which he did not consider as automatically given. The Russian revolution of 1905 gave additional impetus to this more radical idea.

Kautsky wanted Hilferding to give up medicine altogether, in order fully to devote himself to work for the party. But Hilferding married a physician, Margarethe Hönigsberg, also of Jewish descent and also a socialist. In 1904, their first child, Karl Emil, was born. In 1906, Bebel offered Hilferding a regularly paid post at the party's school, and this time the young couple decided, if not without hesitation, to move to Berlin where Mrs Hilferding was not allowed to practice medicine because she was a foreign national. Social democracy was strongly on the rise in Berlin. In 1906, there were just short of 400,000 signed-up party members, and this figure grew to more than one million in 1912. The trade union movement showed a similar trend. With 34.8 per cent, the Social Democrats were the strongest party in the Reichstag. And it was not just a political party; it also offered practical help to the workers. As a disciple of Kautsky, Hilferding was meant to keep the party's wings together, and in 1914, at the age of thirty-seven, he was close to the party leadership. In that phase of his life – when *Finance Capital* appeared and immediately exerted widespread influence, sparking off

lively discussions and eliciting reviews and replies – Hilferding did not believe that social democracy could be integrated into the existing political order, despite the fact that he was in his own way working toward achieving just that.

He led a simple life, his biographer tells us, worked hard, regularly went on holidays with his family, and maintained the Viennese custom of occasionally visiting the coffee house whilst in Berlin. Trotsky despised him for not being revolutionary enough and also because he kept his distance from Luxemburg and Liebknecht. He thought that the international working class should support neither the Triple Alliance (which wanted to extend the colonies) nor the Entente (which insisted on keeping theirs). When the war broke out, Hilferding opposed it, felt pushed out of the party, and took up a revolutionary position. In 1915, he was drafted by the Austrian army, and he did his service in various hospitals, most of them far from the front line. At least in the form of writing, he could continue to be politically active. It was during that time that he developed his concept of ‘organised capitalism’. Democratic socialism was meant to be the alternative to it.

Despite the fact that after the war, Hilferding took a position even further to the left – he was by now a member of the USPD and the editor of its main journal, *Die Freiheit* – he still believed in parliamentarism, causing Lenin to publish a rant at him in *Pravda*. Hilferding, in turn, wrote against the bolshevist terror. Toward the mid-twenties, he began to realise that the left needed to form an alliance with the parties that formed the political middle ground in Parliament. He returned to the Social Democrats, and in 1923 he became the editor of the SPD’s new organ *Die Gesellschaft*. After his experiences with the council republic, which he rejected, he rather saw a potential in the development of a democratic economy. In contrast to Marx, he did not believe that agriculture could be organised in the form of large-scale capitalist enterprises. Independent farming needed to continue, and all the state can do is help farmers enjoy more steady sales. Hilferding also began to adopt Kautsky’s theory of ultra-imperialism, i.e. the thesis that the large capitalist powers have the option of agreeing with one another in the style of a cartel. These changes in his thought were well received within social democracy, while they were sharply rejected by the Communists. The crisis of 1929, finally, was seen as putting a question mark to the thesis of an organised capitalism.

Twice, Hilferding acted as finance minister in the Weimar Republic. In 1922, he was among those requesting the stabilisation of the currency. Upon the formation of a great coalition under Stresemann in the summer of 1923, he was put in charge of the ministry of finance for the first time, although he had hardly any administrative experience. He was aware that a stabilisation of the mark was unlikely to occur before an end to the Ruhr struggle. We do not have the space here to go into any detail about the various reforms he suggested regarding monetary policies. Most of all, Hilferding requested an end to the printing of money, tax rises, and gold backing for the money that was in circulation. It remains a matter of debate to what extent his dismissal and replacement with Luther as finance minister in the autumn of 1923 was a consequence of the fact that his suggestions affected the interests of strong economic factions or of a lack of practical assertiveness on his part.

Stresemann's Social Democratic minister of justice, Radbruch, was of the opinion that Hilferding's theoretical indecisiveness meant that he was too hesitant in making his decisions. Brüning's and Alex Möller's appraisals of him were more positive. In retrospect, Möller, the federal minister of finance, considered Hilferding's strategy correct and its implementation energetic; he was stunned, he said, 'that my party would tolerate the downfall of our financial expert at this historical moment' (Möller 1971, p. 15, my transl.). Hilferding himself would later claim that the SPD's decision to join Stresemann's government had saved the democracy.

Hilferding, the Weimar minister, married a second time; Rose Lanyi was also a physician (and a translator). He had to endure hostilities, such as those from Korsch, who called him a Social Democratic agent of capitalist wars, and there were anti-Semitic remarks. He moved around in Berlin society and appreciated good wine and good cigars.

When in 1928 the SPD, then the largest party, was once more prepared to enter into a great coalition, Hilferding was again appointed as finance minister. The unemployment figure stood at one million, national debt was high, and numerous compromises, beginning with compromises over armament policies, had to be accepted within the cabinet. The experiences of 1923 had made Hilferding wary of inflation, and he hoped to be able to improve the economic situation by a reduction of income tax and by balancing the budget through cutting expenditure and increasing indirect taxes. He also joined those asking for a lowering of the reparation claims. In December 1929, following the stock market crash, Hilferding wanted to continue with his bundle of economic measures, while the president of the Reichsbank, Schacht, demanded that more efforts be made to balance the budget, because the reduction in reparations under the Young Plan did not constitute sufficient relief for the state finances. Hilferding was once more pushed out of government. Thus, the leading Marxist economist had, for the second time, kept to mostly economically orthodox policy measures during a time of crisis and for the second time had failed with them.

When, as a replacement for Brüning's strategy of deflation, plans for combating the crisis with job creation schemes were discussed in 1932, Hilferding declared it to be his duty to defend Marxism and a healthy currency. In the crisis theory of *Finance Capital*, the shortfall in demand indeed plays no essential role (the downturn is caused by a disproportionality in production and aggravated by a credit crisis), while money in Hilferding's theory never quite becomes independent of the gold standard, despite the development of all kinds of credit money, and despite the fact that he acknowledges that paper money with stable purchasing power is logically possible. His theory of the economic cycle did not provide for the possibility of a continuing depression. A book can be great in spite of its mistakes, but it is unfortunate when, in a historically novel situation, precisely these mistakes turn out to be the reason for the defeat of the book's ideas.

Hilferding had his own way of finding an agreement with Brüning. The latter held on to his strategy of deflation, mainly on account of foreign policy concerns. Hilferding held on to it for economic reasons. In 1932, when Strasser gave his

speech on the job creation scheme of the National Socialists in the Reichstag, Hilferding delivered the speech in response without being able to prove Strasser wrong on economic grounds. Social democracy was unable to defend itself against Hitler. By March 1933, it was all over: following the vote on the enabling act, Hilferding fled with Brüning's help, via Denmark and Paris to Zurich, where he stayed until 1938. Here, he designed his theory of totalitarianism and tried to encourage those SPD-politicians who had remained inside the Third Reich to become more active in their resistance.

In 1940, by which time he was in the Vichy-governed South of France, he tried to emigrate to the United States. First, he was refused an entry visa. Then, after it had finally been granted, the French authorities refused him permission to leave the country. Shortly before trying to flee to North Africa by ship, he was arrested by the French and kept in custody over several months. He was brought to Vichy, the French police handed him over to the Gestapo, and in the prison La Santé in Paris, he allegedly took his life by taking an overdose of Veronal.

Notes

- 1 See Wagner (1966 [1937]).
- 2 See Wagner (1966 [1937], p. 348).
- 3 A point made by Karl Marx, among others. See Marx (1992, pp. 505–19).
- 4 See Keynes (1971 [1930], p. 184): ‘If the market rate of interest moves in the same direction as the natural rate of interest but always lags behind it, then the movements of the price level will tend, even over longish periods, to be in the same direction as the movements of the rate of interest’ (p. 184).
- 5 Fisher recognised this as early as 1907. See Fisher (1994); on his explanation, esp. p. 259 and p. 320; tabular evidence, p. 319.
- 6 See the ‘Round Table Discussion’ on ‘Accumulation, Effective Demand, and Distribution’, in Bharadwaj and Schefold (1992, pp. 375–464).
- 7 I would like to thank Mr K. Oppermann for valuable advice on the following estimations.
- 8 See Schefold (1989a), Part One.
- 9 See Schefold (1991a). We have $(1 + R)\mathbf{qA} = \mathbf{q}$, $R\mathbf{qA} = \mathbf{q}(\mathbf{I} - \mathbf{A})$, thus $R = \mathbf{q}(\mathbf{I} - \mathbf{A})\mathbf{p}/\mathbf{Ap} = Y/K$. $1/R$ is therefore the capital-output ratio of a system with standard proportions. Even where the levels of activity of a real system deviate from those of the standard system, the capital-output ratio should at least not change in order of magnitude.
- 10 See Schefold (1997e), ch. 18.
- 11 In order to strengthen our argument even further at this point, let us take a look at the elasticity of the price index in relation to the rate of profit. If the rate of interest rises from 5 to 6 per cent, this corresponds to a rise of 20 per cent with regard to the starting point. As a percentage, this is identical to an interest rate rise from 20 per cent to 24 per cent. The elasticity, if we set $g = 0$ and $r = i + u$, is given by the following formula:

$$\frac{\frac{ds}{s}}{\frac{dr}{r}} = \frac{ds}{dr} \frac{r}{s} = \frac{R}{(R-r)^2} \frac{R-r}{R} r = \frac{r}{R-r}$$

The elasticity is zero to begin with and tends to infinity as we approach the maximum rate of profit. For $R = 25$ per cent and $r = 10$ per cent, elasticity is $2/3$. Thus, a rise of

r to 12 per cent, i.e. by $\frac{1}{5}$, should already lead to a price rise relative to monetary wages of $(\frac{1}{5})(\frac{2}{3}) = 13$ per cent. With $u = 7$ per cent, a rise in the interest rate from 3 per cent to 5 per cent would suffice for producing the same effect.

- 12 In the case of so-called intensive differential rates, the existence of the standard commodity is not guaranteed. We ignore this difficulty in the present context (see the previous note).
- 13 As the present analysis is significantly simplified if a is constant, let me point out once more that rents will be constant if the net product (after subsistence consumption goods [Lohngüter] purchased with wages have also been subtracted) produced on land which yields rent is proportional to the standard net product. In principle, the proportion of rent can also be larger than 1. In order to see this, it suffices to imagine a Ricardian corn economy in which there is a single piece of land which yields no rent and on which corn is produced using the same process as the one that applies to the standard system, while the main bulk of the corn is produced on numerous other pieces of land with better soil.
- 14 See the entry 'Bank of England', in P. Newman, M. Milgate, and J. Eatwell (eds) (1992), *The New Palgrave Dictionary of Money and Finance*, vol. 1, pp. 164–6.
- 15 See Clapham (1958, p. 285).
- 16 See 'Walter Bagehot', in *International Encyclopaedia of the Social Sciences*, pp. 498–503.
- 17 See Schefold (1996c).
- 18 See Marx (1966, pp. 247–62; esp. pp. 251f.).
- 19 See Hilferding (1904a), here quoted after Hilferding (1973); see Böhm-Bawerk (1896).
- 20 See Schefold (1989a).
- 21 See Quaas (1992).
- 22 Attempts at making use of the labour theory of value are still being undertaken. See the volume *Elemente zur Kritik der Werttheorie*, ed. by Friedrun and Georg Quaas (1997). In my contribution to this volume, 'Wert und Preis im historischen Kontext' (Schefold 1997h), I tried to solve the problem of different price models for historically different economic systems with the tools of modern theory.
- 23 See Schefold (1994d).
- 24 All translations from this text are mine. The same is true for all translations from Hilferding (1982b).
- 25 See Hilferding (1981 [1910], p. 182). See also pp. 136f., where Hilferding refers to Marx and 'that crafty banker Samuel Gurney'.
- 26 Cf. Niehans (1978, pp. 170–2).
- 27 See Schumpeter (1951a). Based on the first English edition of 1934. There are slight variations between the English and original German text of 1912.
- 28 See Schefold (1994e).
- 29 See Gottschalch (1962, p. 195).
- 30 See Gottschalch (1962, p. 192 and p. 199).
- 31 See Smaldone (1998).

Neoclassicals

William Stanley Jevons: the path to modern Utilitarianism

The Theory of Political Economy is without a doubt among the foremost classics of economics. For a long time Jevons, Menger, and Walras were considered the founders of Neoclassicism, an ostensibly sudden turn in economic theory which the English often refer to as the ‘Marginalist Revolution.’ This interpretation is challenged by the fact that Cournot and Gossen were certainly more than simple predecessors, since they arrived at discoveries comparable in importance with Jevons, Menger, and Walras. However, Cournot received but little attention, and Gossen as good as none. There was also a lengthy delay before the new perspective introduced by Jevons, Menger, and Walras was accepted, so that Niehans (1990, p. 163) writes, ‘The rise of marginalism may serve as a paradigm for non-revolutionary change in the history of science.’

Jevons, however, believed he was a revolutionary called to defeat Ricardianism, still prevalent in England, thanks to Mill’s influence. When he wrote his book, he was unaware of the work of Cournot and Gossen. Later, when he became familiar with their works, he admitted with admirable impartiality just how much he had been anticipated, though he remained conscious that in the English-speaking world, he had taken the important step toward the realization of the new thinking. Only in this way can the ambivalence in Marshall’s judgment of Jevons be understood. Marshall believed that he had come to similar results independently of Jevons – to that extent, he was not devoid of jealousy – but he also thought that Jevons had exaggerated the break with the past and had not given production costs their due. In the tradition of Smith and Ricardo, economics was concerned with the production, distribution, and consumption of wealth, which was itself understood substantively. Labour, adjusted by time, determined the value of a product distributed among the classes. In the Neoclassical theory of supply and demand, the parameters of distribution became factor prices; production, distribution, and consumption could, according to the standard viewpoint, be determined by the allocation of given resources through optimization.

The choice of production technique had long been related to profit maximization. In the third edition of his *Principles of Political Economy and Taxation*, Ricardo pointed out the connection between mechanization and distribution: The higher the wages, the greater the benefit from using machines to save labour costs. The novelty of Jevons’s approach, therefore, could only lie in his emphasis

on the rationality of consumer choice. The reference to use was indeed old: In Plato's *Protagoras*, we are already confronted with the idea of morals based on Utilitarian considerations, such that a judgment requires that utility be calculated, a conception from which the platonic Socrates distances himself. In *Philebos*, the elder Plato criticizes an unbridled hedonism which conceals the path to the Good. Likewise in Aristotle, the Good is of a higher order than the Useful (Schefold 1994a). It is possible to identify many early forms of utility theory, especially in the French authors of the eighteenth century. Bentham's Utilitarianism heavily influenced English philosophy, and the Ricardians were also closely connected with this tendency. Jevons explicitly sought to continue Bentham's calculation of pleasure and pain. He thus appears to be completing an older project with a new mathematical rigour, like Gossen before him.

Jevons seems at least subjectively to be a revolutionary because of the particular form of Ricardian value theory. Ricardo had explicitly rejected the idea that the concept of utility might determine demand; his logic was considered so compelling that up until Mill, who considered there to be nothing more to add to this doctrine of value, all notable teachers of economics in Britain followed the Ricardian approach. Jevons took a very different line when he began his book: 'Value depends entirely upon utility' (Jevons 1970 [1871], p. 77).

Much in Jevons's execution of the programme to determine value in terms of utility has since been criticized: when all costs are to be dissolved into a use-valuation, as seems to follow from the suggested principle, then the imputation of factors of production as proposed by Menger is lacking. Conversely, when labour costs finally materialize in Jevons's work, there is no clear definition of what Marshall called 'real costs.' In his discussion of the interdependence of markets, Jevons lags far behind Walras, and he did not deal with the problem of bilateral exchange with the acuity that Edgeworth would soon introduce.

There remains, however, the new awareness with which Jevons developed his principle and which lends his text a unique tension. This fascination is increased – for it is a book that has an attraction all its own – by a concise, apparently modern presentation not found in the complicated Walras, in Edgeworth's meandering citations, or in the somewhat old-fashioned Marshall. Jevons is guided by his interest in natural science, which he had employed in practical work as a meteorologist, as well as in his studies of physics. He was an important logician, whose philosophical texts were well received in lecture hall and classroom, and also gained scholarly recognition. Finally, he worked as an empirical researcher whose material was shot through with passionate resolution, who advanced daring theories such as the dependence of the trade cycle on sunspots, but who also put a lot of effort into the construction of price indices. He also carefully analysed at great length the important question of whether the purchasing power of gold had been altered by the discovery of new mines in Australia and California, bringing to this question a hitherto unknown precision. Jevons possesses an objectivity which amounts to more than his nonconformist upbringing. It unites a deep liberality with analytical depth, and in this way Jevons is akin to Ricardo, whose heritage he so resolutely challenged.

The ordering of Jevons to the developmental period of Neoclassical Theory raises few difficulties, and his book is relatively easy to read. After all, measured against the monumental works of the nineteenth century, it is relatively short. However, deeper characterization calls for empathy with an unusual person, an awareness of complicated scientific connections – here made more difficult by the multifaceted nature of his scientific interests – and an understanding of late Victorian society and its conceptual world, externally stable but internally so rich in contrasts.

Keynes's (1972 [1951], pp. 109–60) essay on Jevons, included in his *Essays in Biography* and motivated by the 1936 celebration of Jevons's hundredth birthday, can still be viewed as an inventive model for the history of theory, illustrating a person, a work, and historical background. There were also personal connections, since Keynes's father was examined by Jevons, and Jevons's son participated in the 1936 celebration and also commented on Keynes's address.

Keynes, who during his life was interested in genealogical questions, pointed out the importance of Jevons's father, a man active in the iron trade, who – a friend of Stephenson – is supposed to have built one of the first iron boats, and who had made a name as an author of shorter texts on economy and law. Jevons's mother – he was her ninth child – wrote poetry and her own father, William Roscoe, a banker, wrote biographies of Lorenzo de Medici and Leo X. The family championed the promotion of public welfare. They were Unitarians and thus belonged to the liberal middle class; dissenting from the English state church, they were therefore excluded from the Universities of Oxford and Cambridge, where an open allegiance to the Church of England was required. This sharpened their determination to distinguish themselves in cultural and humanitarian interests. Despite many setbacks, among them the death of his mother and the bankruptcy of the family business, Jevons managed to develop his broad talents, particularly in the natural sciences. He studied chemistry and mathematics in London but soon took a position in the treasury in Sydney and therefore spent the years from 1854 to 1859 in Australia. The foundation of his thought is supposed to have been laid here, although it was only after his return that he completed his formal studies. Keynes cites an early note from Jevons as characteristic of his Utilitarian thinking, where he explains that he could not imagine moral sentiments to be fundamentally separate from our instincts.

The first scientific work from Jevons on political economy, his *Brief Account of a General Mathematical Theory of Political Economy*, was presented at a meeting of the British Association in 1862, but this, similar to his related research on the purchasing power of gold, met with little response. His book *The Coal Question* (1965), conversely, brought him to national attention (Jevons 1965). A large printing, a mention from Mill in Parliament, and an invitation from the great Prime Minister Gladstone suggest the work's reception. Keynes believes the book is 'overstrained and exaggerated' (Keynes 1972 [1951], p. 112), but it is an excellently written text, which on every page handles dry material such as geology, extraction costs, and conditions of demand competently, in a masterly and fascinating fashion. Jevons's problem was not that of a worldwide shortage

of resources, but that of an over-hasty exhaustion of the national coal supply. He questions the sense of economic growth:

After all, commerce is but the means to an end – the diffusion of civilization and wealth. To allow commerce to expand until the source of civilization is exhausted is like killing the goose to get the golden egg. . . . Have we not hereditary possessions in our just laws, our free and nobly developed constitution, our rich literature and philosophy, incomparably above material wealth, and which we are beyond all things bound to maintain, improve and hand down to posterity?

(Jevons 1965, p. 455)

He then cited the Elizabethan era, a period which flourished due to a combination of good legislation, industrial progress, and entrepreneurship. Does the Victorian era not owe more to the expenditure of material energy than is commonly thought?

No part, no function of a nation is independent of the rest, and it is possible that in fearlessly following our instincts of rapid growth we may rear a fabric of varied civilization, we may develop talents and virtues, and propagate influences which could never have resulted from slow restrained growth however prolonged.

(Ibid., p. 456)

Great Britain has arrived at the pinnacle of its development, and there is now a simple alternative:

Our empire and race already comprise one-fifth of the world's population. . . . We stimulate the progress of mankind in a degree not to be measured. . . . But the maintenance of such a position is physically impossible. We have to make the momentous choice between brief but true greatness and longer continued mediocrity.

(Ibid., p. 459f.)

In fact, Great Britain's economic and political primacy was brief when measured against the example of the Roman Empire, with which the Victorians frequently identified themselves. However, it will hardly be suggested that coal represented the limit to growth, just as today, too, it is hardly the lack of material resources which represents the decisive limit to growth, either in ecological or in economic terms. However, the return of the arguments that Jevons had so eloquently argued, only indicating here his achievement in a few quotes, demonstrates that his Utilitarianism was neither one-dimensional nor materialistic; he also protested against such an equation in his *Theory of Political Economy*.

Jevons's achievements as a statistician and a logician are today treated as more important scientifically than *The Coal Question*. Keynes noted that Jevons's elementary treatment of logic has educated generations of students in Great Britain, India, and the colonies. He also wrote yet another work which can be categorized

as social policy, in which the state is made responsible for education. Keynes characterized Jevons as an introvert, who when lecturing felt as if he were in the stocks, brilliant in his youth but weaker in later years. He died in 1882, a year before Marx, who was unaware of him. In less than three decades of scientific activity, he had created an extensive body of work, in which *The Theory of Political Economy* stands out for Keynes (1972 [1951], p. 131) as ‘the first modern book on economics’.

Jevons could have introduced his new ideas in a general economics textbook, beginning with questions which would have had little to do with differences between Classical and Neoclassical approaches. He began, however, *in medias res*, with the statement that value was completely dependent upon use. Labour is only an apparent source of value: ‘Labour is found often to determine value, but only in an indirect manner, by varying the degree of utility of the commodity through an increase or limitation of the supply’ (Jevons 1970 [1871], p. 77).

He defines the science of economics in a new manner when he claims that it must be mathematical, based primarily on data, but it was no problem that utility was not measurable. Other quantitative measures, such the concept of probability, for electricity or for heat, had also once lacked a precise metric. He is insistent that the Utilitarian principle properly turns on the following principle: whatever increases the happiness of humanity is just and good. He does also give higher duties their due, beginning with those owed to the family: but ‘It is the lowest rank of feelings which we here treat’ (*ibid.*, p. 93).

And he cites Bacon: ‘while philosophers are disputing whether virtue or pleasure be the proper aims of life, do you provide yourself with the instruments of either’ (*ibid.*, p. 93). Jevons thus suggests that his Utilitarianism comes up against limits which are of an empirical, as well as a momentous philosophical nature, because there is no explanation of how the priority of a Utilitarian morality is limited by a system of obligations. This ambivalence is noticeable in modern theory when the implications of calculations of optimization clash with ethical considerations. Having made his reservation, Jevons quite self-confidently assumes a position which, by virtue of the priority granted to the calculation of utility, has been proved to be analytically extraordinarily fruitful. Legitimated by the fairness of the exchange relationship and the efficiency with which commodities are made available, it remains agnostic in respect of the manner in which the higher-order social, familial, or religious demands might be realized. In this way, the Smithian concept of self-interest underwent both a decisive amplification and a narrowing.

I would now like to identify several trains of thought in Jevons’s book which seem to me to be particularly characteristic of his historical turn to a mathematized calculation of utility. For the formal presentation of his theory of exchange, I would refer to the two entries from R. D. Collison Black (1987) and T. Peach (1987) on Jevons in the *New Palgrave Dictionary of Economics*.

Jevons’s treatment of the balance of exchange, of labour, rent, and capital, does not seem today very elegant, however original it once was. It is not difficult for a reader trained in modern microeconomics to retranslate them. But Jevons foresaw future scientific developments and precisely established their basic ideas. He left the weighing of motive to individuals but promoted a science of economics based upon statistics:

I know not when we shall have a perfect system of statistics, but the want of it is the only insuperable obstacle in the way of making economics an exact science. In the absence of complete statistics, the science will not be less mathematical, though it will be immensely less useful.

(Jevons 1970 [1871], p. 84)

Besides this empiricism, he values historical research no less but demands that it be pursued separately, since in economic theory deduction takes precedence. His explicit recourse to the feelings of pleasure and pain which underlie utility calculus has indeed been superseded. From references to some predecessors, Jevons himself already sees this relationship from the perspective of doctrinal history.

The concept of value which he established begins with the commodity. A ton of raw iron is not worth an ounce of gold, but instead the value of an ounce of gold and the value of a ton of iron are the same. This formulation is in direct contrast to the Marxist understanding of value forms, from which Marx developed his doctrine of commodity fetishism and his theory of money. There is no reason to think, however, that Jevons knew Marx's 1859 text *A Contribution to the Critique of Political Economy*.

Proceeding through exchange equivalents, Jevons sketches a diagram of supply and demand which admittedly is not as clear as Rau's diagram, already published in 1841 (printed in Ott and Winkel 1985, pp. 134–6). Here the status of the exchange equivalent remains obscure, so long as the competitive context is not clarified.¹ But as Jevons himself remarked, the advance lies in the fact that supply and demand are part of a quantified equation, and this is not merely an analogy, unlike the classical conception of supply and demand. Jevons compares his exchange theory with the mechanics of levers, suggesting that the marginalist perspective of economists can be equated with the virtual velocities used by physicists. Such close analogies today fail to evoke the didactic interest that Jevons accorded it; however, it remains an interesting proof of how mechanical functions provided a model for the economy.

Jevons then moves to the marginal utility of money, remarking that marginal utility is higher for a poor family than for a rich one, without, however, sensing the importance that this idea would later have.

The treatment of the demand curve gives rise to a nice turn in the history of economic thought. Jevons remembers the contribution made by 'Political Arithmetick' in understanding the dependence of demand on prices and especially Gregory King's famous rule, which was forgotten by the classical economists. Ricardo, in dealing with long-run positions, took the level of demand as a datum. Jevons explores only the short period, hence in Ricardian terms the question related to the formation of market prices, where decreases in harvests lead to increases in farmers' incomes. He implicitly uses here a total revenue curve; working out the concept of marginal revenue itself is not then a very big step.

With a somewhat superficial critique of the tradition of the labour theory of value, he moves to his chapter on the theory of labour, which is very much of its time. His concept of labour is remarkably naturalistic. Work is measured by the

intensity and duration of exertion. As a subjectivist, Jevons may not have been tempted, as was Marx, to objectify effort by using quasi-medical measurements, but he did get involved in the empirical side of the question in considering how the performance of a job can be optimized not only theoretically but also practically by suitable experimental instructions.² In dealing with the question of how the demand for the product of labour is to be weighed against the labour effort that went into it, Jevons stumbles upon the possibility that with increased wages, the amount of work supplied falls; however, he draws no backward-bending labour supply curve, whose explicit treatment we connect with Launhardt's name. The equations which he then constructs for the allocation of labour between two different occupations are simply confirmed by a Lagrangean approach.

Not every reader might know that Jevons's remarks on joint production have had a particular influence on the course of theoretical history. In various passages he remarks that products not only generate positive utility, but that they can also cause damage, that joint products with deleterious effects for the environment have to be eliminated at a cost, and that joint products which cause no noticeable damage but are produced in surplus should be treated as free goods. These ideas are today part and parcel of microeconomic thought, but given Jevons's interest in his former specialty, chemistry, and the rapid development of the chemical industry in the second half of the nineteenth century, such ideas must have been quite obvious to him.

But he impressed his contemporaries with another aspect of the problem. Utility theory can easily assign relative values to two joint products arising from one and the same process, whereas the labour theory of value seems to possess no criterion through which it can impute production costs. Mill admitted, in a passage cited by Jevons (1970 [1871], p. 208), that in joint production a principle prior to value theory, the law of supply and demand, must be introduced. Joint production was not, however, an exception, Jevons maintained triumphantly, and the law of supply and demand must be generally applied; he viewed production costs as only one aspect of the determination of prices from supply and demand. And although he did not yet know of the term 'transformation curve,' Jevons thereby advanced towards an elementary derivation of the relative price of two joint products.

In the modern development of Classical Theory, which had long ago left behind the labour theory of value, it is now demonstrated that natural prices emerging in the long run can be calculated even with joint production from the structure of production at given levels of production, since from the maximization of profit alone it already follows that in a linear system, exactly as many processes will be set in motion as there are products valued at positive prices; for the determination of prices, therefore, there are just as many equations available as unknown prices. When this solution to modern Classical Theory was being discussed, nearly one hundred years had passed since Jevons's challenge to the older Classical Theory.³

Jevons also briefly explores overproduction in the chapter on labour. Without any detailed evidence, he argues that general overproduction is impossible: 'The doctrine is evidently absurd and self-contradictory' (Jevons 1970 [1871], p. 212).

Things are only this simple for someone who considers the logic of his own system to be unassailable. Jevons does not deny partial overproduction but instead interprets it as a misallocation of labour.

The following chapters on land, rent, and capital are also of interest to the history of theory. Jevons himself says that his theory of labour supply is really the same as that of land in rent theory. Although the formation of factor prices does not come out clearly and there is no real explanation of how Jevons conceives the determination of the wage rate, in particular, his explanation of differential rent is transparent because it is so closely related to the Ricardian tradition. Jevons refers back to James Anderson and James Mill, whose clear and concise style of presentation he particularly admires. He formulates the law of the balance of marginal returns and provides a visual illustration for the emergence of rent.

One is surprised to learn that Jevons's views on capital are in 'fundamental agreement with those adopted by Ricardo' (*ibid.*, p. 225). Certainly, capital is also a produced means of production for Jevons, although, on one hand, the capital stock is to be measured according to investment costs and, on the other hand, according to the length of time it remains tied up in the production process. When new capital goods replace the old, exhausted ones, the average age of the capital stock in a stationary system is half the expected length of life of a new capital good. This conception suggests Austrian capital theory, which measures the capital stock by previously completed work and roundabout production, in order to be able to counterpose to the supply of capital supply the demand for capital, from which then the interest rate is determined. In the measurement of capital, even including a time element, one might detect an echo of Ricardo, but the approach is a very different one, due to the very different character of the respective theories of profit. Jevons's son therefore saw his father in a direct line between Bentham and Austrian theory and wished to classify Mill and Marshall in a different theoretical line.⁴ The formal elaboration here is faulty and cannot be so easily reconstructed. However, a principle statement of Neoclassical capital theory, according to which capital accumulation reduces the scarcity of capital and thus leads to a sinking of the interest rate, is clearly established.

Finally, there is an attempt to formulate a macroeconomic theory of distribution. Jevons here unfairly accuses Ricardo of having set up only one equation for two unknowns (the entire income divided into wages and profits). For Ricardo, the real wage rate is instead determined by subsistence needs; profit is the residual determined by the amount of surplus, which in turn is dependent upon technology and the level of accumulation. The wage fund, if we want to use this expression for the capital available for the employment of labour in connection with Ricardo, also indicates how many workers can be employed at a given wage rate. Since Jevons only repeats the Classical Theory of distribution in a watered-down form, understanding his own theory is made more difficult. Scarcity prices regulate the markets for capital and for various specialized forms of labour, once competition has eliminated preliminary profits by price reductions which benefit consumers. However, a precise determination of the income shares is lacking, since Jevons has still not formulated a production function and does not clearly

express himself on the adoption of full employment, which forms the basis of pre-Keynesian marginal productivity theory.

Jevons, who began with such a keen awareness of the novelty of his theories, had difficulties in accepting the gradual discovery of predecessors. He did, however, include in the second edition a lengthy introduction tracing the history of theory and also added two appendices, among which was 'A List of Mathematico-Economic-Writings.' Friends and correspondents, among them Walras, supported Jevons in his major project to establish for the first time an overview of the development of mathematical-economic theory. The modern conception of the history of economic theory is still influenced by his efforts, and the list, later expanded by Irving Fisher, remains an important bibliography.

For Jevons, the deciding result was that the mathematical approach to economics proved surprisingly to be just as old as the scientific treatment of economics itself.⁵ It is astonishing how much Jevons found out about the Italians and the French. He discusses, of course, Canard, Whewell, and Bentham, and he names Condillac as the first to approach utility theory mathematically. He mentions Dupuit, he is aware of Cournot's great importance (though Cournot avoided employing the term 'utility'), and he praises Gossen in particular, admitting that it is his 'fundamental theory . . . even more general and thorough than I was able to scheme out' (Jevons 1970 [1871], p. 62). Up to this time, all of these works had remained unknown to the economists of the Ricardo school.

Jevons then comes to Walras, father and son, to von Thünen, and turns once more, finally, to a critique of the Ricardo School. Storch is praised as a simultaneous discoverer of the parallel nature of the determination of wages and rents. Finally, he arrives at the famous comparison:

When at length a true system of economics comes to be established, it will be seen that that able but wrong-headed man, David Ricardo, shunted the car of economic science on to a wrong line – a line, however, on which it was further urged towards confusion by his equally able and wrong-headed admirer John Stuart Mill.

(Ibid., p. 72)

Whether that interpretation is correct is still a source of controversy. Jevons's book would still have been a classic, even if he had never mentioned his predecessors. He grows in our estimation all the more for his readiness to relativize his own achievement.

Francis Ysidro Edgeworth's *Mathematical Psychics*

A century after *Mathematical Psychics*, Edgeworth's theory of exchange still has not fully realized its potential as seen by its admirers.

(Niehans 1990, p. 286)

We turn here to a very unusual work, unusual in content, character, and importance. Although famous and scientifically influential, internationally renowned

and well versed in the European literature of his time as no other English economist, Edgeworth was considered something of a crank by his fellow economists; he himself deferred to Marshall's authority.⁶ His late works – mostly essays and many lectures – touched on the most varied sub-fields of economics and also especially statistics. These works would today be known only to specialists if his early key work, *Mathematical Psychics*, had not had such a unique fascination.

The clear and elegant aphoristic formulations which Edgeworth found again and again could make undiscerning readers think that this was a rather light work. However, difficult mathematical passages and obscure conceptual constructions, together with an underlying argument that was, however, not fully elaborated, make it a difficult book to read, especially at the beginning. The book was therefore treated with scepticism, until some one hundred years after its first appearance, economic theorists appreciated the depth of Edgeworth's thought and found there the germs of ideas that would provide modern equilibrium theory with a new conceptual foundation for the ideas of perfect and imperfect competition via the idea of the 'core'. Game theory, the Theory of Contracts, and industrial economics, all of which are today at the centre of theoretical work, owe a great deal to Edgeworth.

It is possible to piece together an idea of where he thought his approach belonged historically from his own writings. In 'Exchange, Value in,' one of his many contributions to the original *Palgrave Dictionary* (Edgeworth 1894a, p. 759), he begins with the traditional explanation of relative prices. The effect of competition is minimal if two merchants who both want to exchange their goods directly face each other or, alternatively, '... bodies of persons actuated by one will, e.g. two governments negotiating a commercial treaty, or a trade union coming to an agreement with a combination of masters about the rate of wages' (ibid.).⁷

It is actually the treatment of two-sided pure exchange which Edgeworth made famous, by showing in *Mathematical Psychics* that in this case the contracting parties in general will find a continuum of potential allocations along a contract curve which represents all Pareto-optimal conditions. 'This simple case brings clearly into view the characteristic evil of indeterminate contract, *deadlock*, undecidable opposition of interests ...' (Edgeworth 1881, p. 29). Isolated exchange, with which the modern textbook introduces the so-called Edgeworth Box – the concept was first presented in its modern form by Pareto – was thus seen by Edgeworth as a potential conflict, as we tend to represent it today in the case of a bilateral monopoly. The indeterminacy of the solution provided the incentive for authors such as Stackelberg to speak of a 'lack of equilibrium' and the necessity for governmental intervention to create accord.⁸

In his *Palgrave* entry, Edgeworth (1894a) could have explained the implications of his argument in *Mathematical Psychics*; how an increase in the number of agents of the same kind narrows the scope for indeterminacy and that under perfect competition, the 'core' coincides with equilibrium. Instead, he opted for a simple overview of the history of explanations relating to relative prices. He never succeeded in developing his novel speculations in *Mathematical Psychics* into an independent theoretical construct. He therefore essentially adapted himself into

the 'mainstream' that Marshall developed. In the previously mentioned entry in *Palgrave*, he briefly summarized what was known of monopolies (with reference to Cournot) and covered the topic of competition in detail, which he then conventionally classified according to whether the relative prices could be explained by production costs or not.

Production costs will not explain prices when the prices under consideration are for goods which are not reproducible. In case of reproducibility, similar to Marshall he makes the relationship between the 'two factors of value, utility and disutility' (*ibid.*, p. 761), central, and this symmetry is the expression of his reservations with regard to a complete dissolution of the classic concept of 'costs' into opportunity costs. He even maintained this position against Böhm-Bawerk. 'I speak on behalf of those who hold, in opposition to the Austrian School, that there is not one ultimate standard, but two ultimate standards: utility and disutility' (Edgeworth 1925, vol. 3, pp. 59–60). Thus, Edgeworth is, on one hand, the discoverer of some of the most revolutionary ideas of Neoclassical Theory, and yet, on the other hand, remained bound to the basic theories of Classicism and the older Utilitarianism, theories which elsewhere were beginning to be abandoned.

In his biographical essay on Edgeworth, as a literary composition one of the best pieces he ever wrote, Keynes summarizes Edgeworth's ambiguous nature:

All his intellectual life through he felt his foundations slipping away from under him. What wonder that with these hesitations added to his cautious, critical, sceptical, diffident nature the erection of a large and heavy superstructure did not appeal to him. Edgeworth knew that he was skating on thin ice; and as life went on his loving of skating and his distrust of ice increased, by a malicious fate, *pari passu*.

(Keynes 1972 [1951], pp. 262–3)⁹

There is a sense of uncertainty, even in *Mathematical Psychics*, associated with Edgeworth's somewhat elitist conception of Utilitarianism, an intellectual elitism whose ultimately eugenicist implications he did, however, consider ethically suspect.

The utility of society increased with those capable of significant sensibility and hence with their number. This contrasts with the familiar egalitarian argument: if the utility functions of the rich and the poor are comparable, the redistribution of wealth from the rich to the poor makes sense, as long as it may be assumed that the marginal utility of the former, because of their greater level of consumption, is lower than that of the latter. Only the transition to Pareto's ordinal theory ended such speculation for the time being.

Yet another disturbing feature is inherent to *Mathematical Psychics*: Specifically, whether the uncertainty of a contract in imperfect competition, starting with isolated exchange between two contracting parties, might not necessarily lead to conflict. In this regard, Creedy points out that since Edgeworth recognizes the uncertainty of the bilateral exchange problem on a contract curve, he makes it a principle of his conception of the theory of distribution that the partners must be unsure about the outcome of a distributional negotiation, so that it is worth their

showing themselves prepared to compromise and seek the best solution as defined in a Utilitarian sense. The solution maximizes the common utility (more precisely, the sum of utilities) and is similar to the solution of collusion, which maximizes the sum of profits in a duopoly. Creedy's (1986, pp. 82–3) interpretation moves Edgeworth close to Rawls. How close Edgeworth is to contract theory is shown by a citation from one of Edgeworth's texts on taxation:

... each party may reflect that, in the long run of various cases ... of all the principles of distribution which would afford him now a greater, now a smaller proportion of the sum-total utility obtainable ... the principle that the collective utility should be on each occasion a maximum is most likely to afford the greatest utility in the long run to him individually.

(Ibid., p. 83)

It can be shown that a social welfare function will be chosen – if each utility-maximizing individual does not know a priori what the final allocation will turn out like – which maximizes the sum of all individuals expected utilities (ibid.).

These few suggestions should suffice to demonstrate Edgeworth's relevance for today. Where in the economics literature of the nineteenth century is there a comparable example of such productive consequences for modern theory and such momentous rediscoveries? Where else can we still gain so many constructive ideas from an author's doubts about the acceptability of his or her considerations? The reader will find enough information in the fast-growing history of economic thought literature, as well as statements which verify how modern theory uses Edgeworth as a reference.¹⁰

Just as the theoretical development of Edgeworth's ideas is not finished, there are also unresolved issues from the point of view of the history of economic thought. In particular, too little is known about the intellectual development of the young Edgeworth. It would be nice to know more about the internal connection of the scientific problems he pursued, beginning with a more serious consideration of his literary and philosophical interests than has thus far been devoted to them. Finally, I wonder whether the rather disparaging judgment of Edgeworth's late work, handed down by Keynes and others, is still valid today.¹¹

Eugen von Böhm-Bawerk: discovery and error in the history of theories of interest

Bibliographic investigation of the history of economics can bring thousands of works to light, among which, however, only a few have become classics (Howey 1982). At the beginning, there were the retrospective assessments of theorists – for instance, Aristotle – who sought to distance themselves from their predecessors. There then followed the encyclopaedic collection and review of material. In the second half of the nineteenth century, systematic classification began, dividing theorists by region and era. Wilhelm Roscher's *Geschichte der National-Oekonomik in Deutschland* [A History of Political Economy in Germany] (1992 [1874]) is

one such example. Roscher was convinced that he could establish certain shared ideas and constants in German economic doctrine. A more systematic approach, providing greater differentiation between political orientations, is found in Eugen Düring's *Kritische Geschichte der Nationalökonomie und des Socialismus von ihren Anfängen bis zur Gegenwart* [A Critical History of Political Economy and Socialism from Their Beginnings to the Present] (1900). One of the goals of this quite polemical book is to criticize socialist ideas and their prehistory.

By contrast, in 1893, two English works on the history of economic doctrine appeared which started from fundamentally different ideas of systematization. James Bonar, in *Philosophy and Political Economy in Some of Their Historical Relations* (1967), provided an overview, still worth reading today, of the connections between economy and philosophy, at the centre of which stand the great philosophical texts of the ancient world and Idealism, which directly or indirectly address the relationship between economy and society. There is a clear effort to provide a thoughtful response to Socialism: because of its materialist foundation, it had made a strong claim to have solved basic philosophical problems by searching for the economic 'basis.' In the same year, Edwin Cannan's *A History of the Theory of Production and Distribution in English Political Economy from 1776 to 1848* (1967 [1898]) appeared. He looked back from the context of the rise of English Marginalism to the classical period, between Smith and John Stuart Mill. Of all of the books thus far mentioned, Cannan's is the most consistently organized according to theoretical concepts. It inquires into common ideas about production and division of labour during this period, about the relative development of wages, profits, and rent, as well as their distribution. From a modern perspective, one would say that Cannan no longer understood some of the basic ideas of Classical Theory and, like Marshall, tended to combine viewpoints.

Dmitriev's approach, which based his own theoretical work on the history of theory, was quite ingenious (Schefold 1992a). He was the first to provide a consistent formalization of the Ricardian system, although Dmitriev himself increasingly leaned toward the Marginal Utility School. Karl Marx, who made numerous comments about the history of monetary theory in his *Zur Kritik der Politischen Ökonomie* [A Contribution to the Critique of Political Economy] (1970 [1859]) published in 1859, wrote in the early 1860s a history of doctrines regarding the connection of value, growth, and distribution in his *Theorien über Mehrwert* [Theories of Surplus Value], later revised by Karl Kautsky and published between 1905 and 1910.¹² Marx limited and interpreted historical material strictly in terms of his own ideas. Despite its analytical style, the most important history of theory in the twentieth century, Schumpeter's *History of Economic Analysis* (1954), offers a comparatively encyclopaedic approach, which shares some of the objectives of the Historical School.

There is no doubt that Eugen von Böhm-Bawerk's *Geschichte und Kritik der Kapitalzins-Theorien* [History and Critique of Theories of Interest: Volume 1, Capital and Interest] can be defined as a work in the history of economic thought, and it can also be described in terms of a double-negative: It presents neither a general history of economic doctrines nor an explanation of the emergence of theory from

personal inclinations and historical context; biographical and historical comments are scattered throughout the work and remain marginal. Instead, a single theoretical question is put to the works of the past: How do they explain interest?

The majority of older authors did not have a precise concept of capital founded upon value theory, deriving from that income on capital. Böhm-Bawerk and Fisher have taught us to interpret interest as an expression of relative price in an intertemporal exchange. Arrow and Debreu's general equilibrium develops this idea in terms of an interdependent system. But how was interest actually understood in the past? As long as goods were not dated, no one could speak of an intertemporal exchange. What could interest be, if not a price in an exchange of that sort? For us, the puzzle is greater than it was for Böhm-Bawerk, who as a student became thoroughly immersed in doctrines so that he might transcend them, while we have a great deal of difficulty imagining a world without dated goods, so that we might better understand the history of interest theory.

In 1876, Böhm-Bawerk presented a youthful paper on the interest on capital in a Heidelberg seminar led by Karl Knies; this presented a retrospective on the history of economic thought which already contained the core ideas of his later theoretical system.¹³ During his lectures in Innsbruck in 1881 and 1882, Böhm-Bawerk still taught the old interest theory (Tomo 1987). He was apparently convinced that his perspectives drawn from the history of economic thought were revolutionary, and he almost entirely withheld his secret, even in his history of interest theories, so as to create a sensation of suspense among his readers. The stratagem worked, and the publication of his *Positive Theorie* [Positive Theory] unleashed an international controversy.

As many commentaries show, Böhm-Bawerk did not explain to the satisfaction of modern doctrinal historians the superseded view of the fundamental nature of interest and the causal relationships leading to its quantitative determination. However, his work is still unique in the rigour and consistency with which he questions the principles behind the sometimes rudimentary efforts of his predecessors. His constructions which he places upon them have since been challenged. But I find the intensity of his effort exemplary, especially if we pardon a certain intransigence with which he defended the ingenious first edition, with additions in later editions, as well as in polemical essays. He dared to challenge the guild:

They were all, whatever their viewpoint, faced with an incisive critique of their own doctrine after the publication of the first volume of Böhm-Bawerk's book; hence before they even knew the author's solution to the problem. The suspense with which the publication of Böhm-Bawerk's positive theory of capital interest was awaited was quite as comprehensible in these conditions as the flood of attacks which poured down on the head of that clever innovator following publication of the book.

(Menger 1970, p. 306, my transl.)

Böhm-Bawerk's stance was the antithesis of that adopted by Marshall, who appeared much more conciliatory, at least superficially. Even in the transition from the Ricardian system to his own theory, Marshall suggested that he found

more continuity than discontinuity. Böhm-Bawerk exclaimed that Marshall really should at least admit that Menger's utility theory, Senior's abstinence theory, and the labour theories of French and German writers, were

... essentially different ... although they have all assumed both a degree of prospectiveness [orig.] in their arguments as well as the greater yield from capitalist production in some form – just like my own interest theory takes up and evaluates both moments.

(Böhm-Bawerk 1957)

Böhm-Bawerk dug a little deeper: Were the preconditions thought necessary for these theories perhaps the explanation? Real explanation started only where common assumptions ceased.

Where does 'effortless capital income' come from? The objection might be raised that not all capitalists share the same degree of 'effortlessness' and freedom from risk. Independent entrepreneurs in industrial enterprises who expanded their businesses by taking out loans have to divide the accrued profits with their lenders, though the chain can be extended, owing to the intervention of bankers and other agents. Böhm-Bawerk believed that for his central problem, he could abstract from business profit, and most modern theorists still agree with this today. 'Without prejudice to our investigation' he wanted to leave it open 'whether so-called entrepreneurial profit is a profit from capital or not' (*ibid.*, p. 10). As we will see, for some writers it is just this division of profits into interest and the entrepreneurial share which plays a determining role.

Böhm-Bawerk actually has very little to say about the ancient world. In the last years of the Medieval era, the debate becomes serious:

The old pagan Philosophers could make free with their denunciations without much in the way of causal argument because they were neither inclined nor able to lend them practical effect ... But now the matter had again become practical. First it was necessary to be of assistance in establishing the Word of God on earth, and once this had been done then the justice of new laws had to be defended against the hostility that immediately ensued.

(*Ibid.*, p. 19)

Only interest on loans met with resistance. Because money is recognized as a pure means of exchange – and thus the sum lent is considered unproductive – then individuals charging interest act extortionately if they receive proceeds which are not due to them or if, according to Thomas, they even sell 'time', which in fact belongs to everybody. In contrast, loaning durable goods, called leasing, is not condemned because the yield drawn from such goods has a visible connection with the object lent and must therefore pass to the lender, as long as the lender does not have to pass on a share to leaseholders for effort and supervision.

Productivity theories appear to be the simplest of the three large groups of theories which Böhm-Bawerk distinguishes: they ascribe to capital the capacity

for producing an added value, whether directly or mediated by a conception of the theory of value. Böhm-Bawerk's counterargument is well known: Where capital goods in the broadest sense permit such an added value to be produced, they will increase in value themselves. When, for example, with a certain amount of seeds newly discovered fertile lands permit the attainment of a higher yield than before, this additional profit will be translated into the rent of the newly discovered land.

This idea already underlies a reversal of Turgot's conception, which Böhm-Bawerk calls 'fructification theory': If – for the Physiocrats – land tends to yield profits at a certain rate, then other enterprises in other lines of business must also be allowed to obtain this rate, among them capital investments, so that loan interest can be explained (in modern terms) as the opportunity costs resulting from waiving an investment in agriculture. Differential rates of profit, varying according to the amount of risk assumed, are already mentioned by Turgot. Böhm-Bawerk's critique of productivity theory can then be briefly reformulated as follows: The rate of return in agriculture which is supposed to determine the rate of interest is the quotient of the agricultural rent and the land price as the capital value of the land. In terms of economic causality, we have to interpret the land price as the capitalization of rent, but to determine this, we must already know the interest rate. In the context described by Böhm-Bawerk, it cannot be explained but has to be given. It would be different if the agricultural rate of return were defined along classic Physiocratic lines as the relationship between the net rate of return on grain and grain expenditures, independent of price. Böhm-Bawerk does not, however, appear to have been aware of the Ricardian corn model, which would have forced him to rethink his argument. Yet another way to salvage Turgot's approach would be to relocate it in general equilibrium theory. As we will soon see, Walras attempts a simultaneous determination of the prices of land and producible capital goods, based on services and the interest rate.

And so utilization theory was therefore invented: the yield from capital costs more than the value of the means of production, because a separate use is attributed to the capital. Each use of capital becomes an economic commodity which must be made available in sufficient quantity, and interest is the price to be paid for this use. Böhm-Bawerk objects, however, that the item lent and its use cannot be clearly separated economically. In order to follow Böhm-Bawerk's immanent critique, we would need to devote some time to understanding his refutation of the arguments of many authors whose lineage goes all the way back to the Middle Ages. Since we are employing a modern methodology, we can, however, simplify this critique and say that it is the uses which initially define the economic nature of capital assets to be lent. One rent is fixed for an apartment offered as a place to live and another when it is to be used as an office, but there is no rent for the apartment as such. Depending on the types of use allowed during the period of availability, for each type of permissible use, the apartment represents a different good. Consequently, the potential uses connected with the lending of a capital asset finally define it as an economic object.

Now, certain rents represent the price for particular uses of apartments for rent. Since at the end of the rental relationship, the apartment has to be returned,

the fee paid appears to be only for the use of the apartment. It appears that the price, furthermore, can be compared to the construction costs for the apartment; the quotient would be the desired rate of return or the interest on this 'apartment capital.' Böhm-Bawerk objects, however, that the apartment itself has changed, due to wear and tear and the alteration of the surroundings. The loaning of monetary capital is no different: It will be paid back, so the interest is understood as the price for its use, and the rate of interest appears clearly defined; however, Böhm-Bawerk's analogous counter-argument is that due to a change in relative prices, the purchasing power of monetary capital might be different once the money is returned. To what, therefore, would interest relate? Thus, for Böhm-Bawerk, utilization theory is refuted, and he offers an alternative theoretical construction: Loans are understood as an exchange of present goods for future goods. This new paradigm, which has guided economic thought ever since, is merely suggested here by Böhm-Bawerk (*ibid.*, p. 259); his 'agio theory' is completely described only in the second volume of his *Kapital und Kapitalzins* [Capital and Interest].

Modern economics readers often object to what they see to be the dreary legal language in Böhm-Bawerk's critique; however, historians have to acknowledge that well into the eighteenth century, the debate was largely conducted by lawyers, and that legal concepts remained influential. With respect to loans, the Canonists see 'the total transfer of the sum loaned, in a legal as well as an economic sense, to the ownership of the debtor against repayment on his part of a simultaneous equivalent' (Böhm-Bawerk in Yagi 1983, p. 25, my transl.) – therefore the creditor had no right to charge interest. Opponents believed creditors only wanted to sell the temporary use of a loan – and for this, they wished to charge interest. Their difficulty was, however, that debtors were not only legally regarded as temporary owners, but that they could also consume the transferred goods, as long as they returned other goods on the date payment was due, so that it was a fiction for the creditors to declare they could keep the borrowed materials. In the early paper by Böhm-Bawerk mentioned previously, he referred to the Roman institution of *quasi-usus fructus*, which created a particular legal relationship for a kind of simultaneous legal claim to the same object on the part of creditors and debtors (*ibid.*, p. 26). However, the legal separability of capital and use was, for Böhm-Bawerk, still not established by a legal construction of that sort; he concluded his 1876 seminar paper as follows: 'Lending consists in the furnishing of a sum of present goods for a sum of similar goods' (*ibid.*, p. 32, my transl.), and he had thus already arrived at the starting point of his later theory.

Carl Menger, in contrast, held fast to the notion of utilization and wrote to Böhm-Bawerk:

As far as concerns the scientific problem you are working on, however I believe that gainful opportunities [Menger's term for utilization, BS] are not goods in a physiological-technical sense; certainly, however, they are – to the extent exclusively 'available' – according to experience independent transactional objects and thus independent economic objects.¹⁴

To what degree the intentions of utilization theorists – and Menger, in particular, with his emphasis on uncertainty – are treated fairly remains an open question; however, one might expect of the model the statement of preconditions which actually permit a formal definition of the concept of utilisation. In an economy growing at a steady state without progress, we consider purchasing power to be constant. The equivalent to be returned for a cash loan is thus defined. When capital assets are lent, borrowers may be expected to know the real costs for maintaining the quality of the capital asset, and the depreciation, assessed at the conclusion of the loan period, can be derived from that; net interest can then be calculated and corresponds to net utilization, which is thus defined as an economic object and assessed. The interest rate becomes the quotient of interest and a calculable capital value. The measurement of use can be determined, in this case, according to either Classical or Neoclassical principles. Remarkably, Böhm-Bawerk comes close, in his own theory, to the preconditions hypothesized here, to the extent that at equilibrium, he assumes a uniform profit rate and thus the uniformity of own rates of interest.¹⁵

Böhm-Bawerk identifies Walras as a prominent representative of utilization theory: ‘Walras views return on investment as compensation for the ‘*service producteur*’ of capital, which is a particularly immaterial good’ (Böhm-Bawerk 1961, vol. 1, p. 465, my transl.).

In a chapter of Walras’s *Pure Economics* entitled ‘*Equations de la capitalization et du crédit*’ (Walras 1998 [1874], pp. 285 sqs.), the price p_k of a capital asset is determined, on one hand, by production costs; on the other hand, the capital asset provides a service for price p_k . Walras postulates a specific amortization μ_k and risk ν_k for the capital asset such that the net proceeds amount to $p_k - (\mu_k + \nu_k)$. Its capitalization at the general rate of interest i must yield the value of the capital asset as follows (ibid., p. 289):

$$iP_k = p_k - (\mu_k + \nu_k).^{16}$$

Walras wants to show that the number of equations and unknowns in his system, even including capital goods production and the determination of interest, is the same. Modern analysis demonstrates that the existence of equilibrium – with certain restrictions – can be proven. The formalization of utilization theory illustrates one of the difficulties indicated by Böhm-Bawerk: Amortization (or its rate) is prescribed as a particular value, not calculated. This deficiency can be compensated when fixed capital, following Sraffa’s model, is understood as a joint product, in order to derive the amortization from physical data. The other difficulty is to demonstrate that despite the heterogeneity of uses, a uniform profit rate or return on investment can emerge; a more recent critique suggests that Walras is inconsistent, insofar as he requires at the same time a uniform return on investment in capital goods’ production and allows arbitrary initial endowment of capital goods (Eatwell 1987). We are not going to enter into the controversy here, because Böhm-Bawerk’s analytical capacity is not up to dealing with a mathematically formulated general equilibrium theory. Nevertheless, his understanding of the

necessity of dating goods and prices has been accepted by the professions, while Walras's utilization theory still plays only a subordinate role.

The critique of abstinence theory, as articulated by Nassau Senior, is omitted here because its plausibility was always minimal: 'The hard-earned sovereign which the domestic servant puts in the savings bank bears, absolutely and relatively, less interest than the easily spared thousands which the millionaire places in debenture and mortgage funds' (Böhm-Bawerk 1957, p. 277).

Finally, the critique of exploitation theory is in many respects a critique of its main assumption, the labour theory of value. Since the third volume of *Capital* had not yet been published, Böhm-Bawerk's most important comments on Marx's theories were only made later. In contrast, predecessors such as Hodgskin and Rodbertus, seldom read today, play an important role for him.

In his 'Conclusion', Böhm-Bawerk speaks of three 'distinct fundamental conceptions of the whole problem' (ibid., p. 421). He compares the naïve productivity theories to a river formed from three different sources. They correspond to capital, labour, and land as factors of production. At the mouth of the river, the stream divides again into three parts, representing the incomes of the owners in proportion to the inflows from the sources. He compares exploitation theory to a river with one source (labour), which first divides at the mouth of the river. For Böhm-Bawerk, both are flawed from the start, since neither takes account of the interdependence between source and mouth, between service performed and distribution. Utilization theory, which was advocated by his teacher Menger, represents the real challenge for Böhm-Bawerk. A continuation of our discussion appears to show, however, that *agio* theory and utilization theory are not essentially different in stationary cases.

Since Böhm-Bawerk's interpretation of interest relationships as an intertemporal exchange set the terms for today's Neoclassical economists, we need to ask once again what other ideas about interest we can find in the classical era, placing Böhm-Bawerk's interpretations to one side for the moment and instead using a modern formalization to explain the structure of Classical Theory. From this, we will gain a broader perspective for the evaluation of Böhm-Bawerk's historical achievement as a theorist.

According to one interpretation, which is naturally not without controversy, the methodology of the Classical economists, with Smith, Ricardo, and Mill as their main proponents, is characterized by the assumption of a given structure of production which makes producing a physical surplus possible. If \mathbf{A} is an Input-Output matrix, and \mathbf{q} is a vector which indicates the activity level, then

$$\mathbf{s} = \mathbf{q}(\mathbf{I} - \mathbf{A}) \quad (1)$$

is the vector which represents the net product. Furthermore, \mathbf{l} is the labour vector and $\mathbf{q}\mathbf{l}$ is employed labour. With a wage rate w and a profit rate r , the prices are set, in long-run equilibrium, by the equation

$$(1 + r)\mathbf{A}\mathbf{p} + w\mathbf{l} = \mathbf{p}. \quad (2)$$

Classical economists tended to assume the circulation of precious metal. If one of the industries, the first, produces gold in which the prices of other goods are expressed, the price of the first good, formally expressed, is the *numéraire*. In addition, when the real wage is determined according to subsistence wage theory, the profit rate r is determined by the prices resulting from equation (2). That, in any case, accords with Ricardian doctrine.

Now Ricardo was of the view that the profit rate, determined in this way, must regulate the monetary cash interest rate: 'The interest for money . . . is not regulated by the rate at which the Bank will lend . . . , but by the rate of profit which can be made by the employment of capital' (Ricardo 1966 [1951], p. 363). Like Böhm-Bawerk, Ricardo appears to assume that entrepreneurial profits are not an essential, independent factor for analysis, since the interest rate is determined by the profit rate. Still, the abstraction from entrepreneurial profit based on Ricardo's assumptions is easier than in Böhm-Bawerk. In Ricardo, the profit rate is determined by real wages, given a production system and its productivity. The level of monetary interest thus apparently has no direct influence on the profit rate. For Böhm-Bawerk, in contrast, both sides of entrepreneurial credit play a role: capital investments have to be sufficiently productive for owners to be able to cover interest charges on loans from profits alone. Conversely, the level of the monetary interest rate influences the supply of capital. Böhm-Bawerk is apparently, first and foremost, concerned with the determination of what is called, in the language of the classics and in the theories of the Moderns, 'the rate of profit.' He often thinks, therefore, that capital goods are loaned directly without the mediation of money. However, the entrepreneur does not as a rule borrow capital goods, but rather the money to purchase capital goods. Therefore, the factors determining the interest rate, as opposed to the profit, rate must also be taken into consideration.

The discrepancy between the profit rate and the interest rate appears most markedly with Adam Smith; he asks about the . . .

. . . proportion which the usual market rate of interest ought to bear to the ordinary rate of clear profit. . . . Double interest is in Great Britain reckoned, what the merchants call, a good, moderate, reasonable profit. . . . In a country where the ordinary rate of clear profit is eight or ten percent, it may be reasonable that one half of it should go to interest, wherever business is carried on with borrowed money.

(Smith 1961 [1776], p. 109)

Assuming an interest rate and a profit rate, entrepreneurial profit is naturally dependent not only on the differences between equity and debt capital but also on their relationship.

Böhm-Bawerk did not think very highly of Smith as a theoretician of income distribution. Smith did not ignore the problem of interest on capital, but he did not really deal with it either. In his writings, profit sometimes appears as a deduction from the return from labour, at other times as a mark-up which exists because of the productive nature of capital (Böhm-Bawerk 1957, p. 70). Unfortunately, the determination of monetary interest also remains vague in Smith. Böhm-Bawerk's

critique is apt in places, but, with his abstraction from entrepreneurial profit, it does not answer the question of whether it is possible to do justice to Smith's observations, according to which the entrepreneurial profit not only deviates, due to windfall profit or excess loss, from interest, and also fails to reflect branch-specific risks, but instead can reach the same order of magnitude as the interest costs within the industrial sector of entire nations.

One issue in the current debate on this topic will be explored: It is discussed by authors who have gone back to ideas drawn from classic economics. In modern distribution theory, the post-Keynesian side (Kaldor) has suggested that the profit rate in the growth process is dependent upon the dynamic of investment, given the tendency to save out of profits, because higher investments lead, by means of higher prices and an improved capacity utilization, to increasing profits. The profit rate, therefore, can go much higher than the interest rate in long, sustained-growth periods and is not directly influenced by it. Others believe transactions in the banking system, guided by the policies of the central bank, regulate money interest, and prices and profit must make it possible for owners to pay interest. According to this conception, prices are determined less by demand than by costs; competition ensures that prices only exceed production costs, including capital costs which are dependent upon interest, and secure a profit which covers corporate endeavours and risks specific to a sector (Pivetti 1991).¹⁷

Marx also continues in the tradition of the Classic economists, at least when he differentiates between the profit and interest rates. He assumes that a general profit rate of e.g. 20 per cent has developed so that whoever has access to enough capital can also make a profit of 20 per cent.¹⁸ The use-value of money, therefore, is that it can be transformed into profitable capital; interest is the price the entrepreneur pays for the borrowed capital. Marx (1990, vol. 3, p. 478) here rejects the term 'natural rate of interest'; how the division turns out and what level of interest results depends on cyclical influences, as in purely monetary theories of interest:

If we consider the turnover cycles in which the modern industry moves . . . we find that a low level of interest generally corresponds to periods of prosperity or especially high profit, a rise in interest comes between prosperity and its collapse, while maximum interest up to extreme usury corresponds to a period of crisis.

(Ibid., p. 482)

Interest and profit rates thus move – apart from the exceptions pointed out by Marx – in opposite directions.

These few comments must suffice to show that the Classical authors, even down to their modern successors, and even including Marx, stand out with their sharply outlined theories of the distribution of wages and profits, which were not coupled with a comparably precise theory of interest. What is clear, however, is that they view interest rates and profit rates as independent objects and not simply phenomena to be identified by abstraction. Nevertheless, it is not even clear how the Classical authors defined interest. They were not theoreticians of productivity in

the way that Böhm-Bawerk defined the concept. Even Smith – insofar as he did not argue in terms of surplus theory – came close to a productivity theory with reference to wages, profits, and rent (each factor had its natural price, and the prices of the deployed factors were added to the product price), but he failed to provide a quantitative explanation for the division of profit into interest and entrepreneurial profit. Insofar as he provided reasons for the existence of monetary interest, he would have had to have dealt with entrepreneurial profit as a residual.

For a long time there were also important differences between Neoclassical authors; we have already touched on those between Marshall, Walras, and Böhm-Bawerk. They were in agreement, however, in understanding interest primarily as a magnitude in the real economy (in this way related to the classical rate of profit), rather than as a monetary amount. Thus, it is easier to understand why Schumpeter thought his return to a monetary interest theory, as Mercantilism had described it, was revolutionary, and why Keynes was so proud that he had defined interest as compensation for a renunciation of liquidity. (Instead of talking of rates of profit, he coined the phrase ‘marginal efficiency’ and retained Marshall’s terminology for ‘quasi-rent’). Marx’s attempt at a definition, in contrast, does not take us much further. While it may very well be logical to designate the average profit yield as the ‘use-value’ of capital, it becomes, however, all the more unclear why the price of monetary capital then does not rise to this rate of return, why thus the interest rate lies significantly below the profit rate. Marx viewed the question of the ‘division’ of total profit into entrepreneurial profit and interest from a cyclical viewpoint and as a question of power; if we want to understand his position, we probably have to think about the stressful relationship between shareholders and managers, which is today examined at the level of the individual company by means of the principal agent theory, among others.

One thing does appear clear to me, however: none of the Classical authors arrived at the idea of interpreting the interest relationship as an intertemporal exchange. The dating of goods and prices did not even fit into the Classical system, which started from the observation of stationary conditions. The admittedly rather general analogy between a credit contract and a tenancy probably comes closest to this. It must have appeared natural, to a Classical author, to start from the equivalence of the sum of money lent and the sum paid back in a self-reproducing system and not to understand these as different goods, the way Böhm-Bawerk does; then interest was the price for the use of this capital asset or loan. This understanding corresponds to the bias, already found in Locke, in favour of the creditor in the inflation process.¹⁹ In his lectures, Smith (1978, p. 101) also frankly advocated legally setting the repayment of loans at the amount of their original purchasing power (he was referring, naturally, to the precious metal content of the money lent). He saw, of course, that a government would hardly be willing to enact a law which it would have to apply to itself first of all, since it was also in debt and also responsible for currency debasement. The unspoken dilemma apparently consisted in the fact that a simple definition of utilization and of repayment was possible only in a stationary system, whereas the functions of monetary capital which influence interest are aimed at changing the conditions of reproduction.

While the search for a unified principle for determining interest has led us on a labyrinthine path almost back to the starting point (utilization theory), the analysis of productivity allows us to more easily establish relationships between the schools. Only when there is a surplus in the sense of the formula (1) are there positive solutions with a positive profit rate in formula (2), and vice versa. Another mathematically demonstrable relationship says that there is a surplus exactly when the maximum profit rate (which would be reached if the wage rate in the production system could fall to zero) is positive:

$$(1 + R)\mathbf{Ap} = \mathbf{p}. \quad (3)$$

This maximum profit rate R , discovered by Sraffa (1960, App. D.3), turns out to be Böhm-Bawerk's average reciprocal production periods for an economy in so-called standard proportions; it is, at the same time, as high as the capital efficient K/Y as we shall show in the section on Fisher:

$$T = 1/R = K/Y.$$

It is clear that the average production period T tends towards infinity in a system that can only produce an arbitrarily small surplus or necessitates a potentially infinitely large capital stock for the production of a small finite stream of consumer goods. Thus, to ensure that there is space for distribution, a finite net production period is required. Let us assume for the sake of simplicity that real wages are included in the means of production. To choose, from among several production systems, that with the shortest production period apparently leads, then, to the same technique as a decision based on the criteria for the maximization of the profit rate, thus the selection of the largest among the 'maximum' profit rates of each system.

Böhm-Bawerk failed to recognize the simple correspondence between the Classical surplus approach and the maximization of the profit rate, on one hand, and his minimization of roundabout methods of production, on the other hand. It cannot be easily generalized without, for example, overcoming the precondition that the economy is in standard proportions. Many more difficulties in capital theory then come into play, which quite early led to critiques of Böhm-Bawerk's lucid terms 'production period' and 'Greater Productivity of Roundabout Methods of Capitalist Production'.²⁰

The path of didactic exposition can be shorter than the path of discovery. In Böhm-Bawerk's text, the example of catching fish and netting returns again and again – with catching fish by hand standing for production without capital, and netting standing for roundabout methods of production – which comes from Roscher, of all people, who is not highly thought of as a theorist. Naturally, Böhm-Bawerk owes a great deal to classical English economics, which he analysed in detail, until with Menger and his work in Austria, as well as with Marshall and Jevons in England, Walras in France, the new Neoclassicism came into being. However, reading Böhm-Bawerk's history of theory as the critical preparation of his theoretical magnum opus – because that was the function of the published

volume for Böhm-Bawerk's intellectual development – it becomes surprisingly clear how often he feels compelled to explore the ideas of German authors in detail. They prepared the way for the Austrian version of the Neoclassical revolution (and, incidentally, also exerted some influence upon the English via Marshall).

This historical context, which was reflected in reference works published in the final years of the nineteenth century, such as *Palgrave*, is once more receiving attention (Streissler 1990), after it appeared to have been forgotten for a time, both abroad and in German-speaking countries. Even modern readers well-versed in the history of theory have a very difficult time with authors such as Knies, and even more so with the little scattered pearls of theoretical wisdom of someone like Roscher (who was called by Böhm-Bawerk the 'distinguished economist, whose most signal merits do not . . . lie in the sphere of acute theoretical research', Böhm-Bawerk 1957, p. 128).

Capital and Interest is not only in itself a key text in the history of theory and a model of systematic thinking; we recognize in this work how Böhm-Bawerk critically prepared the way for his important theoretical innovation, and it also makes apparent, like hardly any other text, the connecting threads of international theoretical development. The period between the publication of the first edition and the First World War can be read out of the supplements appearing in later editions and in Böhm-Bawerk's *Exkursen* [Excurses], which were the subject of much discussion. The first version of his first volume, perhaps more interesting but less studied than this, is instrumental for an understanding of the background to the debate over Böhm-Bawerk.

Eugen von Böhm-Bawerk's *Positive Theory of Capital*

John Maynard Keynes frequently emphasized how seldom economists combined in themselves the skills necessary for the proper application of their science, since they should be able to think mathematically, historically, and philosophically, as well as to negotiate like statesmen. Few were to bring together these talents as did Eugen von Böhm-Bawerk, who was nevertheless quite different from Keynes. Both possessed great intelligence and economic experience, and both assumed government responsibility. The parliamentary Habsburg dual monarchy which Böhm-Bawerk served was nearing its end, while the British Empire survived Keynes. But Böhm-Bawerk, conciliatory in person but otherwise an unwavering man of affairs, emerged as an energetic advocate of the liberal economic system, inspired by *one* essentially new idea. Keynes's flexibility was, by contrast, both brilliant and unsettling. Shaken by the collapse of the European order in the First World War and by the Modernism of the intellectuals of his generation, Keynes first attracted attention with his daring suggestions for Allied peace and then for his post-liberal economic and theoretical conceptions. How much suffering Europe would have been spared, if his text on the Peace of Versailles had had an impact on day-to-day politics beyond the immense journalistic success it enjoyed. And I think that disappointment over the incompleteness in Keynesian macroeconomic management should not prevent us from being thankful for the

stabilization that was achieved. He sought a way to reorganize the world order during World War II; shortly before the outbreak of war, he had in his *General Theory* described a national Keynesian economic policy. If he had survived longer as an active economist, he would certainly have put forward a revised 'Keynesianism' and argued for a steady growth policy during the recovery after the Second World War.

Throughout the exertions of his academic career, his ministerial posts, and the numerous controversies fought out with the most important economists of Europe and America, Böhm-Bawerk presented, in contrast, an image of self-assured resolve in setting forth his viewpoints. This can already be seen in the history of his three-volume *Kapital und Kapitalzins* [Capital and Interest], the basic core of which, *Positive Theorie des Kapitals* [Positive Theory of Capital], we are going to explore below. Though in science it may unquestionably be the rule that a new idea is developed and then measured against the ideas that came before, the scientist's own idea is published first and only afterwards does there come critical reflection on the work of predecessors. Böhm-Bawerk, however, managed to publish a *Geschichte und Kritik der Kapitalzins-Theorien* [A History and Critique of Interest Theories] in advance of his *Positive Theory*, so that the foreword to the first edition of *History* is dated in 1884 while the *Positive Theory*, though conceived earlier, finally appeared five years later.²¹ Reversing the order would at the very least have minimized the risk of being anticipated by others.

Signs of haste might have been expected in the first volume. However, Böhm-Bawerk's comprehensive history of economic thought has been repeatedly praised; it is a masterly and wide-ranging history of the recurring basic ideas explaining the existence of interest, of importance for future generations.

How firmly Böhm-Bawerk stood by his core idea is demonstrated by the numerous controversies documented in his works. He compiled the clarifications which he himself thought to be the most important and directly related to the book in another volume, *Exkurse zur 'Positiven Theorie des Kapitals'*, which he appended to the third edition. As he wrote in the 1909 foreword, by separating off these additions he wanted to offer a 'closed exposition' (Böhm-Bawerk 1961, vol. II/1, p. XII) of his capital theory, whereas the additions were related to aspects to which discussions in specialist journals were directed.

Spinoza's *determinatio est negatio* is appropriate for Böhm-Bawerk, with his strict discrimination of cases, reminiscent of legal forms of argumentation. Combing through older theories of interest which rivalled his own helped him ensure not only the originality of his new approach, but also its substance. He did not see his task as determining which early idea pointed in the direction of a later fully elaborated theory. He wanted to verify in detail how far particular lines of thought had already been investigated. In this approach he differed from Marshall, who was so dedicated to establishing the continuity of the history of ideas that he even blurred distinctions between Classical Theory and the revolution in value theory which he helped lead and projected the Neoclassical Theory of supply and demand back on to Ricardo. While Marshall discovered signs of the modern disposition in various authors from the past, Böhm-Bawerk countered

with one of his frequent and pertinent comparisons, often borrowed from the natural sciences:

It is as equally insufficient as a scientific explanation when one explains the ultimate cause of the formation of a rainbow by saying that it is caused by sunshine striking a rain cloud at a particular angle. Science is not about the observation that the interesting appearance of the seven-colour rainbow is the result of a sunbeam striking a rain cloud, but is instead concerned with the specific explanation of the way in which, and through what intermediary processes, the empirical causes at hand produce this kind of effect.²²

It might be useful to select from among the large number of sometimes certainly quite hazy notions about interest two such theories which preceded Böhm-Bawerk and which he criticized. Böhm-Bawerk is, first of all, seeking to understand capital not as an independent factor of production, such as land and labour, but instead as something that derives from these. For that reason alone, because capital for him consists of produced means of production, it should not be understood as an asset that can be lent like land through lease, a prevalent belief among his predecessors. By contrast, Böhm-Bawerk wished to derive interest from an intertemporal exchange, in which creditors do not receive their capital back augmented by interest but instead exchange their present asset for a future one. It is the differentiation in time of the goods that plays here a decisive role. Following Menger, Böhm-Bawerk differentiates between goods that roundaboutly satisfy a need and those which directly do so. Capital is, then, the quantity of semi-finished products generated and used in the individual steps of 'roundabout production'.

Second, however, Böhm-Bawerk also opposed the notion of utilization theory, which Lujo Brentano in his *Versuch einer Theorie der Bedürfnisse* [Toward a Theory of Needs] (1924 [1908]) continued to present after the publication of Böhm-Bawerk's *Positive Theory*. Utilization theory actually derives from the notion encountered in the ancient world that interest is a portion of the profit paid for the use of capital. When a herd of cattle is lent for several years and increases over the course of time, the original owner and the one who borrowed the herd will naturally divide the offspring between themselves. The prohibition on interest which Böhm-Bawerk discusses in his *History* was attributed to Aristotle, who objected to interest and considered it to be usury when interest was paid upon money, since he understood money only as a means of exchange. Of itself, it bore no 'natural' fruit, and so there was none that might legitimately be divided. However, utilization theory could be employed when the object being lent (for example, a sack of coins) was distinct from its value. When money is lent, the value of this loan can be used – perhaps in breeding cattle, to continue with the previous example – so that there is a surplus yielded which can be shared with the lender.

Explaining his derivation of the interest relationship from intertemporal exchange, Böhm-Bawerk writes that money is lent to a debtor and may be paid back in another form. Brentano counters with a numerical example:

The hundred mark pieces do pass into the possession of the debtor, but not their value. . . . We hold fast to the old doctrine which sees in interest the debit or the price for the transfer of the use of capital.

(Ibid., p. 113, my transl.)

This traditional concept of value, upon which the permanence of utilization theory is based, since physical capital goods are of shorter duration than the debtor relationship, is found in Classical Theory. Ricardo believes that he had found a workable expression for value in gold, because he assumed that the labour costs of gold production altered very little. He attributed exchange value (the long-term average price) to the combination of labour costs (including the labour embodied in the means of production) and the interest charges appropriate to a production period (for him, the time necessary to bring the goods to the market). Hence, exchange value was influenced by labour costs and interest charges. The goods produced by processes with higher capital intensity had, at a positive rate of profit, higher prices than the direct and roundabout labour costs occurring at a zero rate of profit, while the goods produced by processes with lower capital intensity have prices lower than these costs. Exchange value found an appropriate expression in gold because Ricardo – and this, of course, cannot be proven – assumed an average capital intensity, so that interest charges would have no special influence on the production of these goods.

For Adam Smith, exchange value consists of three components: wage, profit, and rent. Even if the Classical authors did not agree on the explanation of exchange value, they all followed Smith in now viewing interest as an income separate from profit:

[Interest] . . . is the compensation which the borrower pays to the lender, for the profit which he has an opportunity of making by the use of the money. Part of that profit naturally belongs to the borrower, who runs the risk and takes the trouble of employing it; and part to the lender, who affords him the opportunity of making this profit. The interest of money is always a derivative of revenue.

(Smith 1961 [1776], p. 59)

There is no place for this point of view within the frame of an intertemporal explanation of prices, where an exchange between present and future goods takes place. The exchange relation between ‘corn tomorrow’ and ‘corn today’ can differ from the exchange relation between ‘silver tomorrow’ and ‘silver today’ – an exchange relation that in modern theory is today known as an ‘own rate of interest’, which can be different for each kind of product in an intertemporal general equilibrium. In order to determine the ‘value’ to be paid back, the arbitrary selection of a *numéraire* is necessary. Should the ‘value’ be fixed in ‘corn’, ‘silver’, or a third element, for example, ‘gold’? One strength of intertemporal theory is that it can go some way without answering this question. But even if the own rates of interest of corn and silver are the same, they will not be derived from the rate of profit in production but are, for all intents and purposes, independent of it. Böhm-Bawerk almost entirely reverses the classic approach: profit is possible only because of the intertemporal exchange.

Let us now consider the basic features of Böhm-Bawerk's system. We cannot dwell on the definitions of basic terms which he constantly defended, such as 'subjective value', 'price', and 'capital', but which he essentially shared with others, however much he sought to be terminologically precise. Characteristic, however, is his use of the term 'average production period', which is supposed to measure the period of time between the provision of the means of production and the completion of the product – basically an elaboration of what Ricardo meant with his 'time it takes to bring a commodity to the market' (Ricardo 1966 [1951], p. 37). Formally, it deals with the intervals between the deployment of labour, consisting of the average of t time units weighted by the labour deployment, l_t and thus:

$$\frac{l_1 + 2l_2 + \dots + tl_t + \dots}{l_1 + l_2 + \dots + l_t + \dots}$$

As a rule, it is assumed within the scope of this theory (and, above all, by Böhm-Bawerk himself) that the progression of these labour deployments breaks off after a finite number of steps: 25 years ago the tree was planted alone with the aid of pure labour, and this year the tree was felled and transformed into a chest, such that in this example there are two chronologically divided labour activities. Or, eight years ago grapes were planted, gathered, and pressed and the wine drawn off and set aside in a natural maturing process that would make it particularly enjoyable today. The average production period, accordingly, amounts to $(l_1 + 25l_{25})/(l_1 + l_{25})$ or $8l_8/l_8$. If, in the example with the chest, $l_1 = 19$ and $l_{25} = 1$ is chosen, 2.2 is the result. In the case of the wine, 20 labour units were also used as well; the result, independent of this determination, is a period of 8. If the production process is evenly 'filled' – that is, the labour inputs are equal – we obtain for a production process taking n years an average production period $(1 + 2 + \dots + n)l/nl = n(n+1)/2n = (n+1)/2$; thus approximately half of the entire length of the process.

Using visual examples, Böhm-Bawerk now seeks to establish the empirical generalization that output increases with the extension of roundabout production, at, however, a decreasing rate. Moreover, he considers inventions as the discovery of more productive roundabout methods, whereby the newer ones 'for the most part probably' take longer. He wants in this way to specify a measure for the physical productivity of production processes which can be the basis for their valuation.

The other basic building block of his theory is the underestimation of future products of the same kind and number compared with today's products. This idea represents for him the core of his interest theory; it involves the well-known three grounds for underestimation. Modern textbooks follow him entirely when he calls the sequential availability of products a particular 'modality' – we would say 'dimension' – which permits the temporal differentiation of goods by analogy with their spatial availability (though, naturally, the irreversibility of time renders the valuation of goods in the past meaningless). Since today one is so used to Böhm-Bawerk's ideas, it is amusing to read in later editions how he found it

necessary to correct what were, to some extent, very basic misunderstandings on the part of prominent contemporaries.

Böhm-Bawerk's considerations are finally pulled together in the determination of 'the interest level in market activity.' The macroeconomic equilibrium is fixed as a whole, so that in one particular enterprise, which represents all enterprises, the yield generated per worker is a function (stipulated by Böhm-Bawerk with arbitrary numerical examples) of the production period. The profit per worker is multiplied by the number of workers who can be employed when a certain subsistence fund is available and a certain wage rate is set. Since not all workers begin a production process at the same time, but instead some are busy at every step of the production process, through 'staggering' some complete a product, while others have just begun; the subsistence fund is not divided by the wage rate, in order to ascertain the number of workers who can be employed with the funds. Instead, because of staggering, the subsistence fund is sufficient for approximately double the number of workers.

If there is a state of full employment, the product of the number of employed people L and the targeted profit per worker results in the entire profit for the economy; put in relation to the capital advance payment, this results in the rate of profit for all of the capital invested. With r as the rate of profit, K as the amount of capital (subsistence fund), w as the wage rate, T as the production period, and $f(T)$ as the production function per capita output, we come up with the formula Böhm-Bawerk (1961, vol. II/1, pp. 451–3) used in his table:

$$r = \frac{L[f(T) - w]}{K} = \frac{\left(\frac{2K}{wT}\right)[f(T) - w]}{K}.$$

In so doing, the length of the production period must be chosen so that the rate of profit achieves a maximum. The wage rate must be selected so that given the capital, full employment can be achieved. Böhm-Bawerk assumes that in deviations from full employment, the real wages adapt in order that, especially when there is unemployment, decreases in real wages permit the reestablishment of full employment. Finally, the amount of capital made available depends on the balance between those whose diminished valuation of the future, with r as the interest rate, is comparatively smaller and who therefore emerge as creditors, and those whose diminished valuation of the future, given r , is comparatively larger and who therefore seek capital.

As an entrepreneur, whoever makes his own capital available will be compensated according to the rate of profit for waiting for the returns. Behind this compact formula, which is implicitly communicated by Böhm-Bawerk only in his tables, is hidden a complex intentional intertemporal equilibrium. It must establish prices, especially factor prices, in which the plans of all participating in the economic process can be simultaneously fulfilled.

Whether and under what circumstances such an equilibrium exists, to what extent it demonstrates the stability postulated by Böhm-Bawerk which finally

gives it purpose, is a question whose answer still indirectly plays a large part in theoretical research, where new models are constantly designed to illustrate aspects of the total process with different details.

Böhm-Bawerk is occasionally called the second (bourgeois) Marx. It is arguable whether these two names best represent the theoretical influence of German-speaking economists. What is certain is that Böhm-Bawerk was the first and the most uncompromising writer to formulate critical economic objections to Marx's system. The most important of these objections was already formulated in successive editions of *Capital and Interest*.

From Smith, Ricardo, and the other writers of the classical era, Marx adopted the notion of a surplus which can be produced in an economy at a given level of employment, with a given production method, and which is available for distribution. Ricardo, as everybody knows, saw the distribution as follows: workers are fed what is necessary for their subsistence – which can change historically; this real wage is originally subtracted from the entire product to establish beforehand the actual surplus, as well as the means of production required for reproduction. With the exception of monopolistic elements, the least productive but cultivated land will yield no return, so that the production surplus still attained there is the profit which determines the rate of profit, in relation to the capital advanced. This must also be valid for industrial production and in lands with more productive soils, although the difference in output between richer and poorer soils is awarded to landowners as the differential rent. With capital accumulation and the expansion of production, the transition to poorer land threatens a decrease in capital profitability and a decline in the forces of growth so long as technical progress or the development of new territories cannot compensate for the decline in productivity.

Depending on the strength of their belief in progress, successors of Ricardo, such as Mill, might look forward to either an increase in general well-being or the feared stagnation, but there was also the possibility, explored by Marx, that the Ricardian system could be transformed into a theory of exploitation. Ricardo had explained the natural price of a commodity, adjusted to the conditions of uniform reproduction, first by means of the amount of labour embodied in each commodity, so that he might – for want of a mathematical theory, we might say today – have a solid foundation for determining this price. However, he knew from the very beginning that the goods produced could not as a rule be exchanged according to the amount of labour involved in their production, when in the manufacture of products, for example, comparatively large amounts of direct labour might be expended, while in the use of raw materials unequally large amounts of 'indirect labour' are expended as 'capital'. Ricardo understood natural price or value, therefore, as a modification of the labour content 'embodied' in it when he, as mentioned earlier, also took interest costs into consideration.

Marx gave this approach an ideological turn when, moving away from Ricardo, he once and for all defined the value of a product as labour value and attempted to infer (in the third volume of his work) the equilibrium price from a 'transformation' of the value into price.²³ In the first two volumes of *Capital*, he assumes a correspondence between labour value and prices. Therefore, he could now say

that the value of the labour power corresponded to the value of the reproduction of the worker, thus to the labour value of the goods included in the real wage. From that follows, as is well known, the division of the entire time that workers spend working into necessary labour, which ensures their subsistence, and surplus labour, which Marx then understood as exploitation of workers. In the transformation, the notion of exploitation is said to remain, despite the difference between price and value, because Marx seeks to prove that profit can be presented simply as the redistribution of surplus value.

But we are not going to explore the failure of this approach. When Böhm-Bawerk published his work *Positive Theory of Capital*, the first volume of Marx's *Capital* was already in circulation, the second volume had been published by Engels, but the third had only been announced. Böhm-Bawerk did not therefore devote space in his book to the shortcomings of the 'transformation' of values into prices, since he was as yet unaware of this; but instead he concentrated on the decisive problem: Is what Marx calls 'exploitation', specifically the siphoning off of a surplus product, to be understood as the result of particular historical conditions, or is it the necessary result of the conditions of all production?

The importance of this question can be seen today when the impossibility of transforming values into prices is evident, while Böhm-Bawerk's question still remains. When, in particular, manufacturing branches goods are produced not in single production but also in joint production, negative labour values can emerge so long as the long-term average prices – or production prices, as Marx calls them – are positive. From that, it follows that systems can be constructed through thought experiments in which the surplus value is negative but the profit is positive, so that the Marxist notion of 'profit' as redistributed 'surplus value' is convincingly refuted (Steedman 1975). A positive rate of profit, then, exists with, so to speak, negative exploitation.

Naturally, Marxists have not been slow to explain away this paradoxical result. However, even if interpreting profit as exploitation had some appeal today, the deciding question – is it possible to eliminate profit and thus exploitation? – would still go unanswered. That is the core question to which Böhm-Bawerk directs discussion.

History has, in the meantime, passed judgment on the attempt to eliminate interest and profit in a real, existing socialist system. Böhm-Bawerk was writing at a time when the demand for a society without exploitation was first raised. He sought to counter this by exploring the assumptions of the socialists, demonstrating that the phenomena to which he traced back interest and profit – the greater productivity of roundabout production and preference for the present – would also arise in a society with nationalized means of production, and in passing he even refers to corresponding phenomena in the preindustrial economic forms among primitive peoples, the ancient world, or in the Medieval world, where *prima facie* capitalist forms of exchange were not thought to exist (Böhm-Bawerk 1961, vol. II/1, pp. 431–7).

It might be that in his interpretation of the past, he adapted it too much to his modern categories. However, his evidence that even in socialism, labour must

be remunerated, that a labour price would be implied which remained below the price of future industrial products, is very striking; this difference offers space for 'surplus value to develop'. In his own way, Marx (1971b) had also recognized, in the *Critique of the Gotha Program*, that in socialism, the worker can never receive the complete return from labour, because the future has to be provided for, reserves have to be established, and so on. However, only Böhm-Bawerk – not Marx – made the attempt to explain what these provisions had to consist of, according to rational calculation, starting off from the urgency of present needs and the greater output of manufacturing when investments are made with regard to improvements in productivity. To what degree terms developed by Neoclassical authors could logically be used for societies which are not organized along the lines of a market economy has often been discussed. In Eastern Europe, naturally, even these discussions were limited, and the operational failings of real existing Socialism, which would also be associated with a lack of individual initiative, were thereby strengthened by a dogmatic clinging to Marx, which hindered the development of the theoretical concepts necessary for more efficient planning.

Among other texts included in Böhm-Bawerk's collected works, there are two which deserve mention in this connection. We will begin with the one that deals directly with Marx. When the third volume of *Capital* finally appeared, Böhm-Bawerk published a critique entitled *Zum Abschluß des Marx'schen Systems* [On the Closing of the Marxist System] (1896), in which important arguments against the Marxist method of transforming values into prices were presented; the solutions which Hilferding, the most interesting proponent of Marxist theory at the time, sought to provide, offered nothing in the way of an alternative construction. This inability, hidden under many words, to provide a convincing answer to the critique continues. Since the weaknesses of the Marxist arguments were felt in the old German Democratic Republic, no one risked for a moment a theoretically rigorous discussion of Marxist economics with its preconditions and consequences. Editions of Marx's works were published which show evidence of the precision developed by the German philological tradition, but this led to no debates on Marx comparable to the theoretical dialogue in neighbouring Eastern European countries, to say nothing of the response among Western economists.

One anecdote concerning Böhm-Bawerk will have to substitute for a longer explanation: Two years before German reunification, an economist who had just fled the GDR asked me how Marx was refuted in the West and how prices were set with supply and demand. Marx had shown, he said, that supply and demand are forces which could only explain the deviation from a state of equilibrium; at a state of equilibrium, however, they are neutralized and thus determine no prices.²⁴ I could answer that this problem was taken up by Böhm-Bawerk in the previously mentioned essay and, indeed, with one of his most elegant comparisons:

We let a balloon rise. Everyone knows that the balloon rises because it is filled with gas which is thinner than the air in the atmosphere . . . The balloon rises only as long as the density of the atmospheric layer immediately surrounding

it is greater than its own density, and it stops rising the moment its own density and the density of the surrounding air are in equilibrium. . . . But how would this look to the Marxians? At a certain altitude both forces stop, the density of the balloon and the density of the surrounding atmospheric layer are at an exact equilibrium. They 'cease functioning because of that'; 'they lose their explanatory capacity.'

(Böhm-Bawerk in Weiss 1968 [1926], p. 411 sq, my transl.)

This university lecturer of economics did not understand that supply and demand quite easily explain a price, if the amount of supply and of demand could be defined as functions of prices, as happens in Neoclassicism. And he did not know that the solution to his problem had long been included in an early, prominent critique of Marx.

Böhm-Bawerk's *Zum Abschluß des Marxschen Systems* [On the Closing of the Marxist System] admittedly focuses only secondarily on the Marxist notion of 'demand' and 'supply'. It focuses instead on his derivation of production prices from labour value, which was faulty, because Marx assessed the inputs in labour values, yet disregarded the outputs by redistributing the surplus to production prices. The mistake was corrected by Bortkiewicz (1907), who showed that in a system of interdependent equations, the inputs could also be transformed, and in so doing the representation of 'profits' as 'distributed surplus' in general is no longer possible, except in special cases.

In *Macht oder ökonomisches Gesetz* [Power or Economic Law], Böhm-Bawerk (1914) tackles the question of how much scope there is for power within the economic framework. It quickly becomes clear to him that a phenomenon such as the monopoly of 'power' is constituted not outside but within economic laws, in fulfilment of the laws of price, because the monopolist can only really set a price that exhausts potential profit by taking into consideration the intensity of demand. The important discussion of this principle occurs in discussion of the confrontation between labour and capital in the battle over wages. Here he takes a stand against the so-called power theories of distribution, which, among other things, had advocates among the Historical School. He wishes to demonstrate that even a strike cannot permanently prevent the setting of real wages at a level predicted by economic laws. A distribution according to the theory of marginal productivity must eventually become established. He concedes that the scope for changes in personal income distribution is greater than that for functional changes of distribution.

Böhm-Bawerk himself silenced, with convincing arguments, most of the many critical voices that spoke out against him during his career. Some objections, however, I think are valid – in any case, they were effective and have determined, in an altered form, the argument about the theory of intertemporal equilibrium up to the present day.

As suggested previously, the determination of the rate of interest in the real economy makes it difficult to include monetary forces. The theory of interest with which Schumpeter argued against his teacher Böhm-Bawerk and outlined in his

Theorie der Wirtschaftlichen Entwicklung [Theory of Economic Development] (1912) and various shorter texts (Schumpeter 1951a, 1952 [1913]) suggests precisely this. Schumpeter believed that present and future preferences could balance each other, out and, in any case, they did not exert a deciding influence on monetary interest. He saw such interest determined much more by a process of economic development, during phases of growth entrepreneurs introducing new production methods in order to realize an additional profit, from which they pay the interest owed as a result of the financing of investments to increase productivity. But Schumpeter never established clearly and satisfactorily how the stream of differential profit is coordinated so that a uniform interest rate for investment credit is determined by supply and demand.

However, Schumpeter is only one of many who wanted to trace the phenomenon of interest back to monetary causes. In a review of Keynes's *General Theory*, Schumpeter (1951 [1936], p. 153) also welcomed – though he otherwise strongly opposed Keynesian concepts – at least Keynes's monetary theory, which he thought was related to his own, insofar as there was a differentiation between money interest and return on investment in material means of production (in Keynes, the marginal efficiency of capital). Keynes's liquidity preference theory is an approach of a different kind. Holding money is a renunciation of interest-bearing investments and therefore can be explained only when there is a potential for a particular advantage in liquidity. To the extent that this does not consist in cash holdings for transaction purposes, holding on to money can only be rational when the alternatives, holding securities or investing in the production of goods, are not deemed sound, because a fall in the value of the stock market is feared, or the possibilities for investment are limited or do not promise a satisfactory profit.

It is well known that Keynes went so far as to entirely do away with the idea that interest was determined by uniform expectations on the part of economic subjects: The interest rate is ideally much more directly determined by a balance between two opposing groups, specifically those with optimistic expectations who expect increasing value in the stock market, who hope for a falling interest level and buy up securities, and those who, fearing increasing interest rates and falling stock prices, sell off their securities, remain liquid, and wait for better times.

It would have utterly contradicted Böhm-Bawerk's search for an underlying determination of a long-term, stable equilibrium to explain interest in such speculative terms. Individual preferences were not, for him, the expression of a speculative disposition but were, rather, anchored in the structure of the personality. For that reason, he could be predisposed to take a step closer to the Historical School here and consider how people, rather than carrying out a complete economic calculation when making decisions about buying and saving, instead create 'secondary' rules, according to which one person decides to get out of debt, another person saves money to buy a house, and a third person wants to secure a particular education for the children. These secondary rules, although originally developed by reasonable individuals, could nevertheless easily come into fleeting conflict with a new economic calculation – for example, when individuals

forget the goal, save money only out of love of ‘mammon’, and neglect the basic necessities for themselves or their family (Böhm-Bawerk 1961, vol. II/1, p. 479). Only the combination of all of these thrifty or wasteful characteristics in a society determines the balance between future-orientation and present-orientation, which is therefore certainly perceived not as changeable moods but instead as institutionally grounded decisions about the shaping of a future over a longer time period. This aspect of Böhm-Bawerk’s interest theory anticipates the modern lifetime hypotheses of consumer demand.

Early on, Böhm-Bawerk’s conception of the production period was also a much debated issue. As we have already seen, he believed that the law of the greater productivity of longer roundabout methods of production and the hypothesis that inventions extend roundabout processes were empirical observations, which may have admitted of exceptions, but which on the whole suitably reflected reality. Now it is the right of the theoretician to make empirical generalizations, to which there may well be many exceptions, if only the hypothesis is clearly enough designated as such, as indeed our author did. The explanatory power of a theory naturally declines when contradictory observations of reality are made. Since the production period for the economy on average can only be determined with difficulty, indicators must be found which promise closer approximation. One such indicator is the capital coefficient, hence the proportion of all invested capital to national product, each estimated in the prices of a particular period. If the percentage of the gross investment in national product is given, one can measure which multiple of gross investment gives the capital stock or after how many years it will be reproduced. These volumes have proved relatively stable over time and do not indicate that there has been an increase in the duration of roundabout production in the course of the twentieth century.

Conversely, it might be asked whether there is any measurement rule for the duration of the production period which would be consistent with the requirements and intended outcomes of the theory. In this instance, doctrinal history, as is well known, decided against Böhm-Bawerk. In the Reswitching Debate it was shown that the proportion of capital to labour (wherein capital is measured in the long run by equilibrium prices which result from a prescribed uniform return on capital) is not necessarily inversely correlated to the interest rate.²⁵ If various interest rates in increasing order are set in theory, according to a basic hypothesis of Neoclassical Theory, it must be expected that with increasing interest rates, technologies with decreasing capital intensity will be selected. Higher interest rates are interpreted as higher capital costs. If capital becomes relatively expensive, then industry makes greater investments in labour-intensive processes. Economically sound examples with numerical data can be found without difficulty, so that with a first interest rate a particular technology will be chosen, with defined production methods, which allow a given output to be produced with a particular expenditure on labour. With a somewhat higher interest rate, a different technology will be selected which actually corresponds to a lower capital intensity than corresponded to the previous one. However – in an example of this

kind – with a third, even higher rate of interest, the first technology turns out once again to be the most profitable in competitive conditions.

Basically, the production period is Böhm-Bawerk's measure of capital intensity, for the extension or reduction of the production period allows the adaptation of employment to the potential for hiring employees by means of changes of distribution. As we have seen, unemployment makes wages decrease and profits increase. Consequently, the production period is abbreviated, and with the available capital more workers can be employed. In the opposite case (for example, in the case of a flood of immigrant labourers) an extension occurs.

The Reswitching Phenomenon explains why this conclusion cannot be generally valid. Piero Sraffa modified the wine and oak chest example, cited previously, so that it becomes clear how the revenues from the process can fluctuate with the rate of profit for given production periods. When, as specified, twenty units of labour are applied to the wine for eight years, its price p_a , with a wage rate w and a profit r , amounts to $p_a = 20w(1+r)^8$. Accordingly, the price of an oak chest p_b , with a labour investment of 1 unit of labour for 25 years and 19 units of labour in the current year, is $p_b = 19w + w(1+r)^{25}$.

The relative price $p_b/p_a = [19 + (1+r)^{25}]/[20(1+r)^8]$ is independent of the wage rate. It is equal to one for $r = 0$. With a rising r , the price of the wine at first increases more rapidly, so that p_b/p_a sinks, but the tendency is reversed with an interest rate of about 9 per cent and, with an interest rate of approximately 17 per cent, the prices are again the same and $p_b/p_a = 1$. Although the roundabout processes, characterized by the temporal distribution of labour input, have remained the same, with two different interest rates the same value is attained.

It can easily be seen that the paradox cannot appear when – as done by Böhm-Bawerk – it is calculated with simple interest, rather than with compound interest. If, specifically, we replace $(1+r)^8$ with $1+8r$ and $(1+r)^{25}$ with $1+25r$, the p_b divided by p_a will become a monotonically declining function, which for small r correctly reproduces the price relation; then, however, because there is now no compound interest which makes the small labour input of 25 years ago relevant, it does not climb again. Böhm-Bawerk (1961, vol. II/1, p. 451, footnote) is thus making a mistake when he says that simple interest, instead of compound interest, is enough for his theoretical purposes and that consideration of compound interest will not change anything in his results on this basis. Garegnani (1960) was able to show that the mistake Böhm-Bawerk is making here is analogous to Marx's mistake in the unsuccessful transformation of values into prices.

This objection from capital theory, which at first appears quite formal, points to a large extent in the same direction as the Keynesian objection. Keynes points out that with an uncertain future, decisions about business investments could lead to an effective demand, which is insufficient to ensure full employment. When, as a result, wages and prices are reduced, the deflation process can even cumulatively further depress the propensity to invest. Keynes had the frightening deflationary spiral from the beginning of the 1930s in mind, a time when no Pigou effect or real balance effect helped. Through the Reswitching argument, even with foresight, the equilibrium mechanism is cast in doubt, to the extent that it is supposed

to regulate employment macro-economically: when the wage rate falls and the interest rate rises, not a more labour-intensive but a more capital-intensive technology might appear equally profitable. Thus, newly industrialized countries, such as South Korea, have at times used capital-intensive technologies with low wages when these technologies promised a competitive advantage. That argument does not mean that in a growing economy, a tendency toward full employment does not exist, but its proof requires the consideration of additional interactions; the Neoclassical mechanism is not always effective.

Objections have also been raised against Böhm-Bawerk that he takes the value of the capital stock at the beginning of the period within which he wants to derive factor prices in equilibrium as given. The capital stock consists, however – and Böhm-Bawerk himself points this out – of heterogeneous goods which serve reproduction and which have to be valued. To make such valuations, prices are needed. These prices are themselves dependent upon the interest rate, which still has to be determined at equilibrium, so that the argument now becomes circular (Garegnani 1960).

This objection from the point of view of capital theory is analogous to the earlier one raised against the production period. It can be overcome when the opening stocks in reproducible and non-reproducible resources are treated as physical data in an intertemporal equilibrium, as has been customary since Walras. This is the procedure in Arrow-Debreu models, in particular (Debreu 1959). In comparison to Böhm-Bawerk's factor price determination in a stationary system, however, another flaw emerges. There is no longer a clear, fixed uniform interest rate, so that without additional assumptions, it is also not possible to speak of 'the' money interest rate, because the opening stock is on hand in more or less accidental proportions. In order to observe this, the intertemporal equilibrium is viewed over a certain number of periods (which form the time horizon), as a result of an exchange between participating economic subjects. They agree for each future date how much of each product they would like to supply or demand at a given price. An intertemporal equilibrium then brings the sum of supply and demand into balance, not only for the present but also for future goods within a time period by the stipulation of an equilibrium price.

Here it now becomes apparent just how profound Böhm-Bawerk's intuition was, understanding interest not as the price for a service such as 'abstinence', but instead as a pure exchange relation between future and present goods. Interest could now be calculated for any item which appears as a consumer product or a means of production; a particular good which could assume the function of money is not identified. When it is agreed that for 103 t corn tomorrow, the day after tomorrow 105 t corn is promised, the interest rate expressed in corn between these days equals $(105/103) - 1$, thus about 2 per cent. This so-called own rate of interest of corn is thus $p_1/p_2 - 1 = x_2/x_1 - 1$, when p_1 and p_2 , x_1 and x_2 represent the agreed-upon ('discounted') prices for corn, or rather the amounts considered for exchange tomorrow and the day after tomorrow, and x_2 is promised for x_1 , so that $p_1x_1 = p_2x_2$. The term 'own interest' comes from a further development of Böhm-Bawerk's idea of intertemporal exchange and was transferred through Sraffa to Keynes (1973 [1936], p. 223).

Obviously, these own rates of interest are not the same for all products, because if a product – for example, corn – is available at the beginning in larger amounts by comparison to other opening stocks, the scarcity price for corn will be rather low at the beginning but will rise when provisions are exhausted and the prices are more strongly influenced by production costs. This increase in the (discounted) corn price means that the own interest rates are low at the beginning and must increase.

There are, then, basically as many own rates of interest as there are products.²⁶ When the profitability of the process is measured in every period in terms of a particular product, so that perhaps the rate of return of steel production and wood production are both measured in corn, the rates of return will be the same, expressed in corn, and equal to the own interest rate of corn. To that degree, equilibrium here means that further investment in processes is no longer profitable, as the intertemporal balance is fixed. It ensures that the arbitrary nature of capital stock available at the beginning is balanced out through gradual adaptation to the level of production and consumption, producers and the consuming public each substituting the means of production and consumer goods, according to changes in relative prices. However, the measurements of the profitability of production processes vary according to which product is used as *numéraire* and are equal to the own rate of interest of the chosen good.

Now, it is a very remarkable result, proven only in the last decade – and certainly still not in its full potential universality – that in such intertemporal equilibria, the own interest rates adapt to one another when the time horizon moves toward infinity. In this way, a permanent stationary state will finally be achieved.²⁷ To assume an infinite time horizon is reasonable to the degree that with foresight, each time period raises the question of which stock must be planned to be made available in the next period, in order to prepare for a more distant future, so that each finite period induces its transgression.

This raises the very difficult question, forced by extending Böhm-Bawerk's approach, of how consumers are supposed to express their preferences over an infinitely distant future. Assuming a time preference is practically unavoidable here, since if I endow products with a positive utility and look forward into an infinite future, utility becomes infinite when simply added up, and I cannot compare various future consumption paths.²⁸ By contrast, if utility is discounted, the underestimation of the future leads to the possibility of assessing the consumption path extending into infinity with a finite utility, so that a comparison becomes possible.

In this modern extension, the question fiercely debated by Böhm-Bawerk and his contemporaries – whether an underestimation of the future can be assumed – is easily answered: Without underestimation, the future cannot be assessed at all. However, how the underestimation should be expressed is a very complicated question. Koopmans (1960), in particular, investigated this area in his work in the early sixties. The rate of time preference should not simply be exogenously prescribed, as happens in simplified models, because it must be determined at equilibrium. Epstein (1987) therefore suggested an axiom for calculating the

utility of such consumer paths extending into infinity, which was mathematically supported by topological methods; the rates of time preference of consumers become endogenous variables. Epstein manages to prove, using a model with a finite number of capital goods and a finite number of consumers, that under quite general conditions the system tends towards a stationary state qualified by a uniform rate of return on capital, which corresponds to a unified time preference rate of all consumers. This state is independent of how well provided the individual is with capital at the beginning and allows an endogenous determination of the time preference rates which become equal to the rate of interest. The capital stock which is available to consumers in this globally stable fixed state naturally depends on their individual preferences and is different for different individuals.

To this degree, it is possible, in this completely modern reformulation of the intertemporal theory established by Böhm-Bawerk, to determine the return on investment and the time preference rate simultaneously with an endogenous model for a stationary system that can be viewed as a stable goal from any starting point. Epstein's construction presupposes, however, that reswitching and related capital theoretical effects are excluded.

Thus, in this model Böhm-Bawerk's unacceptable assumption of a capital stock set from the very beginning at a certain value of the national economy is overcome; nevertheless, in contrast to intertemporal models with a finite horizon, a unified return on investment is achieved, so that individual interest rates tally, and it is possible to speak of 'the' interest rate. However, Epstein completes his very difficult proof only under a proviso from capital theory which is closely related to the qualification that capital intensity falls with an increasing interest rate, and that the functional requirements of the Neoclassical full employment mechanism are fulfilled.

Research in the field of intertemporal capital theory is therefore by no means exhausted. Indeed, it has taken an interesting new direction in the last few years. A closed, almost obligatory form, such as those for models with finite horizons from Debreu, has not yet been found for models with infinite horizons. In summary, we can conclude that Böhm-Bawerk gave a decisive push forward to the development of Neoclassical – and, in particular, Austrian – theory, whose further development went to the heart of modern research.

Exactly because later developments split in different directions and are conceptually and formally difficult, it is very rewarding to read Böhm-Bawerk in the original, in order to understand the essential and basically simple hypotheses which his successors have never overturned but merely modified. Although Böhm-Bawerk eschewed historical, sociological, and political questions in favour of the most resolute formulation of a theory, he was recognizably well-versed in all these fields, and his conception of the interconnected nature of economy and society is clearly recognizable. This vision is just sometimes quite difficult to find in the great variety of the sometimes polemical *Exkurse* woven into later editions of his works, which he thought necessary for the defence of his central concepts.

Irving Fisher's *The Nature of Capital and Income*

By the end of the Second World War, at the very latest, the United States had assumed a stance of global economic supremacy. In the majority of areas, technological superiority corresponded to scientific primacy. Only in specific fields do American universities find it necessary to follow new publications in French, German, or Italian and to take account of the research conducted in languages which – combined with Latin and Greek – had formed the European canon of language during the eighteenth and nineteenth centuries.

Shortly before the end of the nineteenth century, the United States had joined the ranks of the great powers with its victory over Spain in the Cuban war. The dynamic of economic growth, the inventiveness of technicians, and even American science gradually began to command Europe's respect. An upheaval in ways of thinking and living was here beginning, which would increasingly determine the character of modern development in the twentieth century. European ideas about education and artistic forms of expression which American students brought back from European universities and academies came to conflict with 'the American way of life'.

Institutionalism, related to and connected with the German Historical School, was one of the strongest tendencies in the United States. Irving Fisher was prominent among those who rejected this trend, placing theoretical and applied economics resolutely on a quantitative basis and thus establishing the modern form of economics.

Some view the victory which theoretical economics achieved at the beginning of the twentieth century to be too complete. I regret that despite such an extended period of study, many German students no longer receive any introduction to the methods and procedures of the humanities; often, they also lack the linguistic and cultural-historical background which is indispensable for understanding the particular economic organization of specific countries and eras. However, even in America, an older generation remains aware that there was a price to be paid for the development of modern theory and related fields of economics; that, in accord with the law of creative destruction, space first of all had to be created for them. Fisher himself symbolised the transition by becoming president of the American Economic Association in 1918, when Ely and other founder members who had studied in Germany still controlled it, and embodied the connection between American Institutionalism and the German Historical School.

Although Fisher was very versatile and also had literary interests, he was primarily inclined to a natural scientific and technical way of thinking. He had an excellent knowledge of mathematics and physics, which he cultivated his entire life – even in advanced age, he discussed the Theory of Relativity with Einstein. In his well-known dissertation from 1892 (*Mathematical Investigations in the Theory of Value and Prices*), he hit upon the original idea of representing the magnitudes of a general equilibrium, hence quantities, prices, marginal utilities, and so on, for different producers and consumers in an apparatus which functioned as a kind of analogue computer involving the basic laws of economic life: the balance

of marginal utility for each consumer, the level of the uniform prices for each product, the correspondence of marginal utility to prices, and all other relevant magnitudes.

Fisher was confident enough in himself to pursue unconventional, occasionally even somewhat whimsical, goals rooted in his background, his environment, and the originality of his mind. He published books on health which ran into numerous editions, he wrote many texts against alcoholism, and he embarked on lecture tours, which provided him with material relevant to a healthy way of life. He made technical inventions, was an early fighter for the cause of international understanding, drafted currency reforms, and earned so much money with all of this that he could hire many employees to disseminate these scientific or instructive texts. Future-oriented thinking and reformist zeal can also be traced in his most important scientific works.

In an essay on his life and work well worth of reading, Hans Monissen (1989) describes how Fisher, the son of a theologian and on the maternal side descended from an old American family, was as a student very short of money. He excelled as a mathematician, as a writer, in sports, and in public debates, until he finally received a scholarship for graduate study. He became a student of the physician J. W. Gibbs, still noted today in relation to the field of thermodynamics. On the advice of W. G. Sumner, Fisher turned from mathematics to economics; his dissertation, entitled *Mathematical Investigations in the Theory of Value and Prices* (1892), is a development, independent of Walras, of general equilibrium theory, generalizing the works of Jevons (1870 [1871]) and of Auspitz and Lieben (1889).²⁹ The text is interesting not only for the methodical construction of a system of equations for a general equilibrium and its analogous representation as a viable technical apparatus, but it is also interesting for inaugurating the separation of utility theory from a hedonistic calculus. From the very beginning, Fisher refused to base demand theory on psychological foundations.

Investigations brought him immediate international fame. He then began a brilliant academic career at Yale – interrupted by a three-year bout of tuberculosis – and as a scholar, he pursued, on one hand, capital and interest theory and, on the other, monetary and trade cycle theory. In so doing, he naturally explored various related areas and, for example, outlined a system for the taxation of consumption.

If we explore what Fisher considered his central questions, the unified nature of his entire work can be discerned, despite the variety of topics. A consistent feature was his efforts to develop clear categories for measurement and thereby render theory capable of application. Fisher was virtually a pioneer in the construction of an index for the purchasing power of money. His quantity theoretic interpretation of the exchange equation was consistent with his effort to trace the phenomenon of interest back to real economic causes. Right at the beginning of his chief theoretical work (Fisher 1907), he criticised a prejudice he attributed to business people, namely, that a plentiful money supply brought down the interest rate; rather, the quantity of money primarily affected prices.³⁰ The analytical distinction between the impact of an increase in the quantity of money upon the rate of inflation and on the monetary rate of interest was first made by Keynes,

although it is debatable to what degree Fisher's equation and Marshall's consideration of the holding of cash balances by economic subjects prepared the way for this step. Independently of Keynes, Kalecki had already made the total rate of money circulation, as a means of purchase, payment, and store of value, into a function of the interest rate.

Another connection between apparently discrete objects of research is to be found in taxation. Fisher is an important link in the long chain of authors who have come out in favour of an expenditure tax, who wanted to charge consumers according to their use of resources and not according to their income or their contribution. More recently, Kaldor (1955) has advocated an expenditure tax, listing Fisher as a predecessor, alongside Hobbes, John Stuart Mill, Marshall, and Pigou, as well as Einaudi (*ibid.*, p. 11). This corresponded to Fisher's utilitarian conception of designating what has actually been consumed as the real income, whose objective basis is constituted by a stream of consumer goods. The capitalization of this income represents the value of the means of production employed broadly understood (also including the capitalization of land values and highly skilled and specialised labour), which makes consumption possible. Theoretically speaking, in this conception savings are imputed to capital formation and so – deviating from normal usage – not a part of income.

From the perspective of welfare economics, many authors consider it wrong if the returns on saved income, which has already been taxed, are then once more taxed. With an expenditure tax, a criterion different to that used in the taxation of income is applied: according to Fisher, income from profits and other sources of income should not be considered income, when it is saved, and the tax is levied only on expenditures made for purposes of consumption. A consumption tax of this kind should promote saving and falls on consumption financed from wealth. Whether the taxation of income with the dual taxation of savings (for the formation of capital and of the returns) is in every theoretical respect inferior to an expenditure tax, which is in practice more difficult to realize but which avoids this double taxation, remained a matter of debate after Kaldor. One difficulty for finance policy that emerges in the transition to an expenditure tax is that marginal tax rates must be significantly increased.

For Fisher, it was both a principle and a practical problem. The principal problem of conceptual demarcation had already been addressed in *The Nature of Capital and Income* and resolved. In 1942, he returned to the question of an expenditure tax when he saw renewed possibilities for its realization (Fisher and Fisher 1942; Kaldor 1955, ch. 7). Fisher now showed that the taxation of consumption need not rest on an impossible inventory of consumer expenditures made by taxpayers, but that it would, for the most part, be sufficient to know what the changes in the asset position and the income (as usually understood) of an individual were within a given tax period, from which the differential of consumption spending could be calculated and taxed.

The Nature of Capital and Income constitutes the key to Fisher's oeuvre. In this work, he attempts to define the basic terms of his scientific system in such a way that they are theoretically focused, open to thought experiments, and capable of

measurable application. Whoever has had anything to do with physicists knows that they devote a great deal of care to the accurate determination of the dimensions of all occurring quantities and examine each formula to, first of all, see if at least its dimensions are correct. Fisher's extension of Böhm-Bawerk's interest theory begins with the notion of intertemporal exchange. Physically homogeneous products are at given dates related to their availability, so that with the promise of a delivery of corn tomorrow in exchange for corn today, a corn rate of interest is formed in exactly the same way that a promise of money tomorrow for money today forms a prospective rate of interest. Fisher had already remarked in the text *Appreciation and Interest* (1896) that interest on capital and monetary interest were different not only as a result of the different degrees of attendant risks, but also because money can both appreciate and depreciate. However, a third element is that in an intertemporal exchange, each standard leads to a different interest rate:

The rate of interest is, as Prof. Böhm-Bawerk shows, an agio on present goods exchanged for future goods of the same kind. It is a simple corollary of this theorem, though Prof. Böhm-Bawerk does not express it, that this agio may be in theory and must be in practice a different agio for every separate kind of goods.

(Ibid., p. 90)

The variety of interest rates implies a deferment of relative prices, in a generalization of the simplest case of an increase or a decrease in the value of all products relative to money, which for Fisher leads to the differentiation of nominal from real interest.³¹ In my essay on Böhm-Bawerk's *Positive Theory of Capital*, I have already pointed out why he makes all interest rates, which we would today call own rates of interest, equal in his stationary system by assuming constant relative prices – this is the condition for equilibrium – and we will have to think about why Fisher proceeds differently.³² Reaching back to *Appreciation and Interest* in this way shows how Fisher's natural scientific training and his related dimensional perspective made it difficult for him to adopt the accepted idea of *one* single rate of interest.

The Nature of Capital and Income apparently begins quite traditionally with the concept of wealth. It is broadly defined. Wealth is made up of the material objects which are owned, to which can be added land and labour power, although only the free possess their own labour power, since a slave is the property of someone else. The discussion at the end of the first chapter sounds like an echo of the American Civil War, with a calculation of the value of people (each for himself/herself or for others or according to the ability of a population to create income), which is provocative.

The second chapter addresses what seems to be quite a modern theme: property rights, endeavouring to trace them all back to property titles. What is usually referred to as intangible wealth is here understood as the servicing of material wealth. The method may appear forced, but it increases the coherence of Fisher's system.

In chapter four, he arrives at a sharp distinction between stocks and flows. A level of wealth existing at one particular moment is called capital. A flow of services during a period is a form of income. This disjunction could be compared to other approaches. When raw material or fuel is consumed in the production process, a service rendered by capital not only appears as a flow, but it is a flow of capital goods, which makes it possible to create a flow of output goods. The Classical economists, therefore, tended to treat capital as a joint product, just as Neumann began to treat it once again in the twentieth century. At the beginning of each period, capital goods enter into production. At the end of the period, durable goods leave the process in altered form, and depreciation is the difference in value between the new machine and the one-year-old machine. Depreciation can then be understood as the consumption of value, which is analogous to the consumption of raw materials and fuel. Taking into account this long-forgotten interpretation, the accusation of obscurity and inconsistency which Fisher levels against Classical authors is not always justified. Consumption of value and circulating capital are also streams. The consistency of Fisher's own definition remains untouched.

After an important exposition of the concrete aggregation of capital value, Fisher comes to his insistent plea that the concept of income be limited to consumption. Otherwise, how can such sporadically occurring revenues as legacies or lottery winnings be differentiated according to whether income or assets have increased? For Fisher, it is clear that inherited wealth is only a title to future income.

For Fisher, the important thing is to avoid double counting and the confusion between income and capital. Income is therefore a very general concept: 'It consists of services rendered by capital' (Fisher 1991 [1906], p. 118). It is assumed that people can also be considered capital. The consideration of capital showed that in the aggregate, titles to debt balance each other out. For income, it is shown that the net income of fictitious persons is excluded, since they do not consume. What a natural person earns is initially an increase in assets. What this person uses from this for consumption is his or her income. Consumer goods acquired in this manner ultimately generate psychic income, a 'stream of consciousness,' which is what Fisher is really interested in. His quite thorough discussion of the Paradox of Desirability and the lack of enjoyment of some forms of consumption (Fisher's example is pain at the dentist's) is reminiscent of his interest in health issues manifested in some of his other writings.

The following chapters could be interpreted as laying the basis for his interest theory. Once again, he begins with a differentiation of dimensions – in this case, capital productivity – which he distinguishes according to physical and relative value. He then explains the discounted future return as a capital value, and this aspect of the valuation is the only really important one. In his – very biased – history of economic thought, capital value was in Classical Theory determined by production costs, which are irrelevant for future-oriented decision-making when the discounted returns deviate from these costs. He goes so far as to completely disregard objective production costs for the economy as a whole (*ibid.*, p. 173), because what is a cost for one represents income for another. The cost of flour for

the baker is income for the miller, and wage costs for the business owner is income for many households. Only the latter incomes result in a satisfaction for individuals who have performed specific amounts of work. And for health reasons, 'superficially' objective income can deviate from subjective income.

Beyond this perhaps somewhat time-specific formulation, the question arises as to how the extremely important emphasis on a future-oriented capital concept might, for Fisher, sit with the determination of the rate of interest at equilibrium. In *The Nature of Capital and Income*, Fisher explains his basic ideas by treating the element of risk very innovatively. I do not wish to go into this explanation but instead want to concentrate on some aspects of the determination of interest at equilibrium, because Fisher offers a useful contrast to Böhm-Bawerk in respect of some interesting points.

Fisher's mathematical knowledge went far beyond that of Böhm-Bawerk. However, Böhm-Bawerk fought back using the logic he had acquired during his legal training, together with his knowledge of the history of economic thought. As a rule, for Fisher mathematical determination was already explanation enough. For Böhm-Bawerk, causality was important. He provides an example, aimed at Fisher:

If I know the capacity of a reservoir and the number of days that are required for filling it, I can compute the flow of the water supply. It is 'unequivocally determined' by the given data. The magnitude of the cause is clearly determined by the data on this effect. Inversely, if flow of the water supply and the filling time are given, I can compute the capacity of the reservoir, that is, I can compute the magnitude of effect from that of its cause. Mathematically determination is neutral with regard to the question of causality . . .

(Böhm-Bawerk 1959, p. 191)

In economics as a science of human action, causality has to be read out of the effect of the constantly changing activities of economic subjects. Therefore, it is not enough to prove, for example, the existence of a full employment equilibrium; what is important is to demonstrate how during periods of change, perhaps an influx of workers, it nevertheless proves stable. The whole chain of actions – and Böhm-Bawerk proceeds in this way in the final part of his main work – must be traced if the full employment equilibrium is disturbed in this way.

Fisher had no reason in his 1907 theory of interest to polemicize against his principal forerunner, since there was little difference between his theory and that of Böhm-Bawerk. He recognized Böhm-Bawerk and John Rae to be precursors of his own ideas. In the introduction, he goes into a specifically American development, the productivity theory of interest, advocated primarily by Henry George and which refers to the growth potential of nature: of forests, animals, and so forth. Fisher objected that the rate at which managed forests or herds enlarged or increased, however, depends, as far as they are concerned, on the rate of interest, because investments are made in agriculture according to specific future plans: the rate of interest is not determined by the rate of growth, but the other way around. The rates of reproduction existing in the nature world, so far as they are given,

limit the choices available to investors and to that degree exert an influence on the interest rate (Fisher 1907, p. 28). It could be added that with a given technology and constant returns, the growth rate of the system as a whole also sets an upper limit for the interest rate, according to the rate of reproduction in the von Neumann Model, or the maximum profit rate in a Sraffa System.

Marx indirectly pointed to the existence of an upper limit for the rate of interest or of profit for a given technology; however, Fisher and Böhm-Bawerk appear to have remained unaware of both this theoretical sketch and its substance.³³ But it is still of interest that Fisher implicitly raises this point in a partial critique of Böhm-Bawerk when he asks whether the series always converges, through which Böhm-Bawerk defined the production period in terms of dated labour inputs multiplied by the number of years since the labour was provided, divided by the entire time elapsed. This construction is similar to the so-called Reduction of Prices to dated Labour Inputs which Adam Smith had already noted, and the question had always been the extent to which a labour input which lay far in the past, chronologically, and which had entered indirectly into present assets could be neglected in the final summation. There are two opposing tendencies to consider here. A labour input from the distant past is factored into the costs of a product available today and given only a small weight, because the amount of labour is small. If a tree was planted a hundred years ago, which was used fifty years ago to produce an axe, with which a chair was produced twenty years ago, upon which a tailor sits today sewing a dress, the original labour input is clearly only a very small part of the work that goes into the production of the dress. However, this labour input is included, conversely, with an important weight in the costs, when the time span is long and the interest rate r is positive. The factor amounts to $(1+r)^{100}$.

In modern terminology, the facts of the case are easy to represent in a clear fashion. When \mathbf{A} represents an input-output matrix and \mathbf{l} the associated labour vector of a particular system, then \mathbf{l} is the labour expenditure of the current year, $\mathbf{A}\mathbf{l}$ is labour of the year before to the degree that it went into a product that was produced today, and $\mathbf{A}^2\mathbf{l}$ is the labour expenditure of two years ago which goes into the product today. With a wage rate w , the vector of the product price \mathbf{p} is determined³⁴ by the series

$$\mathbf{p} / w = \mathbf{l} + (1+r)\mathbf{A}\mathbf{l} + (1+r)^2 \mathbf{A}^2\mathbf{l} + \dots \quad (1)$$

We know that this series converges only for a positive r , when r is smaller than the maximum profit rate R . When r is varied for a particular system, the small r also signifies low prices in wage units (the net product can for the most part be sold from the wages), while with r rising against R , the rising prices in wage units expresses the absorption of the net product from profit income. In the transition from r to R , the series (1) diverges.

Irving Fisher takes up the question of convergence in connection with Böhm-Bawerk's definition of the average production period. In this equation, the interest rate is still not included, since it first has to be determined with the help of the

equation (Böhm-Bawerk 1961, vol. II/2, p. 71).³⁵ When the activity level of our system is described by a vector \mathbf{x} , the average production period of the whole system could be defined, taking into account the expression of labour lying 'far in the remote past:

$$T = \frac{0\mathbf{x}\mathbf{l} + 1\mathbf{x}\mathbf{A}\mathbf{l} + 2\mathbf{x}\mathbf{A}^2\mathbf{l} + 3\mathbf{x}\mathbf{A}^3\mathbf{l} + \dots}{\mathbf{x}\mathbf{l} + \mathbf{x}\mathbf{A}\mathbf{l} + \mathbf{x}\mathbf{A}^2\mathbf{l} + \mathbf{x}\mathbf{A}^3\mathbf{l} + \dots} \quad (\text{II})$$

Now it turns out that the production period can be precisely defined by (II) when R is positive.³⁶ In fact, for a system in so-called standard proportions (corresponding to balanced growth), even a real correspondence of the three variables – production periods, capital coefficient, and inverse maximum profit rate – is obtained.

In order to prove this, one requires converging power series for $|x| < 1$

$$(1 - x)^{-1} = 1 + x + x^2 + \dots$$

and

$$x(1 - x)^{-2} = x + 2x^2 + 3x^3 + \dots,$$

which are easy to derive. Standard proportions are assumed when the production level \mathbf{q} fulfills the equation $(1 + R)\mathbf{q}\mathbf{A} = \mathbf{q}$. Formula (II) then yields (dividing by $\mathbf{q}\mathbf{l}$):

$$\begin{aligned} T &= \frac{\mathbf{q}\mathbf{A}\mathbf{l} + 2\mathbf{q}\mathbf{A}^2\mathbf{l} + 3\mathbf{q}\mathbf{A}^3\mathbf{l} + \dots}{\mathbf{q}\mathbf{l} + \mathbf{q}\mathbf{A}\mathbf{l} + \mathbf{q}\mathbf{A}^2\mathbf{l} + \dots} \\ &= \frac{(1 + R)^{-1} + 2(1 + R)^{-2} + 3(1 + R)^{-3} + \dots}{1 + (1 + R)^{-1} + 2(1 + R)^{-2} + \dots} \\ &= \frac{(1 + R)^{-1} + [1 - (1 + R)^{-1}]^{-2}}{[1 - (1 + R)^{-1}]^{-1}} = 1/R \end{aligned}$$

For the capital coefficient, we obtain the same thing:

$$K/Y = \frac{\mathbf{q}\mathbf{A}\mathbf{p}}{\mathbf{q}(\mathbf{I} - \mathbf{A})\mathbf{p}} = \frac{(1 + R)^{-1}\mathbf{q}\mathbf{p}}{R(1 + R)^{-1}\mathbf{q}\mathbf{p}} = 1/R.$$

Thus, the question of the existence of a maximum profit rate is implicitly raised by Fisher's question about the convergence of the series, in the numerator and the denominator from (II), which define the production period.³⁷ Böhm-Bawerk is here proved correct, insofar as systems which generate a net product (and only such systems make sense economically) also have a positive maximum profit rate and thus a production period defined according to (II). However, Fisher shows in the appendix to his book (Fisher 1907, p. 352) that the production period can still be no meaningful measure for determining the interest rate, if the dated inputs or outputs are distributed very unequally over time.

It has to be imagined in this regard that for each given technology, the profit rate or the interest rate can lie in a complete interval, specifically between zero and the maximum profit rate associated with this technology. When there is an entire spectrum of technologies ($\mathbf{A}^{(i)}, \mathbf{I}^{(i)}$; $i = 1, \dots, s$) to be chosen from, for each given r the choice of a precisely determined technology will be cost-optimal. In modern terms, Böhm-Bawerk's notion was that each of these technologies can, at a given activity level, initially be associated with a production period $T(i)$ according to formula (II) – as we saw this is possible, and that second, at lower rates of interest, a technology i with a longer production period $T(i)$, corresponding to a greater capital intensity would be chosen than the technology which would be chosen during times of higher interest rates. The specific production period, in each case with the prevailing technology, should thus become an indicator of the predominant interest rate. It is thanks to Fisher that this latter assertion was refuted.

Characteristically, Fisher did not look backwards, as with the reduction according to formula (I), but forwards in time. In the example mentioned, he therefore assumes that a particular use of a labour unit yields \$5 in ten years and \$100 in a hundred years, while another use of this labour yields only \$15 once in twenty-five years.

In this case it becomes impossible to call one of the production periods longer than the other; . . . it is not true that one of the alternatives will be chosen if the rate of interest is high, and the other if the rate of interest is low, as would be the case if they were subject to Böhm-Bawerk's series. The application of labour which issues in the \$5 and \$100 would, oddly enough, be the most economical if the rate of interest were either very high or very low, whereas the other alternative would be chosen in the case the interest were at a more moderate rate.

(Ibid., p. 352)

Fisher's example, here, seems very similar to Sraffa's example of wine and oak chests, which was discussed in my essay on Böhm-Bawerk.³⁸ For us, examples of this type are the easiest way to prove reswitching and thus to question the existence of a production period which could explain the level of the interest rate or refute the universal validity of the existence of an inverse relationship between the interest rate and capital intensity. However, the importance of new discussions of capital theory is certainly based directly on the fact that the possible return to the same technology with various interest rates can be proved not only using partial analysis, as in the examples from Fisher or the wine and the oak chest, but also for the entire system ($\mathbf{A}^{(i)}, \mathbf{I}^{(i)}$).

Thus, we recognize how close the authors at the turn to the twentieth century came to the key concepts of maximum profit rate, reduction to dated labour, or return of technology, as if they were groping around in the corridors of a dark building, and yet we can also see just how far away they still were from understanding the connection of these terms, because they did not understand a given technology as an entire, self-reproducing system, as became evident with von

Neumann and Sraffa.³⁹ Their models have thrown an entirely new and keen light on the discussion of capital theory, so that the outline of the building which earlier was only felt in the dark now lies open before our eyes.⁴⁰

Among Fisher's most important innovations and one which was also highly admired by Böhm-Bawerk is the briefly mentioned connection between the monetary and the real interest rate of interest through monetary depreciation. The connection with own rates of interest of various goods can be most easily introduced if, instead of considering heterogeneous goods with diverging own rates of interest in the realm of products, we think of various currencies. If the mark and the dollar have a specific exchange rate today, but the rate of interest for the dollar is higher than that for the mark, the forward exchange rate must express an expected revaluation, because arbitrage today will ensure, even with major fluctuations in the rate, that at any moment the interest expressed in mark and the dollar interest expressed in mark correspond very precisely with the hedging of a futures trade.

Fisher had already postulated an analogous connection between gold money and a product (wheat) in his *Appreciation and Interest* (Fisher 1896, p. 8 sq), when a particular upward-revaluation or devaluation of gold is expected. It is quite clear that when i stands for the monetary interest rate, r for the own rate of interest of a product (gold), and d the rate of the price change (e.g. rate of inflation), the relationship below must be valid

$$1 + i = (1 + r)(1 + d) = 1 + r + d + rd$$

so that in the first approximation (r and d small quantities)

$$i = r + d$$

is valid: the monetary rate of interest is not equal to real rate, but equal to the real rate plus the rate of inflation.⁴¹

Although there were forerunners to Fisher in this, we associate it with him because of the brilliant use to which he put it. As already mentioned, he may have pointed out that in principle, there are as many real interest rates as there are goods (or baskets of goods) which could be defined. However, the thoughts that follow are for the most part based on the assumption that a real rate of interest, based on the creation of an index, and a monetary rate of interest could be opposed to each other. Thus, it appears to be not so much the capital theoretical issues related to intertemporal equilibrium theory which led Fisher to the observation of divergent own rates of interest, but the search for an explanation of the connection between interest as a monetary and interest as a real economic phenomenon.

For a one-product-world, it is possible to represent the intertemporal equilibrium with the well-known diagram that can be traced back to Fisher, which is found today in all textbooks. A transformation curve shows the possibilities of having more products in the future at the cost of a decreasing availability of products in the present. The rate of transformation is then in equilibrium the

same as the (intertemporal) marginal rate of substitution, and the former cannot be smaller than one, when it is a question of a storable product without costs.⁴² Together, they determine the rate of interest. The intertemporal marginal rate of substitution on the 45° line, decreased by one, is usually designated as the rate of time preference, for which present and future consumption are of equal volume.

However, in a general intertemporal equilibrium with many products and a model of a finite time period, which was made famous by Arrow and Debreu, the relative prices change from period to period, so that own rates of interest are different (as Fisher had already pointed out in *Appreciation and Interest*). Fisher did not entirely formulate this complete system. Milgate (1982, p. 133) attributed precedence to Hayek in the construction of the Intertemporal equilibrium theory, and Malinvaud presumably took up this thought in 1953, which then led to Arrow-Debreu.

In the debate between Hayek and Sraffa, the latter in 1932 understood the differences of own rates of interest, which he discovered in Hayek's conception to be an expression of a disequilibrium. Modern theoretical development agrees with him to the extent that the variety of own rates of interest disappears in the Neoclassical framework, when under appropriate conditions the time horizon is extended toward infinity. For the differences in the own rates of interest arise from the arbitrariness of the given initial endowments, which are either plentiful or scarce, relative to the demands of the economic subject (indirect, when it is the means of production; direct, when it is a question of consumer goods), so that at the beginning there are shortage prices, which are high, due to the limited amounts available in the opening inventory (relative to the demand), while prices are low for those goods which are available in abundance. With perfect foresight, production will gradually adapt to demand, assumed to be stationary, and thus give rise to the possibility that the own rates of interest will adjust to one another and the relative prices will similarly converge with a particular vector, which corresponds to an asymptotically attainable stationary equilibrium.⁴³ Sraffa interpreted the initial situation, with diverging own rates of interest, as a deviation from a long-term equilibrium. Hayek, however, understood the variety of own rates of interest as an expression of an intertemporal equilibrium with a finite time horizon, which is usual today.⁴⁴

Samuelson regarded Fisher's intertemporal theory as a contribution toward the construction of a general equilibrium more positively than did Milgate.⁴⁵ In his *Theory of Interest*, Fisher (1930, ch. 10 and 11) openly launches into the main topic, assuming a transformation curve which represents the income flow of an individual in the present and the future. This curve then allows a balance between individuals with various preferences, which is, however, worked out from the point of view of partial analysis, since it does not produce a comprehensive treatment of the interdependence of various markets.

Böhm-Bawerk had already objected that in the earlier book, the error of partial-analytic thinking must be apparent from the fact that a fall in the interest rate does not, as Fisher claims, necessarily result in an increase in all capital values, although it is, of course, correct that the discounting of a given income flow, from

the perspective of partial analysis, implies a higher capital value, the lower the interest rate is. The partial-analytical consideration is indeed inadmissible because interest rates do not simply regulate capitalization – they also influence costs. It is insignificant for theoretical observation that past costs are irrelevant for decisions about investments in the real world, because they are based upon different conditions of production (a different technology) than production in the future. Nevertheless equilibrium prices, which will determine production in the future, must reflect the costs which correspond to the future technology.

Böhm-Bawerk (1961, vol. II/2, p. 112) compares Fisher's mistake with the erroneous notion already criticised by Mill that with an increase in wages, the real price of all goods could increase.⁴⁶ As Fisher says in Böhm-Bawerk's translation, when the 'effective future output' remains 'unchanged' [*künftige Nutzleistungen unverändert bleiben*], we could interpret the question such that in a system with a particular technology, with fixed capital, the interest rate or the profit rate will sink. A specific production process might assume the following form:

$$(1+r)(\mathbf{a}_1\mathbf{p} + M_0p_{m0}) + wl_1 = p_1 + M_1p_{m1},$$

where \mathbf{a}_1 designates a vector of raw materials, \mathbf{p} the corresponding price vector, p_1 the price of the manufactured good in this process, M_0 and M_1 a new and a one-year-old machine, with p_{m0} and p_{m1} as the corresponding prices, and l_1 as the labour input for the process. Now if all raw materials, consumer goods, or new machines are produced by such processes, while old machines result from them as joint products, and if ultimately each machine has for technical reasons a finite life, while their economic life is determined by cost minimization, then it can be shown that for all rates of profit between 0 and a maximum, there are positive prices.

Hence, at least the prices of new machines appear to be determined by production costs. However, the system can also be reorganized such that the price of each machine is equal to the net returns discounted by r . The following equation can then be written for the new machine

$$M_0p_{m0} = [1/(1+r)]\{p_1 + M_1p_{m1} - wl_1 - (1+r)\mathbf{a}_1\mathbf{p}\}$$

which states that the value of the machine is equal to its discounted return for the following year. The returns from future years can also be included, if older machines are recursively eliminated from the equation and the related future net returns are discounted by the corresponding powers of $1/(1+r)$.⁴⁷ If, in this discount formula, the profit rate in the denominator on the right-hand side is increased, while the price and rate of profit in the numerator are arbitrarily kept the same, the result is that there is a decrease in capital value with an increasing discount factor. However, for the comparison of equilibria, the profit rate is assumed to be uniform and all prices must, accordingly, change simultaneously. Then it can be shown that – since with a falling profit rate, prices may also fall – a decrease in the profit rate or in the interest rate can sometimes lead to increasing

and sometimes to decreasing prices, just as Böhm-Bawerk had objected to Fisher. If wage units p/w are selected as a *numéraire*, with a decrease in r , at least the price of every new machine will also fall (Schefold 1980, p. 161). It is quite evident: each investor expects that falling interest will lead to rising capital values and property values. But if the rate of interest constantly falls, the prices of goods produced with capital also fall, together with rents and so forth, so that in the long term, the effect on capital goods and property prices can move in both directions.

Although Fisher first made his name with the representation of a (static) general equilibrium system, and although he also introduced the diagram upon which the basic representation of Intertemporal equilibrium theory today is based, his chief merit does not lie in this area at all. The significance of his theory of interest, as mapped out in *The Nature of Capital and Income*, is that it moves from the development of theoretical terminology to the deployment of this terminology. Thanks to its connection with monetary theory, his interest theory had a beneficial effect. Keynes implemented his definition of rate of return using the term 'marginal efficiency of capital'. And with his emphasis on determining capital value by means of discounting returns, Fisher took an important step toward freeing economic theory from equilibrium analysis and directed attention to the necessity of also investigating imbalances, or, better yet, equilibria which do not simultaneously fulfil all the conditions for a long-term equilibrium and thus contributed to a better understanding of economic dynamics.

His definitions of the rate of return and the future-oriented use which he made of them cannot here be further discussed. They, too, have generated controversies (Pasinetti 1969). Equilibrium theory, of particular interest to me in respect of the confrontation between Classical and Neoclassical conceptions, implies a narrowed viewpoint when compared with Fisher's versatility. Thus, Fisher also showed less interest in the macroeconomic aspects of distribution and employment theory than in their microeconomic aspects. Already in *The Theory of Interest*, he had turned expressly from functional income distribution to personal income distribution. Among Fisher's merits not referred to here but listed by Monissen, we could also mention that he provided a closed conceptual framework for the solution of fundamental theoretical problems of capital markets by dealing with the time structure of interest rates, as well as with expected and unexpected price changes with their effects upon interest. All of this he verified statistically. In the field of monetary theory, Monissen has pointed to the significance of the analyses of transitional periods in disequilibrium, in which incomes, employment, and velocities of circulation are variable.

We could go on and on. The wealth of his ideas could be further illustrated by the diversity of references by modern theory to Fisher. It can always be demonstrated that his practical thought and representational style prefigures modern American economics. Fisher left behind no synthesis, and his suggestions have been taken up in so many different ways that nobody else will be able to provide one either. *The Nature of Capital and Income* is a work in which Fisher's most important interests are addressed, it is a work which has a definitive character, and at the same time it is a work which, in one respect, the definition of terms for capital and income is remarkably original.

Irving Fisher's determination of interest and long-term equilibrium

While Irving Fisher's *The Nature of Capital and Income* refines the definitions of capital and income, his theory of the determination of the interest rate is found in *The Rate of Interest* – an enormously innovative book, which is still cited in textbooks, since this is where the famous diagram for the derivation of interest from intertemporal utility curves and transformation curves can first be found. The term 'time preference' was also first described here with remarkable clarity, both in its economic logic and in its unexpected historical and sociological aspects. Among the important extensions of this can be included Fisher's explanation in 1896 of the connection between interest rates and expected changes in the value of money, as well some noteworthy appendices on capital theory, which I have already explored in my essay on Fisher's *The Nature of Capital and Income*.

Years after *The Rate of Interest* was published, I suggested the more popular term 'impatience' in place of 'agio' or 'time preference'. This catchword has been widely adopted, and, to my surprise, has led to a widespread but false impression that I had overlooked or neglected the productivity or investment opportunity side entirely.

(Fisher 1930, p. VIII)

It is indisputable that in 1907, Fisher had already included investment in his analysis. The subjective moment, however, is emphasized insofar as the choice of the more productive manufacturing processes is not represented as a technical necessity but as something which itself is influenced by time preference:

That long processes (assuming their length to be measurable) are more productive than short processes is, as Böhm-Bawerk says, a general fact, not a necessary truth. The reason lies in *selection*. It is not true that, of all *possible* productive processes, the longest are the most productive; but it is true that, of all productive processes *actually employed*, the longest are also the most productive.

(Fisher 1907, p. 353)

Indeed, when choosing between two equally productive processes of different duration, the shorter will always be chosen; to that extent, time preference seems to be dominant, as Böhm-Bawerk indicates.⁴⁸ This leads to the particular formulation of the analytical problem of optimal choice of technique, and this apparent dominance is reinforced by Fisher's chapter 15 on 'inductive verification (economic)'. This chapter presents a historical comparison of the fates of entire populations, with their time preference, their willingness to save, and their capacity to accumulate. There is no shortage of qualifications relating to the danger of such generalizations, to other factors such as poverty and distribution, and to the methodological problem of inductive reasoning; all of this is given greater weight in the 1930 edition, where the chapter is now more cautiously entitled 'Some illustrative facts' (Fisher 1930, ch. 18).

The treatment of the dispute over the supposed priority given subjective elements purely in logical terms can seem like splitting hairs. However, it is generally the nature of Austrian theory to see in social time preference the key variable for understanding the growth of an economy, which, for example, could be contrasted with the Keynesian notion of the ‘animal spirits’ of the business entrepreneur as a determining factor in the investment process. In this general respect, Fisher can be included among the Austrians, and viewed in this light, the subjective side was more strongly emphasized in 1907 than in 1930.

We can really only talk about a societal time preference because individual rates adjust to one another by means of the interest rate; Fisher’s third reason for the determination of monetary rate of interest concerns ‘... the tendency of the rates of time-preference for different individuals to become equal to each other and to the rate of interest, through the loan market, or through buying and selling property’ (Fisher 1907, p. 328).

One of the problems to be solved here is the identification of the rate of interest through which this adjustment occurs. Fisher is apparently thinking of the monetary interest rate. Certainly, one of his primary merits consists in just this proof, that for each product a particular rate of interest, an own rate of interest, can be set: ‘There are therefore just as many rates of interest in goods as there are forms of goods diverging in value’ (ibid., p. 84). Which rate of interest is the ‘correct one’? Fisher solves this predicament by making the monetary rate of interest an objective, institutionally specified datum, without any further explanation of the kind that Keynes attempted with liquidity preference (which, of course, opposes Fisher’s quantity theory).

From this explanation it is very evident that if we seek to postulate an absolute standard of value in which the rates of interest are to be reckoned, we cannot fix one which will be uniform for all the individuals in the market. Supply and demand operate only to make *objective* rates equal. Hereafter we shall confine ourselves to a study of objective interest; and since the objective standard usually employed is money, the rate of interest, unless otherwise specified, will be taken in this book to mean the rate of interest in terms of the money standard. (Ibid., p. 86)

Why is a particular good transformed into money? There is a theoretical way of avoiding having to answer the question: in an intertemporal equilibrium, the own rates of interest converge (given the appropriate conditions) on a general rate, as will be shown shortly. In the long term, it clearly does not matter which own rate of interest for a particular product market participants orient themselves toward.

Given that $\mathbf{a}_{k,t}$ is the input vector for period t in process k and $\mathbf{b}_{k,t+1}$ is the vector of outputs in the same process which are produced in the following period, the of the intertemporal equilibrium for the discounted prices in the present are \mathbf{p}_t and \mathbf{p}_{t+1} . With constant returns to scale and perfect competition, the following results:

$$\mathbf{a}_{k,t}\mathbf{p}_t = \mathbf{b}_{k,t+1}\mathbf{p}_{t+1}.$$

Vector \mathbf{s} is the *numéraire* – it can be a unit vector for a *numéraire*-commodity, whose positive entry represents a unit of gold, for example. When interest is charged on gold at i_t^s in period t , the amount of gold \mathbf{s} in period t and the promise of a delivery of gold in the amount $(1 + i_t^s)\mathbf{s}$ in period $t + 1$, discounted for the present, are equivalent, thus

$$[(1 + i_t^s)\mathbf{s}]\mathbf{p}_{t+1} = \mathbf{s}\mathbf{p}_t.$$

The excess that is paid ‘tomorrow’ for a unit of gold ‘today’ is the own rate of interest for gold:

$$i_t^s = \mathbf{s}\mathbf{p}_t / \mathbf{s}\mathbf{p}_{t+1} - 1.$$

The own rate of interest is heavily dependent upon the levels of scarcity in intertemporal equilibrium. Usually, the price for a product promised for ‘tomorrow’ is lower than one that is available ‘today’; the own rate of interest is therefore positive. However, when there is an initially ample supply of this product, the prices must also at first be low and increase in the following periods as a result of consumption; if it cannot be stored without cost, then a negative own rate of interest is possible. Storage, which involves costs at a rate of z per unit and period, means that $1 - z$ units from \mathbf{s} in period t can be transferred to period $t + 1$; the own rate of interest, in any case, is greater or equal to $-z$, so that

$$(1 + i_t^s)\mathbf{s} \geq (1 - z)\mathbf{s},$$

is valid for the amount devoted to tomorrow for \mathbf{s} , since the lender would otherwise prefer to store the good himself.

It is not always known that the various production processes are equally profitable if the comparison is carried out in undiscounted prices \mathbf{p}_t^* , which are defined by the *numéraire* for every period:

$$\mathbf{p}_t^* = \mathbf{p}_t / \mathbf{s}\mathbf{p}_t.$$

With this definition, we can obtain from the first equation for production in discounted prices another in undiscounted prices:

$$\mathbf{a}_{k,t}\mathbf{p}_t^* (\mathbf{s}\mathbf{p}_t) = \mathbf{b}_{k,t+1}\mathbf{p}_{t+1}^* (\mathbf{s}\mathbf{p}_{t+1}),$$

therefore

$$(1 + i_t^s) \mathbf{a}_{k,t}\mathbf{p}_t^* = \mathbf{b}_{k,t+1}\mathbf{p}_{t+1}^*.$$

in which the profit rate is apparently the same for all processes, though dependent on the *numéraire* \mathbf{s} . When the interest rate of gold is 4 per cent, someone who has gold can accordingly receive 4 per cent by lending the gold or obtain the same interest rate by selling the gold, investing in another process, and then

finally selling the product for gold. If, at the same time, the own rate of interest for silver is 3 per cent, the same processes, with the same prices, will yield 3 per cent for silver. To which of these own rates of interest does the time preference adapt?

Fisher, first of all, takes an arbitrary monetary commodity. Ultimately, however, he follows the classical method that assumes own interest rates are equal, which is the case when non-discounted prices do not change over time. Input prices are then identical to output prices, and the following is valid for all active processes.

$$(1 + r)\mathbf{a}_k\mathbf{p} = \mathbf{b}_k\mathbf{p}.$$

The time index can be set aside, and thus a profit rate $r = i^s$ is found, which is uniform for all processes and at the same time corresponds with all own rates of interest.

In the case of single production without a choice of technique, it can be easily shown that a convergence of prices to the system

$$(1 + R)\mathbf{A}\mathbf{p} = \mathbf{p}.$$

(\mathbf{A} is the irreducible input-output matrix, R the profit rate) is implied in the intertemporal model, because in this case we obtain the system of equations

$$\mathbf{A}\mathbf{p}_t = \mathbf{p}_{t+1},$$

for the discounted price. Thus, when the intertemporal equilibrium begins with price \mathbf{p}_0 , it generates a series of falling prices with the powers of matrix \mathbf{A} (the series of \mathbf{A}^t converges to zero):

$$\mathbf{A}^t\mathbf{p}_0 = \mathbf{p}_t.$$

This means that the series $(1 + R)^t\mathbf{p}_t$ converges to \mathbf{p} (in each common *numéraire* for \mathbf{p}_0 and \mathbf{p}) holds true.⁴⁹ Thus the undiscounted \mathbf{p}_t^* automatically converge to \mathbf{p} normalized with \mathbf{s} , and i_t^s to R , and this for every \mathbf{s} .

And so the intertemporal equilibrium finally converges towards a long-term equilibrium. In our example, its rate of profit or its rate of interest is determined by the system's productivity (the dominant eigenvalue of matrix \mathbf{A}). However, when a choice of technique is permitted, R will become dependent upon this technique and the rate of time preference for ascertaining R in the prevailing equilibrium also plays a role.

From the standpoint of positive economics, the special character of this long-term equilibrium cannot be over-emphasized: the final state is defined by full employment and a determination of distribution by rates of time preference, though Classical and Keynesian authors have also acknowledged equilibria without full employment. Likewise, the process of approximating the long-term equilibrium position via intertemporal equilibrium is, compared with the variants of the gravitation processes discussed in Classical and Keynesian literature,

characterized by very restrictive assumptions (again full employment, no storage, and perfect foresight). Neoclassical Theory based on the intertemporal approach is of a special nature, while Classical Theory is not, even if the latter has still not received as thorough a mathematical treatment as the former.

But let us go back to the history of economic theory. Our examination makes possible a new connection with the discussion of capital theory. Fisher also noticed that the rate of interest influenced capital costs. He calls the interest rate 'almost omnipresent' (Fisher 1930, p. 278) in the determination of the 'opportunity line', which characterized technical alternatives. Fisher's highly original treatment of reswitching offers an answer to Böhm-Bawerk's production period and was essentially formulated in terms of partial analysis.⁵⁰ Reswitching, however, also represents a problem for intertemporal models, because the process disrupts the convergence toward a long-term equilibrium if the inverse relation between interest rate and capital intensity, which is normally assumed, does not exist (Schefold 1993b).

The interdependence of the valuation of capital and the rate of interest, an interdependence which creates difficulties for capital theory, is not, of course, of prime importance for Fisher. He primarily treated the value of capital as determined by discounting the expected returns. He differentiated his approach from that of Walras and Pareto as follows:

Walras and Pareto determine the rate of interest simultaneously with all the other unknowns of the problem – the quantities of the commodities exchanged and the services used in their production and the prices of the commodities and the services, while I try to isolate the interest problem by assuming that most of [sic] such unknowns have already been determined and confine my discussion to the special factors directly affecting the rate of interest.

(Fisher 1930, p. 519)⁵¹

Irving Fisher was remarkably successful in completing this programme.

Vilfredo Pareto's *Manual of Political Economy* [*Manuale di economia politica*]

By 1900, the age of generalist scholars seemed to have passed long before, and yet Vilfredo Pareto made an equally deep impression upon two related sciences, economics and sociology. His scholarly achievement is all the more astonishing because it was for the most part produced when he was more than 50 years old and was preceded by active engagement in business and governmental administration, together with active participation in national events. His work was solidly founded upon a wide-ranging education involving a thorough grounding in the ancient languages, an astonishingly broad reading of ancient literature, and his studies of the natural sciences at a technical university.

A theoretically trained economist who only knows of Pareto's influence from equilibrium analysis and his law on the distribution of wealth will be surprised by

the range of theoretical ideas to be found in Pareto's economic work, particularly in his *Manuale*, anticipating new theories developed in fields other than those usually associated with his name. Of no lesser interest are, however, some ideas advanced by Pareto which went down paths which modern theory has since abandoned, perhaps without ever realising quite where they might have led. Finally, the historian of economics sees in Pareto the joining together of many strands of thinking which are as intricate as the development of the Neoclassical world-view from its origins in Walras and the Austrians. Auspitz and Lieben, Fisher, Edgeworth, and Marshall were his immediate predecessors and contemporaries. We repeatedly encounter influences and borrowings which make it hard to establish intellectual priorities.

In his texts on pure economics, each page expresses Pareto's argumentative style and his determination to arrive at sharp and clear concepts based on the unambiguous logic underlying economic activities. Pareto could, however, be devastatingly polemical when engaged in political argument.

In the analysis of social contexts in the *Manuale* which anticipate his sociology, there are occasional bright flashes which illuminate another world, governed by elemental, rather than rational, forces. The contrast between logical and non-logical actions which Pareto makes reaches a philosophical profundity that few have ever attained in the specialized literature of economics.

Pareto's unusual talents found early confirmation in a brilliant performance at school and university, and the confident authority with which he put forward his truths in later texts is already apparent in the dissertation he submitted at the age of 21. The editor of Pareto's *Scritti teorici* points out how this short work, despite its purely physics content, 'throws a remarkable light on the personality of the author because it reflects the methodological ordering which he later employed in the most brilliant period of his scientific activity' (Pareto 1952, p. V, my transl.). In a footnote in his *Theory of the Elasticity of Solid Bodies*, Pareto remarked:

*Per me sono persuaso che o si debbono dare teorie rigorose, oppure formule empiriche basate sulla esperienza, ma che assolutamente debbano bandirsi dalla scienza quei ragiomamenti coi quali si viene a dare un'apparenza superficiale di verità a false teorie.*⁵²

As an example of the false manifestation of exactitude, Pareto gives the use of Bernoulli's formula, $v = \sqrt{2gh}$, appropriate to laminar flow, for the turbulent stream of escaping steam. Such a thing is nothing other than '*vera poesia*' – an early example for Pareto's sarcastic marginal notations.

The opposition that he makes between rigorous theory and empirically established formulae, which are not of the same scientific level, is, however, also characteristic of his later work. He is most famous among economists today for the development of the basic ideas which are today known as Paretian welfare theory, which, without any doubt, is a major achievement of Neoclassical theoretical construction. However, his law of distribution lacks such a deductive foundation

in an axiomatic system, nor did he claim for it the same kind of generality. Today, in the statistical analysis of the distribution of personal income, other functions are used, rather than Pareto's $A(x+a)^{-a}$, which is supposed to determine the number of income earners with an income $<$ or $= x$. But this law still has its uses in the measurement of the distribution of higher incomes.

In the twenty years between 1870, when he received his doctorate, and 1890, when he met Pantaleoni and Walras and took up the study of mathematical economics, Pareto pursued a three-fold career as businessman, politician, and political journalist. He was personally very successful, so that after many years of effort he was appointed to the position of general director of an important steel company, but, ultimately, he failed to secure the capital necessary for modernization. He was forced to resign after his unsuccessful speculation in the London metal market. Although he had to work very hard to resolve the company's economic and technical problems, Pareto found time to participate in scientific societies, to write pamphlets defending liberalism and the free market, and to stand as a candidate for various political offices, and he even received an aristocratic title.

It was certainly remarkable that this argumentative man, who, having left France in his early youth, was critical of the politics of the young Italy and was moreover considered to be an ultra-liberal and a pacifist, quickly became the successor of Walras, who was politically well to the left of him, at the university in Lausanne. Pareto assumed this office in 1894 and wrote his *Cours d'économie politique*, followed by *Manuale di economia politica* in 1905. These works tend to be regarded as a further development of Walras's theories, but Pareto differentiates himself from his predecessor not only in political philosophy – he was far removed from Walras's '*petit bourgeois* radicalism' (Schumpeter 1951b, p. 119) and the call for the nationalization of the land – but there are also differences between them regarding the form and content of general equilibrium theory.

Their divergence over capital theory, seldom noted, deserves, I think, special attention. In his period-oriented analysis of the production of capital goods, Walras assumes a standard interest rate on capital, since with constant returns the prices of newly produced capital goods are formed by the production costs – that is, the equilibrium prices of raw materials and the exploited capital goods, wages, and profits. As has now been proved many times, this determination of the prices of capital goods by means of production costs is inconsistent with the theory of supply and demand in a particular period. For, with the equilibrium prices determined in this way, there arises a direct demand for consumer goods and, consequently, a derived demand for capital goods in specific proportions which the production of capital goods can only match by chance, if during the production of capital goods the initial stocks are fully employed and used up, which in a theory of supply and demand corresponds to full employment. Since each initial stock could be fixed at any quantity, while, conversely, prices for a given technology and profit rate are set at costs, from which the demand for the goods is derived, there is an overdetermination of the equilibrium system. This cannot be eliminated by variations in the interest rate – for example,

by an adjustment of savings. Pareto, by contrast, formulates capital theory in an intertemporal model after the fashion of Fisher. To that extent, interest becomes an aspect of intertemporal exchange. Pareto, however, remains cautious when it becomes a question of citing reasons that might explain why the interest rate is at a certain level.⁵³

Immediately after the publication of the *Manuale*, Pareto turned to sociology, apart from working on the French edition of the *Manuale*. His classic text, *Trattato di sociologia generale*, was published in 1916, a work whose content and importance cannot be assessed here. Pareto continued his involvement with political and social questions. Like Keynes, he was among the critics of the Versailles Treaty and of the misguided reorganisation of European scholarly and political relationships after the First World War. He considered inflation, which to varying degrees affected most European nations during the early post-war years, to be a result, rather than a cause, of economic misallocation. His position on Fascism, whose emergence he lived long enough to experience, was controversial.⁵⁴

The *Manuale*, or the *Manual*, is Pareto's most important contribution to general equilibrium theory. It is at the same time his most important economic work in his transition to sociology.⁵⁵ Schumpeter thought that the differences between Walras and Pareto left each of their systems essentially unchanged. Pareto's methodological shift did, however, lead to two of his most important theoretical developments: his express and well-founded replacement of the old theory of utility with preference relations and, on this basis, the establishment of the rationality of competition. He also distanced himself from normativity, in the hope of arriving at an empirical foundation for pure theory and, above all, warned of overestimating the purely rational as an impetus for human action. Truths do not prevail of themselves; hence, the emphasis on non-logical actions in the *Manuale*; hence also, in the later papers, the attacks on economists who defended political measures only with reference to theoretical economics.

The *Manuale* seeks to demonstrate that his theory can be founded independently of a cardinal interpretation of utility; indifference curves are sufficient for the theory. They had already been introduced by Edgeworth in his *Mathematical Psychics* (1881); Edgeworth, however, remained wedded to the idea of measurable utility. To that extent, alongside Fisher, Pareto took the considerable step away from a concept of cardinal utility that he considered unfounded. In seeking to establish his theory of ordinal utility, however, Pareto wavered between two very different approaches: on one hand, basing the use of indifference curves on what is today the predominant viewpoint, the pure rationality of purchasing behavior, or, on the other hand, and quite characteristically for him, supporting it by means of an empirical or experimental observation of indifference curves. The latter partial problem was the subject of repeated attention. I cannot resist the temptation here of appending a supplement to this.⁵⁶ Other topics broached by Pareto are of far greater importance, but there is a certain mathematical appeal in dealing with this one.

Supplement

Pareto's presentation of indifference curves by means of differentials and their integration

For a long time, phenomena have been observed in consumer theory which are viewed as paradoxes relative to Neoclassical Theory and which derive partly from empirical observations, partly from deductions from unexpected outcomes of axiomatic systems, and also in part from experimental economic research. 'Giffen's Paradox' is well known and was already discussed at the beginning of the nineteenth century. One conception was that an increase in the price of bread for the general mass of people could lead to an increased demand for this most important of all consumer goods, because a tight budget would no longer allow for the purchase of meat, and therefore hunger could be satiated only with increased consumption of bread.⁵⁷ A modern experimental example is as follows: It is observed that the preference and monetary valuation of events with the same expected value can be different. In an experiment, a lower profit of higher probability is preferred to a higher profit with lower probability, even though a higher monetary value is attributed to the latter.⁵⁸

Most noticeable are the paradoxes in which the transitivity of individual preferences is assumed, but which is transgressed in groups. This possibility is known, first of all, from the analysis of voting. There are three people, 1, 2, and 3, who can choose between three objects, *A*, *B*, and *C*. The first person prefers *A* to *B* and *B* to *C*; the second person, *B* to *C* and *C* to *A*; the third person, *C* to *A* and *A* to *B*.

In a very well-known analysis, based on Condorcet (1785), it can be ascertained that here a majority prefers *A* over *B* (specifically 1 and 3), another majority *B* over *C* (1 and 2), so that for the sake of consistency, a preference for *A* over *C* might reasonably be expected for the group as a whole. There is, however, another majority (specifically 2 and 3) which gives priority to *C* over *A*.

This paradox can be applied without difficulty to the purchasing behaviour of individuals, if it is assumed that each has a different preference according to the role he or she plays in society. It could be a father who considers walking more important than reading and reading more important than watching television. At the same time, as a teacher, the same person might give reading priority over television, and television over walking – whereas for leisure, television over walking and walking over reading. In such cases, analogous contradictions can be seen: when confronted with individual roles, if all three are to be observed or, as in the selection, if they are compared with each other in pairs.

It is also possible to become ensnared by situation-related contradictions. In a written examination analysis of consumer behavior, the situation was to be analysed where, when invited for a meal the first time, a consumer chooses a smaller steak, rather than a larger one; while at the second invitation, the same person prefers to eat fish, rather than the small steak, because otherwise it might be assumed that he does not like fish; and at the third invitation, this person would rather choose a large steak than the fish because it tastes better and because, in so doing,

he recognizes the generosity of the host. To an observer of the first event, this consumer reveals that he prefers a small steak to a large one, while from observation of the second and the third, it would have to be concluded that the larger steak would have been preferable to the smaller one.⁵⁹

These paradoxes are, apparently, of entirely different nature. The paradox raised here first, the paradox of demand, could be explained by the different nature of luxury goods and necessary goods. (It is just this necessary good that was a Giffen good here, while, with the snob effect, according to Veblen, the higher the price the higher the demand for a luxury item.) One tries to explain the paradoxes concerning expected utility with the ignorance of consumers regarding probability. Explanations for the more easily observable inconsistencies in preference can be sought in the changing societal tasks which an individual has to fulfil. And there are, finally, situational motives which might generate paradoxical purchasing behaviour, in which moral considerations or the desire to indulge one's own taste in purely hedonistic terms conflict, as in our last example.

Pareto's concept of logical action sought to define a rational individual by means of axioms regarding optional actions, excluding the transitivity of preferences and the accompanying contradictions of the kind just raised. This is proved by the later development of the theory of preferences from Pareto's ideas. Hicks resolved a paradox and added the possibility of including Giffen goods in the analysis of indifference curves. To the degree that Pareto also allotted special importance to the possibility of non-logical actions and, furthermore, even considered logical or rational action in our sense to be the exception in broad areas of life, his conception allowed for the observation of inconsistent consumer behaviour.

Because of his different methodological approach, however, what we would consider inconsistent consumer behaviour assumes an important position for Pareto. He places such value on the observation of indifference curves not only because they allow him to replace cardinal by ordinal utility, but because he repeatedly holds that indifference curves are the real empirical given. In an appendix to the *Manuel*, he specifically assumes that one could *observe* what we would today call the rate of substitution between two products x and y . An equation in the form

$$0 = f_1 dx + f_2 dy \quad (1)$$

expresses the rate of substitution

$$\frac{dy}{dx} = - \frac{f_1}{f_2} \quad (2)$$

which for small changes, at least, could be established by surveys, Pareto thought. Pareto thus launches into an examination of whether a particular form of utility theory can be developed from this starting point and what characteristics it might possess.

We begin formally. Under certain quite general conditions, which will be considered in more detail below, a differential expression such as (1) can be integrated

by transforming it, by means of a simple substitution into a normal integral. To do so, the point (x, y) is interpreted in the plane as a function of a parameter t , which moves in a closed interval, $0 \leq t \leq 1$ so that our point describes a (continuous and piecemeal continually differentiable) path in the plane. We write the expression (1) as a differential of an unknown function F :

$$dF = f_1 dx + f_2 dy.$$

Function F is obtained along this defined path through integration:

$$\begin{aligned} & F(x(t), y(t)) - F(x(0), y(0)) \\ &= \int_0^t \left[f_1(x(t'), y(t')) \frac{dx}{dt'} + f_2(x(t'), y(t')) \frac{dy}{dt'} \right] dt'. \end{aligned} \quad (3)$$

Function $F(x, y)$ is clearly defined, provided that the integration along each path which connects the given beginning and ending point yields the same value.

Let us attempt to put in modern terms what this means for economics. Pareto thought that the equation for the substitution rates (2) would be set experimentally. This equation (2) can apparently be viewed as a simple differential equation for a set of indifference curves in the plane. Through integration (3) a utility index is obtained which is at first dependent upon the integration path selected. The utility does not change along an indifference curve for which (1) and (2) apply. The integration is independent of the line between two given points if and only if $F(x, y)$ assumes the same value for every path upon which it possible to go from $(x(0), y(0))$ to $(x(t), y(t))$. This is precisely the case if differential (1) is a total differential, i.e. exactly if and only if a function $F(x, y)$ exists with the differential

$$dF = f_1 dx + f_2 dy \quad (4)$$

with

$$f_1 = \frac{\partial F}{\partial x}, f_2 = \frac{\partial F}{\partial y}. \quad (5)$$

Thus, utility index F can, under certain conditions, be chosen independent of the path. If a function F exists with a total differential according to (4), under the conditions of (5), it is defined up to a constant whose size is fixed in (3) by the limits of integration. To that extent, the utility index is unique.

With path-dependent integration, by contrast, utility depends on the sequence of consumption acts. The utility is not the same, depending on whether (in Pareto's example) the soup is eaten first and then the roast, or if the usual order is reversed. If x measures the amount of the main course eaten, y the amount of the starter eaten, with two sequential approaches, two paths of consumption are possible, from zero $(0, 0)$ to a point (x^*, y^*) , in each of which the amount x^* of the main course and y^* of the starter is consumed: One can either move along the x axis,

where $y = 0$ to point $(x^*, 0)$ and from there, without increasing x , up to (x^*, y^*) . Or one can move along the y axis, first of all to $(0, y^*)$, and then parallel to the x axis to (x^*, y^*) . In the latter case, it is the normal order of starter and main course, and we will demonstrate that a higher value may be obtained for $F(x^*, y^*)$ than by following the first consumption path or line of integration.

Pareto chose not to cancel out the paradox of the unequal valuation of the same groups of consumer goods by dating consumer goods. He quite mechanically assumes that only the substitution rates are fixed, as in an animal experiment, in which the consistence of plans cannot be directly established.

Now, in order to determine whether the integration of expressions, as in equation (1), is generally successful and path-independent, we need the following theorem, which can be formulated for higher-dimensional space (more than two products) as follows: In a simple, connected domain G of n dimensional space (simplified: an area without a 'hole'), the functions

$$f_1(x_1, \dots, x_n), f_2(x_1, \dots, x_n), \dots, f_n(x_1, \dots, x_n)$$

are given, which possess continuous partial derivatives. There is then and only then a differentiable function $F(x_1, \dots, x_n)$ of the n variables which everywhere fulfils the conditions

$$\frac{\partial F}{\partial x_v} = f_v; v = 1, \dots, n; \quad (6)$$

if the $n(n-1)/2$ conditions for integration

$$\frac{\partial f_\mu}{\partial x_v} = \frac{\partial f_v}{\partial x_\mu}; \mu < v; \mu, v = 1, 2, \dots, n; \quad (7)$$

are everywhere fulfilled.⁶⁰

It is obvious here that F is the integrating function, whose total differential can be written as

$$dF = \sum_{v=1}^n f_v dx_v = \sum_{v=1}^n \frac{\partial F}{\partial x_v} dx_v. \quad (8)$$

In two-dimensional cases, the integration conditions (7) are reduced to the simple but not trivially fulfilled equation of Cauchy-Riemann:

$$\frac{\partial f_1}{\partial x_2} = \frac{\partial f_2}{\partial x_1}. \quad (9)$$

It is finally important to require that G be simply connected. In order to detect this, one proceeds from the observation of the total differential to a curve integral, in which the coordinates (x_1, \dots, x_n) are made to represent an arbitrarily selected path by means of continuously differentiable functions $x_1(t), \dots, x_n(t)$

of a parameter in an interval $0 \leq t \leq 1$. Along each path in G an ordinary integration of differentials is possible:

$$H(t) = \int_0^t \sum_v f_v \frac{dx_v(t')}{dt'} dt'. \quad (10)$$

The proof of the theorem cited is now based on the confirmation that $H(t)$ only depends on the coordinates $x(t)$, so that F defines the integrating function F sought in (6) or (8). This can be seen intuitively when the differential is considered to represent the tangent plane for surface F . The integration can be accomplished by proceeding from the tangential level point along an arbitrarily selected path, beginning from *one* starting point, connected by the line integral (10). If the integrating function F exists, then each point $x(t)$ will be assigned to the same line, independent of path. However, that F does not have to exist, if G is not simply connected, can be clarified with an example: imagine a helicoid which winds upward like a spiral staircase around the x_3 axis over the (x_1, x_2) plane. With the exception of the zero point, the differentiation conditions of Cauchy-Riemann (equation (9)) in (x_1, x_2) are met. Accordingly, one obtains through (10), in a simply connected area, not containing the zero point, something of a circular area – a piece of a sheet of the helicoid. On its own, this is a function. However, if it is integrated along a line that circles around the zero point, in a ring plane around the zero point, a line leading back to the starting point assigns a different value to the latter than to the starting point and, more generally, to each point on the circle two different values on sheets of the helicoid laid on top of each. Repeating the movement on the circle, the multiple values of the helicoid, which as a whole is no function, are reached successively. The result is due to the fact that the Cauchy-Riemann conditions here are not valid for *one* point, the zero point.

It might also be the case, however, that the Cauchy-Riemann differential equations are fulfilled at *no* point; the integral then will also be path dependent, even in simple connected planes. For a simple example of this, assume $n = 2$ and $f_1 = y, f_2 = 0$. Now, if one integrates along the unit square on the four lines from $(0, 0)$ to $(1, 0)$, from $(1, 0)$ to $(1, 1)$, from $(1, 1)$ to $(0, 1)$, and back from $(0, 1)$ to $(0, 0)$, it is immediately noticeable that the curve integral (3) on the first part of the line disappears, because y disappears, that on the second and fourth parts of the line the integral disappears, because dx or dx/dt disappears; the integration from $(1, 1)$ to $(0, 1)$ remains, thus with $y = 1$, and $x(t) = 1 - t$,

$$\int_0^1 y \frac{dx}{dt} dt = \int_0^1 (-1) dt = -1,$$

which could also have been proved with Gauß's theorem on the transformation of curve integrals in an area integral. Since the integral over a closed path here yields a value different from zero, two different results over two different paths are obtained for an integration with the same beginning and the same end points.

Accordingly, it is observed that the integration partially carried out from $(0, 0)$ through $(0, 1)$ to $(1, 1)$ yields value 1, while value 0 is obtained for the line from $(0, 0)$ through $(1, 0)$ to $(1, 1)$. A somewhat artificial economic interpretation, necessarily so due to the simplicity of the example, is possible. If y stands for the soup and x for the roast, an increase dx in the consumption of the roast may cause a proportional increase of utility dF in the level of the soup consumption (thus $f_1 = y$), while an increase in the consumption of the soup dy , with some already positive level of roast consumption, yields no additional utility ($f_2 = 0$). Therefore, on the line from $(0, 0)$ to $(1, 1)$ a gain in utility of one is obtained, when on the line passing through $(0, 1)$ the soup is eaten first and then the roast, whereas if the sequence is reversed, on the line over $(1, 0)$, no gain in utility occurs.

In the calculation of path-dependent utility integrals, Pareto did not start with the determination of the substitution rate according to (2), which might be thought to be empirically measurable, but with a differential expression from (1), which – without changing the differential equation for the indifference curve in (2) – can still be multiplied by a non-vanishing function. Thus, such differential expressions (1) in two-dimensional cases, when f_1 and f_2 do not vanish, can in specific examples be so transformed that they fulfil the Cauchy-Riemann conditions and a path-independent integral is obtained. This is called multiplication with an integrating factor. Even when it can be shown that an integrating factor under fairly general conditions exists, it can still be difficult to explicitly state it.⁶¹ An example will have to suffice.

For this, we begin with differential equation (2) in the form

$$\frac{dy}{dx} = -\frac{f_1}{f_2} = -g(x, y). \quad (11)$$

We define

$$h(x) = \exp \int_0^x \frac{\partial g}{\partial y} dx'.$$

Here we assume that the integral on the right exists and that h is only dependent upon x . The equation that results from (11)

$$0 = g(x, y)dx + dy$$

is multiplied with $h(x)$. We obtain

$$0 = h(x)g(x, y)dx + h(x)dy. \quad (12)$$

Because

$$\frac{\partial}{\partial y} h(x)g(x, y) = h(x) \frac{\partial g}{\partial y}$$

and because

$$\frac{\partial}{\partial x} h(x) = \frac{\partial}{\partial x} \exp \int_0^x \frac{\partial g}{\partial y} dx' = h(x) \frac{\partial g}{\partial y},$$

the Cauchy-Riemann conditions in (12) are fulfilled.

Thus, an example is presented for two-dimensional cases showing how the differential equation for the indifference curves, generated by an experiment, can be transformed by an appropriate transformation – without changing the geometry of the indifference curves – so that an integration producing a utility function is possible. However, a certain arbitrariness is inherent to this transformation. If path-dependent integrals are admitted, starting from equation (1), a general and clear determination of utility up to path-dependent results, through integration of (3). If the transformation through multiplication of (1) is allowed, the utility function, as can be quickly realized, will be determined by the indifference curves up to a (monotonic) transformation $U = U(F), U' > 0$, and, up to the addition of a constant; path-dependence, however, will be made to vanish. Because of the more complicated requirements of multidimensional cases, following (7), the result cannot easily be generalized, so that Pareto had to conclude in the article already mentioned on *'L'ofelimità nei cicli non chiusi'* that the utility (and marginal utility) of goods could not be completely determined by following his procedure.

It remains unclear in the end how the differential equation (1) is supposed to be experimentally determined in the first place. An experimental determination of the substitution rate (2) would define only the quotients f_1/f_2 , but not the absolute value of f_1 and f_2 . This would be possible if for each (x, y) , by means of a linear equation

$$dF = f_1 dx + f_2 dy,$$

the variations of dx and dy and the corresponding dF would be measured, in order to determine f_1 and f_2 , using a linear regression. However, that would amount to a cardinality of the utility function.

Thus, Pareto's fascinating attempt to define a path-dependent utility function failed. When we consider why he ever took on this peculiar investigation, I cannot avoid the suspicion that he allowed himself to be guided not only by an economic problem but also by a mathematical question that was of interest at that time. At the turn of the twentieth century, integration tasks of the kind we have used were systematically investigated in complex spaces (theorem of Goursat in function theory) and in the context of the generalization of the theorem of Stokes on the integration of vector fields.⁶²

It must certainly be admitted that in the course of its development, mathematical economics was often more strongly determined by the available mathematical apparatus of the time than, by contrast, mathematical science was enriched by problems derived from economic questions. Since the second quarter of the twentieth century, there have indeed been brilliant mathematical ideas which have been inspired by economics; among the most important early stimuli can be

included the further development of the fixed point theorems by von Neumann in the context of a growth model and his game theory. Older examples – with the exception of Bernoulli – however, are hard to come by, while the questions posed by physics have exerted a major influence on mathematical development since the time of Newton and Leibniz.

Increasing returns, competition, and growth

The debate on economies of scale conducted in the *Economic Journal* during the eight years between 1922 and 1930 is neither a book nor the work of a single author, as is the case with most of the essays collected in this volume. But there are several reasons why a consideration of this debate can yield important insights.

The typical form of argumentation from the Mercantilist era until the time of Ricardo was the pamphlet. After that, our notion of important contributions to economics is shaped by the great monographs of the late eighteenth and the nineteenth centuries. The ideas upon which modern economics is based were then almost exclusively presented in books, and the form implies a belief that these writers were creating a system. Admittedly, the inspiration for new ideas often came from the field of political economy. Thus, new theoretical approaches also developed from reflections upon day-to-day questions, when people who were not satisfied with merely propagating interests and repeating the old positions came together and sought to explore contemporary issues in greater depth.

No treatise or comprehensive treatment of political economy was published before the time of Mercantilism. Today the dominant form of publication through which economics develops is the journal article, an article which has often been developed from working papers and circulated drafts, so that it is often difficult to pinpoint exactly the moment of emergence of an important idea. Whether conceptual advances in modern economics have been as significant as the flood of formulae in specialist journals will be for later generations to decide.

The publication forms typical of the early period and the contemporary world thus confirm the fact that important contributions to science do not have to consist only of large, single monographs. The essays that comprise the economies of scale debate point forward to our own time. Sraffa's contribution forms a core which unarguably triggered the revolution in European thinking about competition and economic justice; the books by Joan Robinson (1979 [1969, 1933]) and Edward Chamberlin (1962 [1933]) are the developmental milestone that emerged from it (Chamberlin's work being largely independent of Sraffa). From this, there developed various approaches to imperfect competition and the attempt to define competitive norms and an economic policy suited to a competitive environment. Even Eucken's work would be unthinkable today without the epochal change that Sraffa brought about.

Chamberlin and Robinson presented similar theses on imperfect competition in books published in 1933, the conception of 'imperfect competition' still today being linked to their work. They later took very different directions. Joan Robinson would in the end wholly reject the Neoclassical roots of her book. She also became

conscious that her assumption of independently given demand curves in market segments became highly problematic under monopolistic competition, especially in oligopolistic competition, where interdependence of demand was very obvious. She allowed her publisher to reprint her book several times but renounced its argument. Her characteristically firm but controversial attitude was probably the reason she never received the Nobel Prize. Chamberlin, conversely, maintained his position and revised his book again and again, adding real improvements – so that in the end, it read in places like a retrospective on itself.

There are other reasons to explore the economies of scale debate. Specifically, the most important effect of the debate was perhaps that it actually prompted the break away from Marshall's static system of economic analysis and early Neoclassicism in general. The debate prepared the way for the basic ideas of modern growth theory, especially the theory of endogenous technical progress, to which Kaldor, as we will see, repeatedly referred. However, it is not by accident either that Schumpeter took part in the debate: he used the opportunity to present his synthesis of the dynamic of economic development, sustained by entrepreneurs, with the static system of Neoclassical analysis.

The importance of Schumpeter's contribution to the debate is often overlooked because he presented his general ideas more effectively and in greater depth elsewhere. It was here, however, that he explained his own position on method, as compared to that of Marshall. The contribution of the American Allyn Young, teaching in London, had greater repercussions on the Anglo-Saxon tradition; after Sraffa, his were the most important contributions to the debate.

The debate does not consist solely of high points, although each participant was an interesting personality. Pigou, Marshall's successor, was famous for his contributions to welfare theory, with their implications for modern environmental policy. He made several attempts to save Marshallian partial analysis, the apparatus upon which his numerous and influential works on economic theory and political economy were based.

Dennis Robertson, who contributed several times to the published debate – an important figure in Cambridge, temporarily in London, but eventually Pigou's successor – is best known today for his contributions on monetary theory and the theory of cycles: he was Keynes's friend and yet his opponent from 1936 on. Robertson attempts – in an even more orthodox fashion than Pigou and, if I may say so, an even more naïve way than the master, Marshall himself – to save the analysis of competitive markets enjoying increasing returns by using falling cost curves.

Another contributor to the debate was Lionel Robbins, a short time later made famous by his book on Neoclassical method. At 31, he was a friend of Hayek and an influential professor at the London School of Economics. In the years after the war, he made important contributions to the reorganization of British colleges and universities. He was, moreover, generally a figure of extraordinary charisma, in both economics and the arts. In his contribution to the debate, he made quite clear his independence from the particular form of Neoclassicism predominating at Cambridge under Marshall's influence by rejecting their phrase 'the representative firm'.

Gerald Shove, a man who over many years of teaching influenced generations of Cambridge economists, apparently wrote much but certainly published little, yet among his few publications is a contribution to the closing symposium of the debate. Richard Kahn (1987) suggested that ‘In the course of fifteen pages he threw out a host of path-breaking ideas, which have exercised a deep influence on the development of economic thought in this field.’

It is surprising that the entire debate was triggered by a historian, John Clapham, who, like members of the Younger German Historical School, had little time for the apriorism of the theorists. He was later a writer of solid reference works on economic history but from 1908 to 1928 was a history tutor for King’s College, Cambridge – the college of Pigou, Keynes, and Shove.

Keynes himself was the editor of the *Economic Journal*, and his composition of the contributions to the symposium, which closed the debate, was called by Schumpeter (1954, p. 1046) a sign of ‘editorial genius’. In fact, Keynes distanced himself from the contemporary discussion of imperfect competition in a very conspicuous way. While all of his Cambridge friends and students became deeply engaged in the controversy and sought to contribute to it, Keynes read the texts but maintained a discreet distance. Later, his *General Theory* retained a Marshallian form in its microeconomic foundation. As he said in the introduction to the symposium, he found the critique of his friend Sraffa ‘negative and destructive’ (Keynes 1930, p. 79).⁶³

A network of personal and academic relationships became apparent in the debate, with Cambridge as the academic hub and Marshall its spiritual centre. Students struggled to substantiate, uphold, and disseminate the doctrine. Sraffa became an academic monument in the university, but even in 1969, when I first went to Cambridge, he still was seen as remote and alien, hard to understand, and this did not change right up until his death in 1983. He kept to himself, despite his kind, worldly, and modest way of life, which, as he later increasingly suffered memory loss, let him meet even total strangers with a friendly and hearty greeting (Schefold 1996a).

The modern reader of the debate must resist the temptation to interpret individual statements in the light of formal solutions which were developed a short time later, for these models represent only some of the possibilities which had begun to emerge. The economies of scale debate makes up both more and less than the textbooks on imperfect competition which developed out of it. More, because today, in particular, the inspiration we can derive from these discussions of increasing economies of scale and growth could take up more of our time; less, because the key concepts which modern textbooks use to concisely present imperfect competition were for many years simply not found.

This becomes clear in the summary of the leading ideas which Shackle (1967) provided in his book on the ‘years of high theory.’ Shackle sees the long decade between 1926 and 1939 as the great leap forward after forty years of the constant accumulation of knowledge, consolidating the development of Neoclassical Theory from 1870 to 1914. The system established then, characterized by the theory of general equilibrium with full employment and efficient allocation of resources,

by perfect markets, and by the assumption of many firms, predicted a state of equilibrium in which history and uncertainty had no place. Shackle thought that the crisis of the First World War had prepared the way for a creative eruption, and he cited, above all, Knight, Myrdal, and Keynes, as well as Harrod, Leontief, and Hicks, as precursors. He sees the actual trigger in Sraffa's 1926 essay, and he asks how it could be possible that the dilemma – that increasing returns are necessary for understanding economic growth, but that increasing returns are inconsistent with the theory of perfect competition by means of which equilibrium was analysed – remained unexplained for so long. There was clearly a dilemma, visible essentially from Cournot until Marshall and afterward to Clapham, but it was not dealt with. Marshall understood it but did not discover the consequences, and thus it was left to Sraffa to bring the problem into the light. Therefore, 'Our period opens with the Sraffian manifesto of 1926' (*ibid.*, p. 12).

What was lacking, according to Shackle, was the marginal revenue curve. From the perspective upon imperfect competition taken by Chamberlin and Robinson, this remark is correct, if also technically one-sided, because new developments in industrial economics centre upon different aspects of imperfect competition than monopolistic competition. Cournot (1991 [1838]) and Stackelberg (1991 [1934]) are among the starting points, and we know today that before the end of the twenties, Sraffa himself would draw other conclusions, in which he not only abandoned the Marshallian but also the Neoclassical approach in general and returned to a modernized Classical Theory of price determination, which departure was, however, only published more than three decades later (Sraffa 1960).

Thus, Shackle's interpretation of the meaning of the 'Manifesto' remained limited; as he was writing, the capital theory controversy which had finally developed from Sraffa's ideas had only just begun, and the new theory of growth was not yet in sight.

His ultimate judgment is:

The fame of having assembled, out of the old confusing heap of notions concerning diminishing and increasing returns, and the scattered hints in Marshall, a clear picture of a new problem and the essence of its solution, belongs to Mr. Sraffa. One essential piece only is missing.

(Shackle 1967, p. 21)

The piece that was lacking, the marginal revenue curve, was already inherent in Cournot's mathematics and was also outlined by Marshall but remained undeveloped. Though Cournot may have found the Cournot point, thus formally solving price determination in monopolies, no one, however, formulated the solution condition, which every student today learns in the form 'marginal revenue = marginal costs.' They did not manage the transition to the theory of monopolistic competition, with its hypothesis about the division of the market into segments for individual firms. Thus, the riddle remained how with increasing returns, which a monopoly appeared to require, competition – even if not perfect – could continue to exist.

Among the most important concepts for which the economies of scale debate prepared the way, but which were not fully worked out, is the description of long-run cost curves of a firm as enveloping short-run cost curves. A careful explanation of this model, based on Viner, can be found in one of Chamberlin's (1962 [1933], p. 230ff.) appendices.

Let us assume that in the long run, a firm must incur costs $K(x)$ for the production of the amount x . Among the problems considered in the economies of scale debate, later neglected in discussion of theoretical models, is what constitutes the identity of the enterprise in the long run when it is gradually reconstructed anew, based on the current state of knowledge available today. Here, this identity is assumed. If the economies of scale are constant and the unit costs $K(x)$ can be represented as a parallel to the x axis, $K(x)$ also everywhere represents the optimum, in the usual sense, for the firm. The marginal costs and the average costs correspond in the short run to the average costs in the long run. With an established firm and a deviation from planned production level x , higher costs are experienced in the short run, which are represented as a U form curve tangential to the $K(x)$ curve of average costs. (The curve for average short run costs falls, as is well known, to the left of the optimum, because the fixed costs have to be attributed to the product; they increase to the right, because planned capacity will be exceeded.)

How does the picture change when long-run average costs are not constant? Sraffa explored this in great detail in another well-known Italian essay from 1925. In the conclusion to the main results for the 1926 essay, however, he did not present the model.⁶⁴ In the texts which comprise the economies of scale debate, the formal model remains unclear, while the reasons for long-run costs not remaining constant are discussed in depth. Let us assume that they at first fall and then rise. Now, $K(x)$ is itself a U-curve, which envelops the U-formed short-run cost curves – whose existence and differentiability we want to assume. The short-run cost curves must in any case touch the long-run ones, since at the planned optimal point short-run and long-run costs correspond. The short-run cost curves, conversely, could not intersect with the long-run ones, because otherwise points for short-run costs would appear below the long-run cost curve, i.e. a point x' , which would indicate lower production costs than $K(x')$, which would conflict with the assumption of the model of $K(x)$, because a cost level which could be attained in the short run must also be attainable in the long run (the reverse is true only for the point which was planned for the long run). This leads to the fact, which astonishes every beginner, that in every field of increasing returns, thus on the declining part of the $K(x)$ curve, right from a tangential point x' , the short-run costs show a continued tendency to fall (even if it is less marked than for the long-run costs), and the short-run costs only correspond with the long-run costs in x' (and not, for example, in the minimum of short-run costs).

Even more subtle is the question why economies of scale rise or fall in the first place. This problem was dealt with in the debate many times. Many authors later thought that increasing economies of scale could be traced back to indivisibility, because efficient technologies can often be implemented only above a certain

volume. However, the viewpoint was advanced – specifically, by Pigou, in the economies of scale debate – that falling economies of scale were simply not possible, since, as soon as a certain technology is feasible at a certain level, it can also be replicated at double the level at the same cost per unit. When production costs increase due to the expansion of manufacturing, this could only be due to the fact that the costs of factors which might obstruct the expansion of production were not taken into account; thus, there was a confusion of partial variations with scale variations. This argument, in essence, goes back to Sraffa's article from 1925. Chamberlin points out in this regard that with an expansion of scale, the combination of possible factors or their organization could improve or deteriorate. He believes the homogeneity of factors is not sufficient to exclude poorer organization at a higher level; whoever wants to conclude from the homogeneity of factors, in particular, that the economies of scale are at least constant or rising but could not fall simply makes the tautological assumption of constant economies of scale, rather than proves them.

I find Sraffa's and Pigou's argument that every technical combination of factors must be completely replicable at a higher level admissible, despite what Chamberlin says. Declining economies of scale are therefore a *contradictio in adiecto*. It is noteworthy, however, that Kaldor (1978, p. 196, appendix), an early advocate of the indivisibility argument for explaining increasing economies of scale, in the end said Chamberlin was right on this and other points.

Kaldor, however, also makes it quite clear that it was not the formal aspects of the economies of scale debate that here interested him. Unhappy with the reestablishment of the dominance of equilibrium theory in the 1960s, he wrote,

The difficulty with the new start is to pinpoint the critical area where economic theory went astray. In my own view, it happened when the theory of value took the centre of the stage – which meant focusing attention on the *allocative* functions of markets to the exclusion of their *creative* functions.

(Ibid., p. 181)

He did not look for emphasis on the creative part of the market process in Schumpeter but in Allyn Young's contribution to the economies of scale debate, where he discussed increasing returns through division of labour, indirect production, Learning-by-Doing, and 'dynamic economies of scale': 'Once . . . we allow for increasing returns, the forces making for continuous changes are *endogenous*' (ibid., p. 186) – a point that Young had made. With Myrdal, the 'principle of circular and cumulative causation' would then emerge.

Thus, discussion in the economies of scale debate went, so to speak, separate ways. The starting point was Marshall's theory, which historians of economic thought, interested in analysis, have always mercilessly characterized as a condition of disorientation: 'Alfred Marshall had left the waters of value theory thoroughly muddied; he hinted at everything and was precise about nothing' (Niehans 1990, p. 300). Schumpeter (1954, p. 1046) wrote, 'Marshall . . . thus blurred the clarifying distinctions between falling cost curves and downward shifts of cost curves

and between costs that fall while production functions stay put and costs that fall in consequence of changes in production functions.'

From this critical starting point, the discussion moves off in two directions. Schumpeter (1954, p. 1047) did not find the critique of rigorous model building and the formalisation of problems of imperfect competition, a critique which is expressed in Sraffa's uncompromising rejection of Marshall's theory, as destructive, as did Keynes. However, the debate shifted to visions of quantitative growth driven on endogenously by innovations in organization and invention, which also rolls onward as a development process leading to constant qualitative changes of technologies and methods of production.

I would recommend that the reader begin with Clapham's easily understandable question and then read the two main essays from Sraffa and Young, each of which exemplifies a direction that these two developmental possibilities could take. The symposium shows the conclusions that were then available, which admittedly can first be understood and evaluated only when the other, more formal essays are studied with due care.

Clapham begins with the curious lament that while different kinds of hats can be organized in boxes, industries are not divided according to their returns. It sounds like an echo of the debate over method when Marshall's *Principles*, a work ubiquitous in Cambridge, is compared with his other important book, *Industry and Trade*, in which differentiations introduced by Marshall, the analyst, so that they might be applied were not then applied by Marshall, the observer.⁶⁵ The problem of classification is understood remarkably concretely by Clapham when he questions the national frontiers of an industry, clear delineation of which seems to him hard to sustain, in view of, for example, the case of the collapse of the Austro-Hungarian Empire. If national borders are accepted, it can be asked whether, for example, the British coal industry should be characterized in terms of declining returns, since its growth was associated with organizational advances. Marshall expected declining returns in old countries and rising returns in new ones. What does that mean for sheep production in Australia? Why should the scarcity of land trump industrial progress? It is this condensation of heterogeneous influences, some related to specific periods, some traversing periods, into a single law of costs which leads to such indeterminacy – so the way in which Clapham asks the question the determination of 'laws' of return cannot be resolved as a historical-empirical problem.

Beneath the ambiguities arising from such applications, Sraffa discovered a logical problem which had no satisfactory resolution in Marshall's system. Sraffa's book of 1960 therefore offers another approach. In place of production functions, he puts the representation of technologies through observed methods of production. Progress through process innovation represents a reduction of costs. Scale advantages are then to be treated like new technologies. Scarcity is identified by observing the coexistence of production methods for producing the same goods: on one hand, extensive differential rents emerge if one product is used on several soils; intensive rents emerge if a capital- and labour-intensive technology coexists with a land-intensive one on a single piece of land (Scheffold 1989a, ch. 19).

Clapham, on the other hand, also had the difficulty that he did not clearly differentiate between changes in returns that can be traced back to variations in scale and those which are caused by partial variations. He acknowledges that the cultivated area has also become scarce in Australia by stating only that there is 'keen competition between agricultural and pastoral interests and, in some districts, between sheep and cattle' (Clapham 1922, p. 309). The advantage of improved 'organization' and 'inventions' also appears to him as good as impossible to differentiate. When there are increasing returns, organizational advantages are no more distinguishable than the advantages which Adam Smith saw in the division of labour; the observation of 'inventions' was beyond the scope of statistics. In modern conditions, inventions follow one another so quickly that they could not be separated, at least empirically, from organizational advantages. Marshall, however, called for a practical application of the categories, since he demanded that indirect taxes should be levied at a higher rate on industries with falling returns than on those with rising returns:

Long before scholars had established that British coal was produced under conditions of slightly diminishing returns, the resultant price rise relative to the price in increasing return areas would have stimulated organization and invention to restore at least a state of constant returns . . . in all these matters the economist is, willy-nilly, an historian. The world has moved on before his conclusions are ripe.

(Ibid., p. 313)

Pigou's hasty answer of December 1922 defends the value of abstract knowledge: to observe that two hats plus two hats equals four hats is less scientific than $2 + 2 = 4$. When Clapham complains about the lack of relevance of theoretical knowledge, it could be objected that the same thing is true of historical knowledge. Looking back from the vantage point of a completed debate, it hardly seems believable that such humdrum arguments could serve to quell emerging questions.

In 1924, Robertson studied the implications for tax policies of differences in return. Pigou expanded Marshall's statements regarding the tendencies of indirect taxes into a postulate that the state in general should levy taxes such that, to ensure efficiency, products could be sold at marginal costs. Robertson then differentiates two causes which could both lead to falling costs. Falling costs could be traced back to the apportioning of fixed lump costs, where indivisibilities exist – or improved production methods were discovered. The indivisibility problem is known from the discussion of railway pricing. The result is that the marginal costs lie below the total cost curve. Pigou favoured an unfeasible subsidy of production on the part of the state, which covered the fixed costs. Robertson's counter-proposal postulates that one sells at full cost without realizing the monopoly profit, which should theoretically arise from falling costs.

He shows this in the case of nationalization:

. . . the logical outcome seems to be that the State, if it takes over an industry of this type, is entitled to neglect altogether, in determining its price- and

output-policy, the costs of the fixed capital embarked, paying for them presumably out of taxation, and pushing production costs to such a point that price covers only the special costs of . . . output, whereas, if my view is correct, the State . . . ought so to regulate output that aggregate receipts cover aggregate costs without yielding monopoly profits.

(Pigou and Robertson 1924, p. 22)

There was still a long way to go to the theory of taxation and regulation of natural monopolies. Robertson sought to incorporate in a similar fashion the second type of falling costs. He might have described in an analytically precise fashion only the case of perfect competition and that of monopoly, although he did in fact describe neither. He lacked a reason for a large number of suppliers remaining in business, in spite of increasing returns, while at the same time rivalry was sufficiently great that the prices they set were not essentially different from normal prices. Robertson, whose thinking was essentially liberal, replaced the yet-to-be discovered analysis of imperfect competition with the conviction that somehow everything must somehow work, and that Marshall had already dealt with it.

A year later, Sraffa's (1925) Italian essay on the relationship between costs and quantity produced appeared, an essay that made a lasting impression on the few readers who followed Italian economics publications: among them Edgeworth in England and Schumpeter in Bonn.⁶⁶ Here we can only deal with the summary which Sraffa added to his 1926 article and which, as we shall see, has occasionally given rise to misunderstanding, given its concise form.⁶⁷

'In the tranquil view which the modern theory of value presents us there is one dark spot which disturbs the harmony of the whole. This is represented by the supply curve . . . ' (Sraffa 1926, p. 536). Despite their formal symmetry, the laws of returns have quite heterogeneous origins and are older than their modern Neoclassical application. Diminishing returns were derived from the connection with agriculture, thus actually from the application of a variable factor to a constant factor. The extension of the argument to other industries has taken place only in Classical economics, insofar as the rising costs of agricultural production in the transition to poorer soils could have had an impact upon industrial production via wages. The concept of increasing returns, by contrast, simply came from one part of Adam Smith's theory of an improved division of labour.

These remarks, which seem relevant only to the history of economic thought, were elaborated in the 1925 essay. Samuelson remarked that in counterposing the increasing and diminishing returns, Sraffa, along with other contributors on the economies of scale debate, failed to differentiate properly between variations in scale and partial variations; diminishing returns often related to economies of scale that had nothing to do with the declining marginal product in agriculture.⁶⁸ Formally, the objection appears to be justified. However, one should not forget that a pure variation of scale never exists, because there are always some factors which cannot be increased in step with others – the globe can neither be inflated nor be duplicated. Thus, at issue is only the economically relevant deployment of factors.

Sraffa also emphasised in 1925 that the law of returns for divisible factors that he attributed to Turgot was wrong. If variable factors – let us say, amounts of capital and labour – were applied to a divisible constant factor, for example, land, the output would not at first grow more and then subsequently less than proportionally, as the law of diminishing returns would suggest. This mistaken notion of the law of returns comes from the idea that at first, small amounts of capital and labour are distributed equally across a large piece of land, which yields, however, a modest return. With higher levels of investment of capital and labour and subsequent equal application, the returns will then increase more than proportionally until, beyond a certain point, falling marginal returns set in. The point at which the marginal returns would begin to decline would be that at which, for the particular technology there employed, the highest return per unit of capital and labour was achieved. Nothing would prevent the employment of this optimal technology with small amounts of available capital and labour on only part of the land, so that with an increase in the investment of capital and labour up to the point of diminishing marginal returns resulting from the extension of the cultivated area, constant and equal marginal and average returns at equal levels would result. As long as land is not scarce, there are, as Clapham perhaps imagines for ‘young’ nations, no increasing but only constant returns; falling average and marginal returns, however, lie beyond the optimum.

Thus, we could say that where suboptimal variations of inputs of capital and labour are concerned, we are dealing with variations of scale, because the factor remaining constant, land, is not yet scarce, and, therefore, no rent is yielded or price of land obtained; this is excluded from economic valuation. A clear partial variation exists only from the point of the optimum onwards. In this way, Sraffa could make it clear to readers of the 1925 essay that there are important circumstances where constant returns to variations of scale materialized, while the followers of Marshall – and especially Clapham – could only imagine constant economies of scale as an improbable overlay of rising upon falling returns which had the effect of exactly compensating for each other.⁶⁹

With this, Sraffa also directed the reader’s attention to the problem of the valuation of factors. The fertility of soil is not a purely natural or technical characteristic but instead an economic statement: fertile soil is that which provides a respectable return compared to the costs invested, and if there are other factors involved besides the land in production and various products are produced, fertility depends on this valuation. This is an argument that is worked out more clearly in his 1960 book: the relative prices of all goods change with the distribution of income, and it is not possible to determine an order of land in respect to fertility before this change has occurred and prices made known (Schefold 1989a, ch. 19).

Sraffa deals with increasing returns in 1925 in a very differentiated manner. An important role is played by a special case of increasing returns yet to be dealt with, those which are from the perspective of the industry concerned internal but are from the perspective of the individual firms external. For this, Sraffa constructs a three-dimensional geometrical representation which is more complex than the derivation of Chamberlin’s long-run average cost curves presented earlier.⁷⁰

In the 1925 article, increasing returns appear, first of all, only as an aspect of the division of labour, as in the Classical economists. Sraffa concludes that returns were moved from the analysis of production in which Classical economists had placed them in the domain of price theory. This matches the shifting of demand and related prices from its classical location in the theory of distribution, so that it became possible to derive from both supply and demand curves which were symmetrically opposed.⁷¹ With diminishing returns, this transfer simply occurred by replacing 'land' with any given scarce factor. Increasing returns, by contrast, necessitated a resort to external effects, because it was recognized that internal returns under conditions of perfect competition (purely quantitative adjustment) necessarily lead to monopoly and hence to a negation of its preconditions. There remains the difficulty, however, of concretely classifying industries according to these cases. Clapham's problem is now theoretically transformed: for a definition of 'industry', one looks to the factors (agriculture, mining, etc.) and anticipates diminishing returns, while with a more detailed approach an industry appears to be defined by its product(s), so that increasing returns are expected. Similarly, diminishing returns are expected when a shorter period is considered, and increasing returns when a longer period is studied.

The real problem – and this is where Sraffa moves from a skirmish to frontal attack – consists of relating the laws of returns in the framework of Marshallian partial analysis to the necessary independence of supply-and-demand curves, together with the requisite concern for the condition of *ceteris-paribus*.

Diminishing returns in the Marshallian framework present the following dilemma: If an industry uses a considerable amount of one factor, then the factor price increases with demand, and the prices of other goods which use the same factor will also be affected by this, such that interdependencies will come into being on the demand side with other markets which violate the *ceteris-paribus* conditions. (An example would be for the consumer substitutable agricultural products from a homogeneous area of land.) However, if an industry uses only a relatively small amount of a factor (as with labour, a factor used in all industries), constant costs result, because the factor price is at best negligibly influenced by the change in the production of the individual industry under observation.

In the case of increasing returns due to external effects, there is a violation of the *ceteris-paribus* conditions similar to that just discussed. With increasing returns due to internal effects in a firm, there is a violation of the conditions of perfect competition. The rarest case consists of returns which are internal for the industry and yet external for the firm. Here, the individual firm acts as price taker, while the cost level declines with the increasing total output of the industry.

Thus, in the context of Marshall's theory, one has essentially to limit oneself to the case of constant costs, hence to an approach which does not really move beyond the Classical Theory of production costs.⁷²

Sraffa's conclusion dismayed his contemporaries. Many believed that they must understand him to mean that as a rule, in reality, constant economies of scale were to be found, although he had in fact suggested only that, with some exceptions, solely this case could be explained by Marshallian theory. He brought together

arguments more clearly in the 1925 essay than in that of 1926 to show that constant returns, in the sense of an absence of tendencies to either rising or falling returns, were thoroughly plausible and not only a marginal mathematical case.⁷³

There were also conjectures as to why Sraffa focused on the Marshallian *ceteris-paribus* condition, rather than examining a general equilibrium in which several markets, with substitutable products, could be simultaneously examined. Was Sraffa even aware of Walras's theories?

It has not been noticed that the 1926 article already includes a direct reference to general equilibrium theory:

If diminishing returns arising from a 'constant factor' are taken into consideration, it becomes necessary to extend the field of investigation so as to examine the conditions of simultaneous equilibrium in numerous industries: a well-known conception, whose complexity, however, prevents it from bearing fruit, at least in the present state of our knowledge. . . . If we pass to external economies, we find ourselves confronted by the same obstacle, and there is also the possibility of confining within static conditions the circumstances from which they originate.

(Sraffa 1926, p. 541)

It is clear from the exchange of letters between Sraffa and Keynes that in contrast to the Cambridge economists at least, Sraffa was familiar with Pareto's version of general equilibrium theory but thought it too complex for practical applications.⁷⁴ Sraffa's 1960 price theory can be presented as more simple than a general equilibrium theory; demand and distribution are viewed as exogenous, thus as data, each of which is to be determined by different theories.

Then comes the second and better-known part of Sraffa's essay, which does not look at the problem of interdependence but at the problem of market form, locating imperfect competition between the extremes of monopoly and perfect competition. Two conditions have to be renounced: that producers cannot influence prices (they not only adapt by adjusting the quantity produced), and that each producer works under the condition of increasing costs.

Sraffa, first of all, invokes empirical evidence: every businessman will admit that it would be good to increase production and sales because unit costs would then be lower; the difficulty is only that it would not be possible to sell the resulting product without reducing the price or accepting higher marketing costs. Sraffa here warns against mixing marketing with production costs – as later often happened. He then developed a theory about market segmentation. Consumers are not indifferent to the various producers; they are willing to pay a little more to purchase products from a particular firm. Therefore, if a firm wants to increase its market share, it has to expect higher marketing costs. Sraffa analyses the degree of control which a producer exercises on a market segment with the help of demand elasticity and describes what is called today in Germany Erich Gutenberg's price-response-function. Sraffa is aware of the interdependence of demand in various market segments: included in the price-response-function are the alternatives

which buyers have, in that they could buy from less-favoured suppliers. If producers raise their prices, consumers will switch to other producers – if these others also raise their prices, the search will continue and a percentage of consumers will exit the market entirely; this possibility sets the decisive limit to the tendency to raise prices. Lowering the price will attract consumers from other suppliers. In between, there is a price range where a given supplier faces primarily his own customers. This brief presentation includes many additional observations – on asymmetry between price increases and price reductions, for example – so that this essay has been read and re-read for generations.

Pigou felt the need to save the concept ‘supply curve’, which, it would later turn out, had no place in the theory of monopolistic competition. Here the argument was formulated that if relative factor prices remain constant when scale varies, rising costs can be ruled out:

But it is impossible to conceive of any way in which an addition of 10 per cent. to output could require an addition of more than 10 per cent. in the quantity of all the factors at work . . . hence, with this class of commodity, it is impossible for production anywhere to take place under conditions of increasing costs.

(Pigou 1927, p. 193)

Thus, the supply curve cannot rise under the conditions mentioned but can only remain the same or fall, and, if the fall can be ascribed to external savings, a monopoly may be ruled out and the supply curve corresponds to the average-cost curve. The falling supply curve then leads to the sale of a quantity that is less than the social optimum, and therefore Pigou found himself strengthened in his conviction that in this case, it makes sense for the state to intervene (*ibid.*, p. 197).

More recent growth theory often employs the idea, presented as if it were new, that knowledge of technical developments is an external effect of advantage to many branches of industry, making progress without monopolization possible. But this idea was already discussed in the debate on economies of scale.

Pigou (1928) added a more technically advanced analysis of marginal and average cost curves, Shove (1928) presenting mainly technical criticism the same year. Allyn Young (1928), by contrast, did not want to discuss the technical aspects of the curve but instead to add some variations to the great master’s important topic: the treatment of the division of labour by Adam Smith.

Smith overlooked the main point, mechanization, which led beyond the craft division of labour to additional forms: ‘Mr. Ford’s methods would be absurdly uneconomical if his output were very small, and would be unprofitable even if his output were what many other manufacturers of automobiles would call large’ (*ibid.*, p. 530).

Discussion of the division of labour should not be limited to individual firms or even to an industry but should take account of a wider framework. The United States was ahead of Great Britain not because of higher wages or due only to better entrepreneurs, but because it had a larger market. This is defined not so

much by area and population as by purchasing power, which is itself dependent upon production: division of labour leads to further division of labour: 'Thus change becomes progressive and propagates itself in a cumulative way' (ibid., p. 533). The speed of this progress will not increase indefinitely, since people are lazy. Capital accumulation requires time, and every acceleration increases costs. Thus, the expression 'moving equilibrium' seems appropriate to Young. For Schumpeter, in contrast, each technical advance constitutes a small or larger break in development.

Though this part of Young's thinking is today reminiscent of endogenous growth theory and AK models, it can also be observed in other systematic and evolutionary aspects. Potential markets appear to be objects of planning in large industry. It is not consumers of an available surplus product, *à la Marx*, which are sought, but future consumers of potential production. The differentiation of industries and the diversity of products increase. In the wake of the extension of the division of labour, representative firms lose their identity. Firms adapt to local conditions, expand their markets according to the possibilities provided by available transportation, and develop adapted administrative structures. Hence, division of labour and market size are interactive. This broad survey concludes with an attempt at graphic representation in the frame of Paretian indifference curve analysis, introducing a transformation curve that is not convex. The appendix presents a disappointing contrast between a model incapable of development in the form given and the revolutionary ideas which have just been presented.

Most accounts neglect Schumpeter's contribution to the debate, despite his great name and the length of the essay. His theory of development gave him a basis for far-ranging insights, while others concentrated on what appeared to be formal aspects of Marshall's value doctrine. Even in his text and comments, there are interesting technical details embedded in his development concept which remain modern. Whoever is familiar with his conception of development will find it easy to follow his argument. Since innovations originate with entrepreneurs, and since growth and changes in the rate of growth, development, and cyclical fluctuations can be attributed to their activity, the system must be stable so long as innovations are excluded. Thus, for Schumpeter, the question arises whether his theory, focused on a distinction between static and dynamic forces by reference to the activities of entrepreneurs, could have withstood Sraffa's critique of the static foundations of Neoclassicism.

Accordingly, Schumpeter begins as a liberal by saying that most instabilities within the capitalist system derive from misguided political interventions, and he cites as an example (something which would have appealed to Keynes as the editor of the *Economic Journal*) Churchill's attempted return to the gold standard in 1925 by re-establishing the pre-war parity. By capitalism, he means a system based upon private property and production for the market and dominated by a credit system such as first emerged in the eighteenth century. The nineteenth century is called the 'epoch of competitive capitalism' and the twentieth century the 'epoch of organized capitalism' (he used yet other terms, but it is noticeable that he also invokes this term, which comes from Hilferding, Schefold 2000b).

Capitalist organization can be stable without the system itself being stable (specifically, economic cycles disturb it). There are, apart from these cycles, also exceptions in the static domain – for example, the backwards-leaning supply curve for labour leads to unstable equilibria. Schumpeter's further discussion of such instabilities stands out among the usual contributions to the economies of scale debate because he seeks and finds examples which are at once theoretically and empirically relevant. Economies of scale are recognized, but they do not lead – except, possibly, in purely internal cases – to monopolies. Schumpeter displays his wider view of things, by comparison to the students of Marshall, through a discussion of Cournot oligopoly solutions, without, however, acknowledging the possibility of a Stackelberg equilibrium. Schumpeter already referred to the still-unpublished work of Chamberlin. Equilibria are, in themselves, stable; he does not anticipate Stackelberg's objection that through changes in behaviour, unforeseeable switches could take place between the equilibria. Stackelberg's solution, that the corporate state must stabilize the oligopoly equilibrium, would have been all the more foreign to him.⁷⁵

Since inventions in a static system always lead to new data for which new supply curves must be constructed, he can with some justification claim, taking account of observed exceptions, that the system, assumed to be static, is generally stable. The instability of boom and slump arises from growth spurts; growth itself, however, is a result, not the cause, of innovation. While with Young, growth seems to follow quasi-automatically from increasing external returns, the implementation of new factor combinations is here a discontinuous sequence and therefore not to be understood as an equilibrium process. Schumpeter rejects a distinction, attributed to Marshall, between essential and nonessential innovations, which should have helped to avoid the fact that otherwise, every single innovation involves a recasting of the supply curve). Successful renewal always requires the will to renew; it is thus a question of leadership, although in the economic sphere it is mostly a very unromantic process. Markets are not found but created, and the credit system forms the basis for that. In conclusion, the theme of the mature Schumpeter emerges:

Capitalism, whilst economically stable and even gaining in stability, created, by rationalizing the human mind, a mentality and a style of life incompatible with its own fundamental conditions, motives and social institutions, and will be changed, although not by economic necessity and probably even at some sacrifice of economic welfare, into an order of things which it will be merely a matter of taste and terminology to call Socialism or not.

(Schumpeter 1928, p. 385)

Robbins wrote as a London academic and made much of his distance from Cambridge. He returns the debate to a narrower scope, the discussion of the supply curve. Here it is asked what is meant by normal costs at a given level of aggregate output, in view of the variety of firms. Are normal costs oriented to an average or to the cheapest producing manufacturer? For the characterization of

normal costs, Marshall introduced the concept of the representative firm, which had access to the normal technology, enjoyed normal access to the market, and so forth. Robbins thought this term was superfluous, even misleading.

As far as the differentiation between firms can be traced to differences in capital endowment, so that, for instance, firms have access to land of various qualities, these differences are all to be treated as different factors, and there must be a tendency to pay a normal rate and to seek their most favourable combination. But even from a dynamic point of view, Robbins arrives at the same conclusion: when external conditions change, the process of adaptation must ultimately lead, to the extent that real differences exist, to the payment of the factors according to their specific qualities and to reduce costs to this level. Marshall had also recognized this for material factors such as land, where the poorest land determined prices. At root, only the qualities of management were controversial, although here Marshall shrank from proposing a clear distinction of the kind used for lands of different qualities and reverted to average abilities. But it is necessary to differentiate between human qualities just as much as other factors: 'The best lands and the best men are limited' (Robbins 1928, p. 401). Costs in the marginal firms determining prices will thus, to use a modern word, be oriented according to the levels of scarcity of human capital; a representative firm, staffed with employees in theory possessing the same average management qualities, is unnecessary.

Robbins's position might seem mechanistic and elitist, but it did impress by its rigour and with the economic implications suggested by Robbins in his essay. In the symposium, Robertson defended a Marshallian conception of organic growth against Robbins's position, suggesting that industrial equilibria of the kind observed by Sraffa in the case of increasing returns internal to the industry but external to the firm should be compatible with variations in the performance of individual firms. Robertson made use of a fairly diffuse image in an attempt to represent the possibility of a Marshallian competitive process even in the case of internally increasing returns: 'that . . . is where the trees of the forest come in . . . ' (Robertson 1930, p. 88), despite the formal possibility that a monopoly might result while competition survived, because there is no identifiable firm which seeks the monopoly position.

Indeed, Marshall himself had said:

In fact we are verging on the high theme of economic progress; and here therefore it is especially needful to remember that economic problems are imperfectly presented when they are treated as problems of statical equilibrium, and not of organic growth . . . the statical theory of equilibrium is only an introduction to economic studies; and it is barely even an introduction to the study of the progress and development of industries which show a tendency to increasing return.⁷⁶

After a brief discussion, Sraffa answered icily that he had only attempted to work out the assumptions implicit in Marshall's theory; if Robertson viewed this as

unrealistic, he could understand it. Sraffa went on that there was no dispute that this theory cannot be interpreted in such a way that it simultaneously appears logically consistent and consistent with the facts to be explained. Robertson's argument was helped by his leaving the mathematics, and he thought that Sraffa's argument was helped by ignoring facts. Perhaps, Sraffa declared, he should have explained that under these circumstances, it was Marshall's theory that should be discarded.⁷⁷ Shove, in contrast, followed Sraffa by explaining the continuing existence of a large number of firms, even under the condition of increasing returns, with limitations on demand and marketing costs, attempting to describe the competitive process as dynamic and thus leaving behind the old concept of equilibrium.

This momentous debate, which only superficially came to a clear end, simultaneously showed the advantages and disadvantages of education as it took place under Marshall at Cambridge. Students had their own home-grown conceptual apparatus and ambitiously sought to extend it and were prepared to consider suggestions and adopt new ideas so long as they did no harm to their apparatus. Challengers could be effective only if, as with Sraffa, they imitated the language of the school and disguised their contrasting convictions. Schumpeter, who had his own terminology, therefore here found small resonance, as did Young, whose work gained influence only much later when Cambridge economists decided to develop their own theory of growth. While the debate was continuing, Keynes moved increasingly into the focus of the Cambridge discussions. By the time that symposium appeared to have drawn a line under the debate, he had won the circle of students who, in the early 1930s, would help him make a breakthrough with his general theory, which, for its part, would dominate economic thinking for decades.

Antoine Augustin Cournot's *An Inquiry into the Mathematical Principles of the Theory of Wealth* [*Recherches sur les principes mathématiques de la théorie des richesses*]

Antoine Augustine Cournot (1801–1877) is one of the most influential authors in the history of economics. He and his work had an unusual fate. Although the honours Cournot received during his lifetime, as a scholar, a director, and a very senior civil servant, were enough to satisfy any academic, his decisive ideas were not properly appreciated by his contemporaries. The in-depth reception of his major work, *Research into the Mathematical Principles of the Theory of Wealth* (1897 [1837]), which we present here, began only after his death. It would take almost a hundred years before his insights into the laws of imperfect competition would become part of general academic teaching and about 150 years before a new understanding and further development of his work within the context of game theory would set in. The investigation of the relationship between Cournotian and Walrasian equilibria, the inclusion of processes that occur under conditions of imperfect competition into general equilibrium theory – if you like, the combination of Marshall's and Walras's research programmes – is still ongoing.

In hindsight, we can detect in Cournot astounding anticipations of trains of thought that are being developed today.

However, a reader paying close attention to the work will also find a sharp thinker and observer at work beyond the famous and influential chapters on the transition from monopoly to oligopoly and then perfect competition. The value of Cournot's observations lies not only in their obvious exceptional intelligence and intellectual honesty, but also in their peculiar form of rationality, which allows him to combine a theoretical and an empirical perspective. The high degree of abstraction of which he is capable makes him a great theoretical thinker. He was the first economist to make rigorous and consistent use of the differential calculus, mainly for the purpose of determining the consequences of profit maximisation, whereas he did not adopt an analogous approach for utility maximisation. Rather, he occupies a position between Classical Theory and its social explanation of demand behaviour as described by Smith, and Neoclassical Theory, which, following Gossen and Jevons, derives it from the principle of utility. Cournot, more or less, did not take part in the debate over the causes of value, which was so typical for the nineteenth century – rather, he was interested in functional connections. He also takes a peculiar intermediary position with regard to questions of economic policy, for instance, when he questions the doctrine of free trade on the basis of his analysis of customs tariffs.

In the first edition of the *Palgrave Dictionary of Economics* (published in 1894), Edgeworth still asserted that Cournot's *Recherches* remain '... the best statement in mathematical form of some of the highest generalizations in economic science'. For him, the central point is that Cournot began with a definition of the demand curve as a functional relation. Only in passing was Edgeworth then interested in what Cournot had achieved in the theory of oligopolies. What he found striking were conclusions drawn by Cournot from the theory of taxes and customs tariffs. And, finally, he turns to phenomena that appear relatively unimportant to our understanding today, such as Cournot's observations on the effects of monetary value. The following remark by Edgeworth demonstrates how close Cournot was to modern statistical concepts of national accounts and how distant he was from the theory of utility and to attempts at measuring consumer surplus:

He well defines the national income so as to include the wages of the so-called 'unproductive' labourers. He gives formulae for the 'real gain' and 'real loss' in revenue ... In the definition ... abstraction is made of the detriment suffered by those consumers who are deterred by a rise of price from purchasing ... The peculiarity of this definition permits the truth, while it diminishes the importance, of Cournot's paradoxical conclusion that, when a restriction of trade in respect of a certain commodity between two localities is removed, the importing country suffers a 'real loss'.

(Edgeworth 1894b, p. 446)

In *The New Palgrave*, Martin Shubik (1987) covers the book in all of its breadth. In his judgement, Cournot, including the Cournot of the final chapters, which have a

partly 'macro-economic' orientation, is certainly an important theoretical author. However, it is the middle part of Cournot's book whose subject is imperfect competition (in contrast to Ricardo before him and Walras after him, both of whom assumed perfect competition), which he considers of central importance. The discussions of the difficulties in Cournot's solution to the problem of oligopolies after his death do not reach satisfactory conclusions, and an appropriate conceptual framework is provided only by modern game theory. Such difficulties include the fact that sub-sets of firms can form specific coalitions; that not only quantity, but also price can be an action parameter; and that strategic action that anticipates the reactions of competitors can be analysed. And Shubik considers the transition to perfect competition as a particularly striking example of how long it took before Cournot's ideas led to a genuine extension of formalisation: only in 1964 did Aumann suggest a formalised game with a continuum of market participants which presents the idea of the negligible influence of each individual participant in its strict form and which treats perfect competition as a liminal case and not as the basis of the theory. A plausible path from oligopoly to perfect competition leads via the multiplication of market participants. Another path, later explicated by Alcouffe and Frayssé, is based on the relation between the size of the market and that of a given number of enterprises. The fact that larger markets may be closer to competitive conditions can even be demonstrated using the case of a monopoly: if the market shows unlimited growth relative to a single supplier, demand elasticity increases, and the price approximates marginal cost. Finally, however, we must remember that Cournot's analyses are partial. In Ricardian analysis, by contrast, the movement of capital between sectors as an expression of competition is central, so that given low entry barriers, markets were conceived of as – in modern terminology – contestable.

The particular importance of Cournot's partial analyses in this context rests on his reflections on increasing returns. Regarding one essential point, Cournot was ahead of Walras: his theory of imperfect competition permits falling costs or simply the assumption of fixed costs, while Walrasian theory is forced to assume diminishing returns and rising costs. The treatment of general equilibrium theory under conditions of rising returns and indivisible commodities is a topic of modern research.

At this point, we are reminded of the debate on returns to scale which took place in the 1920s in the *Economic Journal* and which culminated in a symposium organised by Keynes. Marshall had tried to play down the element of power in his theory, which resulted from increasing returns to scale associated with imperfect competition. This effect, with which he was familiar from Cournot and which had to be considered unfortunate from the perspective of economic policies, he sought to avoid by moving from internal to external returns to scale. Sraffa's critique of the logical problems in Marshall's approach and the obvious empirical importance of cost degression forced the discipline to confront the difficulties. And, as it turned out, it was essentially Cournot's conceptualisations – such as the price – sales function derived from the demand function, the total revenue and

marginal revenue graph – which, after a hundred years, finally made it possible to realise Cournot's programme within the framework of the Theory of Imperfect Competition. However, of the two main authors who offered a comprehensive presentation of the theory, Edward Chamberlin and Joan Robinson, only the former referred repeatedly and in detail to Cournot's achievements. Following Shubik (1987), we may say of both books that they are mathematically inferior to Cournot. Today, Cournot is acknowledged as a matter of course. As one can see from the *Handbook of Mathematical Economics* (Arrow and Intriligator 1982), a number of concepts in this discipline quite rightly carry his name.

Irving Fisher played a substantial role in making sure that this work of Cournot finally was recognised. In 1897, he annotated the English translation of the book and added an extended version of the 'Bibliography of mathematical economics', which Jevons had begun. This bibliography makes it clear to what extent Cournot is exceptional within the development of mathematical formalism. Although there are early contributions to economics by important mathematicians – Daniel Bernoulli's *Specimen theoriae novae de mensura sortis* of 1738 is a case in point – most of them would not be counted under mathematical political economy and often not even as theoreticians. This makes Cournot the actual founder of mathematical economics. This fact is illustrated by Theocharis's important work on early mathematical economics (Theocharis 1961), the first half of which is dedicated to numerous precursors, while the entire second half is dedicated exclusively to Cournot.

Even before Cournot's collected works appeared in 1973, there had been questions about the importance of his other writings on economics, philosophy, and probability theory, in which he explains his system in less formal fashion. Most historians of economic thought considered them to be weaker, but it should be mentioned that there were voices dissenting from this judgement. Despite all of the importance of Cournot as the discoverer of economic laws: '*... les reflexions qu'il nous livre sur la méthode de l'économie politique sont plus importantes encore*' (Denis 1966, p. 483). This remark by Denis relates to Cournot's *Considérations sur la marche des idées et des événements dans les temps modernes* (Cournot 1872). Denis describes Cournot's methodology as an explicitly Kantian attempt at constructing a 'social mechanics' for industrial societies, in which the majority of individuals increasingly leave behind the original embeddedness of their interactions in biologically inherited and morally informed behaviour and instead follow an economic rationality.

Insofar as we agree that modern theory redeems its claim to be rigorous only to the extent that it is formalised, Cournot's early work must be considered the archetype of modern theory. It is all the more a pleasant surprise to see that he was also capable of presenting problems with elegance. After all, he is the inventor of the original comparison between economists and grammarians: just as grammarians cannot create languages but may only clarify their structures, economists cannot create economic institutions – but they can explain their mutual relationships and thus help avoid their deterioration.

Rudolf Auspitz and Richard Lieben: *An Inquiry into Price Theory* [*Untersuchungen über die Theorie des Preises*]

It is a particular pleasure to include Rudolf Auspitz and Richard Lieben's *Untersuchungen über die Theorie des Preises* [Investigations into the Theory of Prices] (1889) in the *Klassiker der Nationalökonomie*. The importance of this work within the history of economic doctrine is beyond doubt. Auspitz and Lieben made substantial advances in the development and application of partial equilibrium analysis and, via Pareto and Fisher, influenced the further course taken by political economy. The fact that they are less widely read than other founders of the Neoclassical revolution is solely due the fact that the book is not easily accessible. Shortly before his death, the Nobel Prize winner George J. Stigler wrote to our publisher:

The *Klassiker der Nationalökonomie* undertaking to publish reproductions of a wide selection of economic classics in their first editions is unprecedented. It is equally remarkable that the reproductions are presented in handsome, durable form, and accompanied by authoritative essays by contemporary economists. For 25 years I have sought in vain a copy of Auspitz and Lieben.

Unfortunately, Stigler's hope to finally receive a copy of this rare book could no longer be fulfilled. And our hope that he might write a commentary on it to be included in the present volume was thwarted by his death.

Knowledge of the personal life of the two authors inspires the wish to promote their posthumous reputation. The *Untersuchungen* were the product of more than ten years of work by two successful businessmen whose integrity enjoyed general recognition. They were also politically active and ceaselessly pursued cultural and philanthropic aims. Both came from the same Jewish family: Rudolf Auspitz and Richard Lieben were cousins, and Auspitz married Lieben's sister Helene. They lived together in the same house in Vienna, which had been built by Richard Lieben's siblings and their cousin Rudolf Auspitz. Franz Brentano, the famous philosopher and brother-in-law of Richard Lieben, also lived in one of the flats in the house. This Brentano was the nephew of the poet Clemens Brentano and Bettina von Arnim and the brother of the economist Lujo Brentano.

There is a nice book by Josefine Winter, the daughter of Rudolf Auspitz, which describes the life of the family in the house: *Fünfzig Jahre eines Wiener Hauses* [Fifty years of a house in Vienna] (Winter 1927). It is admirable to see how individuals were enabled to develop in both personal and cultural terms by the condition of families living together with the extended family, held together by the Jewish tradition and motivated by the example of artistic and social figures, but also by the economic and political tasks that resulted from the grandeur of Austria's old capital, as well as from the threats it faced. One danced and made music with the others, one read literature aloud to the others – the German classics, Shakespeare, and also more recent playwrights, such as the controversial and admired Ibsen – and political commotions also did not go unnoticed.

Rudolf Auspitz was born in Vienna in 1837. He was the son of the banker S. Auspitz and was the nephew of L. Auspitz, a textile industrialist. Rudolf Auspitz himself was inclined towards the natural sciences, which he studied in Vienna, Berlin, and Heidelberg. However, he subsequently founded and directed a sugar factory in Moravia. He was inspired by the ideas of liberalism and turned first to local and later national politics. In 1873, he was elected to the Austrian parliament. After more than thirty years as a parliamentarian and a member of parliamentary commissions, where he was particularly appreciated for his competence regarding questions of taxation, he was ignored in the election to a commission as a result of, it is assumed, anti-Semitic agitation. This caused him to lay down his mandate in 1905.⁷⁸ He died a year later, in 1906. At his funeral service, the president of the sugar industry emphasised that the deceased had been an opponent of cartels and yet had been forced to be a member of the sugar cartel. The surplus profit he had gained as a consequence and which he considered unjustified, he had transferred to the pension fund of his employees, year by year. Of David Ricardo, to whom Auspitz is occasionally compared, it is also reported that in questions of economic policy, he repeatedly spoke out and voted against his own and in favour of a more general interest in parliament.

Richard Lieben was born in Vienna in 1842. He studied mathematics and engineering in Karlsruhe between 1860 and 1862 and later continued with the study of advanced mathematics. He was an associate of the banking house Lieben & Co., the vice-president of the Austrian Creditanstalt für Handel und Gewerbe [Credit Institute for Commerce and Trade], and the president of the old Vienna Handelsakademie [Academy of Commerce], apart from various other offices and functions in public and private societies. He also promoted the daring plan to connect the capital city Vienna with the only Austrian port in Trieste via a canal across the Alps made up of a system of watergates and tunnels.⁷⁹ Lieben was actively engaged in questions of monetary policies but was generally considered to be modest and inclined towards a withdrawn life, to which he added some splendour in the form of a fine arts collection.

In addition to their major work, Auspitz and Lieben also wrote several accompanying articles in support and defence of it, among them, for reasons of priority, an earlier version of the first chapter of the book (1887). In 1890, Auspitz attacked the Classical Theory of value, which by that time existed only in a very degenerate form.⁸⁰ Dietzel had watered down the Ricardian theory to such an extent that it had become impossible to defend it. Of more importance are the polemical exchange with Walras about the legitimacy of partial equilibrium analysis and Rudolf Auspitz's engagement with Böhm-Bawerk.⁸¹ In the context of the latter, Auspitz wanted to demonstrate the legitimacy of the mathematical approach which Böhm-Bawerk, who otherwise agreed with Auspitz and Lieben as far as the role of marginal utility in determining value is concerned, did not want to make part of the foundation of the theory.⁸² Of Lieben's other writings, one deserves particular mention: after Rudolf Auspitz's death, he took up the controversy with Walras once again, this time conceding one specific point. He acknowledged that the curves of supply and demand for the same item may intersect more than once.

The analytical quality of this contribution testifies to the fact that the younger of our two authors was equal to the older one.

The specific method of Auspitz and Lieben was rarely used in later times, with the exception of the great Classical author of the Russian school, Dmitriev.⁸³ A reader of their book today should ask what the rise of the mathematical method in political economy meant for the Neoclassical revolution. On one hand, the two developments do not entirely overlap; after all, mathematical formulations can also be found in classical political economy. On the other, resistance against mathematical methods towards the end of the nineteenth century came out of not only the Historical School, which, lest we forget, also counted important statisticians among its members, but also the Austrian School.

The reader will be pleasantly surprised to hear that despite the confusing tangle of polemical reactions which the *Untersuchungen* had to face and the further controversies in which they were at least indirectly involved, the main part of the book is clearly structured and easy to understand. One need only follow the example of Walras (1890, p. 320) and Pareto (1952, pp. 15–53), and first come to terms with the concept of a ‘derived’ curve, which is peculiar to Auspitz and Lieben.

Auspitz and Lieben represent the monetary costs for the production of a good and the monetary utility of its consumption within a single diagram, with the abscissa giving the amount of the good and the ordinate axis the monetary value. For the next step, the concept of the ‘derived curve’ is required. This curve is defined by the characteristic that a ray from the origin to any point of the derived curve has, at every point of the abscissa, the same gradient as the original curve. Therefore, if $K(q)$ is the original curve and $z(q)$ the derived curve, then $z(q)/q = K'(q)$, or $z(q) = qK'(q)$. The derived curve in the sense of Auspitz and Lieben thus equals the derivative, the derived curve in the mathematical sense multiplied by the value of the independent variable.

The interpretation is simple: in our diagram, which measures the amount of a good on the abscissa and the monetary value on the ordinate axis, a ray with constant p through the origin pq can be understood as giving the sales volume of an increasing volume of a good q at a constant price p . If we interpret $K(q)$ as a cost function, the well-known condition of the coincidence of the price p and the marginal cost K' under conditions of perfect competition in this case must be given as $z(q) = qK'(q) = qp$. In the case of perfect competition and a given price p , the production volume is given in the diagram as the intersection of the ray with the gradient p moving through the origin and the derived curve $z(q)$.

An analogous observation can be made for the consumer side. In the case of a utility function $N(q)$ with a derived curve $y(q) = qN'(q)$, an equilibrium presupposes a coincidence of price and marginal utility, hence $p = N'(q)$, and for the derived curve $y(q) = qN'(q) = qp$. In reverse, for the market as a whole, the intersection of the derived curve of the aggregated utility and cost curves indicates the price. The corresponding diagram – though using their own terminology – can be found in Auspitz and Lieben (1889) on p. 17. This should be compared to the case of a pure monopoly presented on p. 362: here, the difference between proceeds and costs – i.e. in accordance with their notation, between the derived

curve $y = qN'(q)$ and the costs $K(q)$ – is maximised. The monopoly price is given by the gradient of the vector ray connecting $y(q)$ with the origin.

Once we have thus clarified the relation between the analytic method of the *Untersuchungen* and conventional microeconomics, the further elaborations are easier to follow.

Pareto defended the authors against Walras's accusation that the *Untersuchungen* are too limited to partial equilibrium analysis by comparing partial analysis to the treatment of planetary motion as a two-body problem in astronomy and general equilibrium theory to the treatment as a three-body or many body problem (Pareto 1952, p. 26). The parallel is illuminating, although it is not a perfect one. Pareto himself says: '*Abbiamo alcun che di simile in astronomia*' [Astronomy provides us with a certain analogue.] On one hand, the two-body problem assumes that there are two masses and then determines their orbits as a result of their mutual gravitational attraction. This approach corresponds not so much to partial equilibrium analysis as to the description of the dynamic in two interconnected markets, if there are only these two markets, i.e. for instance, the production of a good with one factor. If, on the other hand, a particular problem in astronomy – such as the Moon's orbit around the Earth – is treated as a two-body problem, the advantage is not that the values for the general equilibrium are considered as given, as one does in the theory of partial analysis (which assumes the prices of other markets), but that the differential equations describing the two-body problem allow exact calculations with the help of integrals, while even in the case of a three-body problem, solutions can be given only in the form of convergent series, necessitating tedious approximations in the course of concrete calculations. Until fairly recently, the objective in partial equilibrium analysis was nothing but the formulation of correct equations and finding solutions (first made plausible by counting the unknowns and the independent equations, later by genuine proofs). Given the myriad individual equations, economists did not dare attempt concrete calculations, as astronomers did when determining planetary orbits. Even today, with the use of powerful computing facilities, such calculations are only possible in economics when the equational systems are strongly simplified.

Thus, at the beginning of general equilibrium theory we do not find problems concerning calculations, as Pareto's simile might suggest, but conceptual ones: How can the conditions of general equilibrium be formulated in such a way that the principles of the mutual determination of economic values become visible? Partial equilibrium analysis may prepare the ground for an understanding of the general theory of equilibrium, but it does not anticipate the theory itself. It reduces the foundational problem by anticipating a simplification that is empirically useful when, for instance, by assuming the marginal utility of money to be a constant, it provides an approximation for a fundamental relationship, such as the analysis of the connexion between the purchasing power of income and changes in relative prices. This is how Auspitz and Lieben proceeded, and, what is more, they were aware of the influence exerted by changes in the marginal utility of money and added an analysis of that. However, it is understandable that

Walras was proud of his earlier exposition of the fundamentals of general equilibrium theory and was under the impression that Auspitz and Lieben did not fully appreciate the importance of his theoretical achievement in the way that they proceeded.

From today's perspective, however, what is fascinating is precisely the stringency with which Auspitz and Lieben construct their partial analysis and only gradually reveal its fundamental limits. Their presentation shows that an abundance of concrete insights into the dynamic of markets characterised by special conditions of production or consumption can thus be treated and explained in theoretical terms. The wealth of observations concerning economic sociology that form part of this presentation seem to be particularly worth mentioning. What can be called elastic and inelastic demand in the tradition of Marshall is, for instance, being discussed in connection with the rise and fall of the profit curve. At this point, Auspitz and Lieben do not just provide an analytic determination of elastic and inelastic demand behaviour as an equivalent to the definition of price elasticity. Rather, they aim to demonstrate the conditions that lead to the one or other form of behaviour. They refer to the role that necessary and luxury goods play in households from different social strata of the population; they talk about what today we would call the life cycle of products and about technological progress. In another passage, they include joint production in their argument by letting the proceeds from the sale of secondary products reduce the cost of the production of the main product, and they formulate hypotheses on the changes in the output quantity of the secondary product in relation to changes in the output quantity of the main product. The analysis of indirect taxation and customs duties plays an important role.

It is difficult to say whether Auspitz and Lieben consciously displayed the rich empirical substance of their partial analysis in order to prove, at a time when the Historical School was dominant within German-speaking countries, that a theoretically grounded political economy does not necessarily have to remain silent about the real world. Even if they ignored the requirement put forward by the Historical School of doing justice to the specificities of the economic forms of different historical epochs, they nevertheless succeeded in elegantly providing that proof for their own times. Although they did not attempt to combine analytic economics with a theoretically grounded sociology, as Pareto would later do, they magnificently combined an original foundation for the principles of applied economics with reflections on economic policy.

Notes

- 1 Cf. on this the remarks from R. D. Collison Black in Jevons (1970 [1871], p. 267, note 35).
- 2 For his viewpoint, Marx cites a physicist: 'The amount of labour which a man had undergone in the course of 24 hours might be approximately arrived at by an examination of the chemical changes which had taken place in his body, changed forms in matter indicating the anterior exercise of dynamic force' (Marx 1977a, p. 664).
- 3 Cf. Schefold (1987).

- 4 Cf. Annex to Keynes (1972 [1951], p. 151).
- 5 Cf. on this point Theocharis (1961), and for the German development: Baloglou (1995).
- 6 Particularly in the third volume of *Papers Relating to Political Economy* (Edgeworth 1925; repr. New York: Burt Franklin, n.d.), the collected reviews bear witness to this. Alongside English, French, and Italian works, numerous German texts are also mentioned and even the new Greek financial history from Andreades, still famous today. Edgeworth also explored the works of the Historical School; however, he was less interested in their questions than was Marshall.
- 7 In his review of *Mathematical Psychics*, which appeared already in June 1881, Marshall also pointed out the importance of Edgeworth's remarks on the uncertainty of employment market contracts and admired the 'brilliancy, force and originality' (Marshall 1975, p. 267) of the analysis.
- 8 Cf. 'Heinrich von Stackelberg's concept of equilibrium: the search for evolutionarily stable market behaviour', present edition, pp. 332–345
- 9 The outcome is viewed more positively today than by Keynes. On Edgeworth's later contributions to the theory of index numbers and his efforts toward the measurement of use and probability, cf. the entry on him by C. Hildreth (1968) in *International Encyclopedia of Social Sciences*. 'Edgeworth's plan, . . . was to do at last what had been talked about and assumed possible for over a century but had never been accomplished: adapt the statistical methods of the theory of errors to the quantification of uncertainty in the social, particularly economic, sciences' (Stigler 1978, p. 295).
- 10 G. Debreu's and H. Scarf's essay 'A Limit Theorem on the Core of an Economy' (1963) begins with a thorough history of theory reference to Edgeworth. Incidentally, it refers to the appendix of Creedy's (1986) book, which contains comments on *Mathematical Psychics* that, naturally, are not always philologically precise themselves, with translations and references to foreign language citations and corrections of confusing printing errors in the formulas (*ibid.*, pp. 135–50).
- 11 According to Keynes (1972 [1951], p. 262): 'Far from rising from the monograph to the treatise, moving to the opposite extreme from Marshall's, he sank from the monograph to the paper, essay, article, or transaction. For forty years a long stream of splinters split off from his bright mind to illumine (and to obscure) the pages of the *Statistical and Economic Journals*'.
- 12 Republished in the *Works of K. Marx and F. Engels* (MEW), vol. 26 in three parts, using photocopies of the original handwritten version, Berlin: Dietz, 1965–68.
- 13 Cf. Yagi (1983).
- 14 Letter from C. Menger to Böhm-Bawerk dated 13 November 1884 (*ibid.*, p. 36, my transl.).
- 15 Cf. 'Eugen von Böhm-Bawerk's *Positive Theory of Capital*', present edition, pp. 200–216. In addition, 'Irving Fischer's *The Nature of Capital and Income*', present volume, pp. 216–229.
- 16 In later editions, Walras defines amortization and risk as rates, not absolute terms, cf. Walras (1965, p. 586).
- 17 Cf. related to this, my review (Schefold 1993a).
- 18 Cf. on the following, the 5th section, 'The Division of Profit into Interest and Profit of Enterprise', in vol. III of *Capital* (Marx 1990).
- 19 Cf. in particular Eltis (1993).
- 20 Cf. 'Eugen von Böhm-Bawerk's *Positive Theory of Capital*', present edition, pp. 200–216. In addition, 'Irving Fischer's *The Nature of Capital and Income*', present volume, pp. 216–229.
- 21 The publication history is provided in the foreword to the fourth edition and the accompanying forewords to the earlier editions. Cf. Böhm-Bawerk (1961). For an English translation, see Böhm-Bawerk (1957).
- 22 *Ibid.*, vol. 1, p. XV.
- 23 Cf. Feess-Dörr (1989).

- 24 According to a classic notion (which Marx adopts here), supply and demand determine only the direction of the movement of the market prices. When the supply is 'greater,' the market price sinks; in the opposite situation, it increases. Equilibrium itself must be determined differently: by long-term, 'normal' costs. Böhm-Bawerk provides a different illustration in the following example. When the weight on a block and pulley is stronger than the force pulling it, it sinks; otherwise, it rises. In equilibrium, no movement takes place, and it does not matter how long the rope is or how high the weight is. The length of the rope is, therefore, not determined by equilibrium.
- 25 Schefold (1989a, pp. 284–95) offers a description of the main arguments.
- 26 Irving Fisher (1907), in a direct reaction to Böhm-Bawerk, already recognized: 'There are . . . just as many rates of interest in goods as there are forms of goods diverging in value.'
- 27 Cf. Samuelson (1990, p. 323f.). More than other advocates of the general equilibrium theory, Samuelson stresses the importance of 'permanent states.'
- 28 The founder of the theory, however, disagrees in Ramsey (1928).
- 29 The dissertation, submitted to Yale University in 1891, was printed in *Transactions of Connecticut Academy*, vol. IX (1892). There were reprints in 1925 (Yale: University Press) and in 1965 (Kelley: New York).
- 30 Significantly revised and published as *The Theory of Interest* (1930).
- 31 This connection, thoroughly and empirically investigated by Fisher, is analysed in Gebauer (1982).
- 32 Present volume, pp. 200–216.
- 33 Cf. Sraffa (1960, App. D 3).
- 34 Cf., for example, Schefold (1989a, p. 15).
- 35 Böhm-Bawerk (1961, vol. II/2, p. 71).
- 36 $1/(1+R)$ is the dominant eigenvalue, which, for the sake of simplicity, is assumed for the indecomposable semipositive matrix A . If $R > 0$, for each r with $0 < r < R$ there is a positive number $N(r)$, so that $(1+r)^n > n$ for all $n \geq N(r)$ is valid and the series (I) for $n \geq N(r)$ is a majorant series for the series in the numerator of (II). If, conversely, $R \leq 0$, then the denominator of (II) diverges.
- 37 Cf. on this point Sraffa (1960).
- 38 I remember from a discussion in 1973 that Sraffa was familiar with Fisher's theory. Unfortunately, I do not know whether he had studied that concrete example.
- 39 Cf. Samuelson (1966a).
- 40 The exposition of the conditions for an equation for a long-term equilibrium serve only scientific criticism and in no way prove that such conditions can be attained in our unpredictable world. It certainly provides no proof that efficient economic planning would be possible on this basis.
- 41 Cf. also Fisher (1907, p. 359).
- 42 The Fisher Diagram is a history of economic thought perspective discussed in Blaug (1978, pp. 561 sqs).
- 43 This is somewhat more thoroughly explained in my commentaries on Böhm-Bawerk in the present volume, pp. 188–216.
- 44 Milgate suspects this and therefore credits Hayek with influencing Malinvaud's (1953) work mentioned previously. Lindahl may perhaps have been more important.
- 45 Cf. Malinvaud (1953).
- 46 Böhm-Bawerk 1961, vol. II/2, p. 112. From Sraffa's introduction to Ricardo's *Principles* we know, however, that the consideration of how the movement of absolute and relative prices are represented in the function of the profit rate does not originally come from Mill. It belongs to the original core of the tradition of Ricardian thought.
- 47 This is developed in Schefold (1971 and 1980).
- 48 Cf. Pelligahr (1993).
- 49 In addition, x_i is the eigenvector, f_i the eigenvalues of the irreducible, semi-positive matrix A . For the sake of simplicity, they are also different according to modulus;

the dominant eigenvalue is $f_1 = 1/(1+R)$ and $\mathbf{x}_1 = \mathbf{p}$ is the eigenvector which belongs to it. Then \mathbf{p}_0 is a linear combination of the \mathbf{x}_i and

$$(1+R)^t \mathbf{A}^t \mathbf{p}_0 = (1+R)^t \mathbf{A}^t \sum_i c_i \mathbf{x}_i = \sum_i c_i (1+R)^t \mathbf{A}^t \mathbf{x}_i = \sum_i c_i (1+R)^t f_i' \mathbf{x}_i.$$

For large t the right side converges to

$$c_1 (1+R)^t f_1' \mathbf{x}_1 = c_1 (1+R)^t / (1+R)^t \mathbf{p} = c_1 \mathbf{p},$$

since $|(1+R)f_i| < 1, i = 2, \dots, n$.

- 50 Cf. Irving Fisher's "*The Nature of Capital and Income*", present edition, pp. 216–229
- 51 I thank Robert Dorfman for this citation and for other information.
- 52 'I for one am convinced that one either must provide rigorous theories or empirical formulas based on the experience, but that one absolutely must ban from science those arguments which lend a superficial appearance of truth to false theories' (my transl.).
- 53 Cf. Garegnani (1989). Schumpeter conceals the capital theoretical problem when he writes, Pareto's 'theory of capital and interest derives all its merits from that of Walras' (Schumpeter 1951b, p. 123).
- 54 Cf. the late essays, letters, and notes in Busino (1974).
- 55 Cf. Ingrao and Israel (1990, p. 130).
- 56 Cf. Malinvaud (1992).
- 57 Cf. Walker (1987).
- 58 Cf. Marchi (1987).
- 59 On the inconsistency of individual behaviour, cf. Krause and Steedman (1986).
- 60 Cf. Mangoldt and Knopp (1961, p. 443).
- 61 Cf. Erwe (1961, p. 46).
- 62 Around the time of the composition of the *Manuale* came the general formulation of the theories named, in the two- and three-dimensional cases, for Gauß and Stokes (Klein 1927, p. 90).
- 63 The remarks made by the editor preface the three concluding essays: Robertson (1930), Sraffa (1930), and Shove (1928).
- 64 For an English translation of Sraffa (1925), see Eatwell and Roncaglia (1998).
- 65 Marshall's late work is rarely read today. Cf., however, Caspari (1996).
- 66 The essay is discussed in detail in Schefold (1976a and 1989a).
- 67 I think it is a mistake and an omission that an English translation of the essay from 1925, which had existed for about 20 years, took so long to appear in print.
- 68 In a letter to the writer dated 27 May 1997.
- 69 Cf. Sraffa (1925); Eatwell and Roncaglia (1998, p. 327 sq.).
- 70 Cf. Eatwell and Roncaglia (1998, p. 351 sq.).
- 71 Sraffa's 1960 book, *Production of Commodities*, in contrast, takes the amount to be produced as data for the fixing of prices.
- 72 It is even narrower than the modern understanding of Classical Theory. Sraffa's 1960 book emphasizes even in the introduction that the price theory presented in *Production of Commodities by Means of Commodities* does not assume constant returns. Sraffa's unpublished papers have not been explored sufficiently for us to know if he was already aware of this in 1926.
- 73 I became involved in a controversy with Samuelson because he had suggested 'Sraffa's purported demonstration that the category of *constant* competitive cost constitutes the only empirical box with appreciable content . . . is plain wrong.' (Cf. Samuelson (1992 [1990], p. 268.) Samuelson added an example that was pure Marshallian and was supposed to refute this. It was a question of different industries, each of which wanted to use a specific factor. As did others, I was easily able to show in my 'Comment' (on pages 301–17 in the same volume) that just this case was already seen

as an exception by Sraffa (thoroughly discussed, however, in the 1925 essay), thus confirming the rule.

74 Cf. Roncaglia (1975, pp. 17–21).

75 Cf. 'Heinrich von Stackelberg's concept of equilibrium: the search for evolutionary stable market behaviour', present edition, pp. 332–345

76 Following this is the reference to the famous appendix H, which contained Marshall's (1966, p. 382) controversial confrontation with the problem of increasing returns.

77 A paraphrase of the closing remarks: Sraffa (1930, p. 93).

78 See Winter (1927, p. 95).

79 For biographical details on Rudolf Auspitz's and Richard Lieben's scientific activities, see Weinberger (1931).

80 Cf. Auspitz (1890).

81 Cf. Walras (1890). The issue also contains the reply by Auspitz and Lieben, pp. 599–605.

82 Cf. Auspitz (1894).

83 Cf. Schefold (1992a).

Institutionalism

Gustav von Schmoller as theoretician

1. *Schmoller's theoretical aims*

Schmoller a theorist?¹ It is very common today to see Schmoller as a typical adversary of economic theory. As the Historical School waned, its intellectual legacy was increasingly forgotten in the Federal Republic, and there is an inclination to consider historicism as an 'anti-theoretical' movement. This view overlooks the fact that Schmoller did not at all see himself solely as a historian of economics, but also as a theorist. In the preface to his *Grundriß*, he remarks that he always 'felt it to be an unjustified criticism that he only strives for description, not for general knowledge of the laws in economic life' (Schmoller 1904, p. VI). And Spiethoff, his assistant over many years, maintained that Schmoller 'ultimately was only ever interested in theory' (Spiethoff 1938, p. 400). We should also note that within the context of the *Methodenstreit* [Dispute over Methods], Menger and Schmoller never doubted each other's theoretical intentions. The only point of contention was over the correct method that should inform theoretical analysis. And even in this context, the image of Schmoller that is so firmly anchored in many people's minds and which sees him as a strict opponent of theoretical deduction stands in need of being corrected. Schmoller, at least, would not have considered himself an opponent of the deductive method. Rather, he was of the opinion that deduction and induction form part of scientific thinking, and that they are as indispensable 'as the right and left foot for walking' (Schmoller 1898a, p. 293).

Schmoller rejected what he called 'isolating abstraction,' by which he meant the construction of abstract theories on the basis of empirically questionable axioms which have lost all contact with the reality of economic life. His goal, by contrast, was to develop an intuitive theory based on broad empirical research. An economic theory along the lines envisaged by Schmoller must take into account the specificities of historical developments and the close connections between economic, social, and cultural factors. He represented a conception of theoretical macroeconomics with an orientation towards the political and social sciences. 'What Schmoller ultimately aimed at was nothing less than an explanation of the entirety of social life on the basis of an evolutionary, interdisciplinary economic theory understood as a theory of culture' (Dopfer 1988, p. 556, my transl.).

Although the *Grundriß der allgemeinen Volkswirtschaftslehre* [Outline of a General Political Economy] is a far stretch away from this ultimate goal, it is a

theoretical work in the sense expressed in this quotation. The *Grundriß* complements the analysis of economic phenomena with rich historical illustrations and genealogical accounts of the investigated phenomena. Special attention is given to the geographical and national peculiarities of individual economies.

As a consequence, Schmoller differs from the opposed School of Marginal Utility not only in terms of the way he proceeds and his form of presentation, but also in terms of his themes: because the economy interacts with historical cultural development, on one hand, and with natural and technological conditions, on the other, Schmoller presents reflections on, for instance, the reciprocal effects of political and religious history in late antiquity (which he captures with a masterly stroke), as well as on dubious racial theories and on the history of technology. All these are not to be taken as pure excursions from the main argument; rather, they provide the testing ground for historical understanding. Schmoller presents a history of technology from an economic perspective, not from that of an engineer. In his not always entirely clear systematic ordering, the 'psychological, moral, and legal foundations of political economy' stand programmatically at the beginning of his approach. From this starting point, he wants to show how economic acquisitiveness and self-interest are fruitful and determining forces, but only if they remain tied into the sub-systems of morality and law, the interaction of which he analyses in a highly differentiated fashion.

Schmoller believed neither in a natural order of society nor in the possibility of its spontaneous ordering through contracts. Rather, age-old moral traditions, which are subject to repeated transformations, and a strong independent legal system emerging from them, which provides a minimum of ethical substance, form the framework of even modern society. He was sceptical about liberalism and secularisation because he saw acquisitiveness as a force to be tamed, whose excess had been lamented as early as Aristotle. Behind the economic activity conditioned by norms (as a 'second nature' of man) are drives and needs that are themselves culturally mediated. 'The continuous, fixed adaptation of our nervous system to an increasingly complex apparatus for the satisfaction of needs is the catch which prevents mankind from falling back into barbarism' (Schmoller 1900, p. 25).

Authors such as Bentham or Jevons, in his eyes, provide only 'commonplaces' for an understanding of the satisfaction of needs. Faced with a milieu threatened by social tensions and intellectual doubt, Schmoller placed his hopes on a cultural evolution supported by moderate social policies, something we must today view with scepticism. And the principles of his theoretical approach were meant to provide the foundations for such policies.

Prior to the publication of his *Grundriß*, Schmoller had spent most of his academic life writing historical monographs. In his detailed empirical research, he wanted to collect the historical material that was to form the basis of the economic theory he was about to formulate. The *Grundriß* was designed as a first attempt at supplementing the historical material at his disposal with a theoretical framework, something that came as a surprise to his pupils and contemporaries. Schumpeter (1926, p. 354) called the work a 'summarising mosaic'. Even Schmoller himself again and again pointed out the imperfection of this attempt.

I wanted to liberate political economy from false abstractions with the help of exact historical and statistical economic research, and yet at the same time remain a generalising state and economic theorist to the extent that today, according to my opinion, there is already solid ground available for such theorising. Where it seemed to me to be lacking, I preferred even in the *Grundriß* just to describe the facts and to hint at a few developmental principles, rather than to construct airy theoretical edifices which have no contact with reality and soon collapse again like so many houses of cards.

(Schmoller 1904, p. VI)

Given this as the point of departure, we should not expect to be able to give a sharp definition of the object and method of Schmoller's theory. But in the following section, we shall at least make a partial attempt at assigning it a place within the scientific developments of his time, before discussing individual aspects of the theory in the following sections.

Schmoller's overall approach has been called 'a social economy,' but this expression does not yet provide an explanation of the interdependence of economy and society, and it also does not cover all of Schmoller's work, which includes reflections on technology and on the natural basis of economic activity. We can be certain that Schmoller did not approach his material without certain presuppositions in mind. He was clearly guided by theoretical ideals, as demonstrated by his numerous remarks on the history of economic doctrine. His inductivism does not entail the naïve assumption that scientific observations are possible without being guided by concepts.

The significance of individual problems in economic theory, such as that of price formation, takes second place to the also theoretical question of how the interaction of the sub-systems of economy, society, and culture should be analysed. Their co-existence means 'that the individual and almost any of its acts represent an intersection of these. One and the same action can have an economic, moral, legal, etc. aspect' (Schmoller 1883, p. 255). We are faced with a hermeneutic circle: the understanding of an individual aspect and the knowledge about the overall context necessarily condition each other. Schmoller's restraint regarding the formulation of general hypotheses and his inductive procedure are evident in this context as well: he tries to prepare a synthesis of economic and social theory from a historical perspective, but he does not provide it himself, at least not in the form of a coherent system. Instead, he chooses to take a peculiar middle path between pure theory, which presupposes some generalities in the form of its assumptions, and a historical method which illustrates these generalities with individual cases.

2. Historical method in economics and historicism in the human sciences [Geisteswissenschaften]

Schmoller further justified his approach to economics with reference to successes of the historical perspective in the human sciences, and, especially in his dispute with Menger, with reference to the philosopher Dilthey.² Let us quickly take a look at this

little-known connection, not because of its epistemological relevance, but rather because it allows us to situate Schmoller within the broad movement of historicism within the German human sciences, which included legal and cultural studies.³

Within the triumvirate Menger-Schmoller-Dilthey, Menger represents the position of pure theory, which would later come out victorious, while Dilthey represents the position of reflection on the purpose and aim of the best work done in the human sciences in Germany. Schmoller's failed attempt at establishing a school of thought between the two, which would outlast him, carries a significance that exceeds the limited period of the *Methodenstreit* [Dispute over Methods].

In the first place, the opposition between Schmoller and Menger became so pronounced because, as a result of increasing specialisation, the historical and theoretical methods were about to drift further apart in their time, compared to the previous decades. And within the same period of time, a momentous change in theoretical orientation also took place. It is easy to show, using the works of, for instance, Smith and Mill, that Classical political economy takes the institutional context into account far more so than Neoclassical Theory. Although we may juxtapose Marshall or Schumpeter, as historically well-versed representatives of Neoclassical Theory, to these two, such a confrontation only demonstrates what has changed: through the subsumption of the laws of distribution under supply and demand, as well as of the satisfaction of needs under utility maximisation, the space, which in classical political economy had been occupied by the description of historically changing laws of distribution, employment, and the development of consumption, has disappeared. In 1885, Sidgwick remarked,⁴

With the more moderate claims of the historical method as set forth by the distinguished leader of the school, William Roscher, the English economists who maintain the tradition of Adam Smith and Ricardo have no sort of quarrel. He has sought, as he says, 'gratefully to avail himself' of the results of Ricardian analysis, and we can no less gratefully profit by the abundant historical researches that he has led and stimulated.

(Sidgwick 1962, p. 86)

Supplementing the 'open' classical model with assumptions that corresponded to the development of national economies was characteristic of the century between Quesnay and Mill. Sidgwick still belonged to this tradition. The decline of the Classical School facilitated a theoretical eclecticism of which Schmoller, as we shall see when looking at concrete examples from his work, made good use in his attempts at connecting theoretical and historical perspectives. However, it was no coincidence that the confrontation between these areas intensified only from 1870 onwards, with the clearer formulation of the Neoclassical paradigm. In parallel, historical knowledge had increased tremendously. New historically oriented disciplines emerged, such as art history. At the same time, attempts at synoptic perspective developed, of which the Historical School of political economy was only one expression. Only very little of these attempts at a synthesis survived, and the individual parts easily entered into new contexts. The result of these processes,

as far as the Historical School of political economy is concerned, is well-known: its work and results were not lost, but rather were taken up by younger disciplines – in particular, economic history, sociology, and the sociology of economics. Max Weber and his towering influence must be mentioned first of all in this context. Recently, Wilhelm Hennis has demonstrated that his work was rooted in the Historical School to an extent we would not expect today (Hennis 1987).

Dilthey was the preeminent thinker of a synthesis and of the inner connections within the human sciences as they were practiced in Germany, in exemplary fashion for Europe at the time. Schmoller's references to Dilthey were questionable for two reasons, though: on one hand, Dilthey seems hardly to have been aware of those aspects of economics which are closer to the natural sciences than to the human sciences, and on the other, I have doubts about the extent to which Schmoller deserves to be subsumed under the tradition of the human sciences which Dilthey describes and continues, although such a subsumption may be more easily justified in the case of successors such as Gothein or Sombart, who wrote in the 1920s when Dilthey's influence had reached its peak.

Schumpeter (1954, p. 777) spoke of Dilthey, in an unusually respectful tone for him, as an exceptional philosopher and 'master of wide domains'. But he considered the line Dilthey draws between natural laws and social development to be artificial because 'great parts of the social sciences ride astride this dividing line which in fact seriously impairs its usefulness (although for the truly philological-historical disciplines it does retain validity)'. Schumpeter then goes on to discuss Dilthey's distinction between the *explanation* of natural phenomena and the *understanding* of cultural phenomena. The double aspect of economics can, indeed, be illustrated by the fact that we *understand* the preconditions of an economic theory, for instance, of investment behaviour (Keynes's 'animal spirits'), while analytically deriving conclusions from it, hence *explaining* something with it – for instance, the level of employment. The persuasiveness of the formal explanation depends on support from a reconstructive understanding of the preconditions, especially if the theory's capacity for making successful prognoses does not suffice for its justification.

While it is true that the deductive element is not very pronounced in Schmoller's theoretical thought, he nevertheless differs from Dilthey's method in the human sciences, insofar as developments in intellectual history play only a subordinate role in his understanding of historical processes, while natural factors and political forces are emphasised more strongly. Both thinkers, however, meet in the significance they attach to psychological dispositions as factors in the explanation of human behaviour and cultural achievements.

Dilthey's point of departure consisted of observations on the intellectual movement which began in the German Enlightenment with Lessing, reached its peak in the classical period, and found a preliminary end in the works of the great idealist philosophers (Schleiermacher and Hegel). One of Dilthey's first achievements was to understand this intellectual movement as a totality. The phases of this movement, for him, found their most important and decisive expression in creations of the arts. He considered the philosophical systems of Schelling, Hegel,

or Schleiermacher as only the logical and metaphysical foundations and forms of the philosophy of life and the view of the world held by the poets – first of all, Goethe and Schiller.

In a way that is difficult to understand from today's perspective, Dilthey's inaugural lecture at the University of Basle in 1867 emphasised the importance of poetry as the highest expression of human life and culture, as embodied in the work and life of Goethe in a way that attracted a unique interest in the educated public of his day. Dilthey, himself one of the best interpreters of artistic works, would later define the object of the human sciences as the 'objective spirit' (Hegel's term) that encapsulates the creations of spirit. For him, the comparative study of literature, for instance, is less concerned with the inner development of individual writers than with the context which they create and which becomes independent of them. The human sciences reach as far as the understanding of this context, an understanding which is concerned with the creations of spirit (Dilthey 1961, p. 299). By enriching life with these creations, the human sciences contribute to the education and formation of the public. Dilthey considered the unity of the human sciences thus conceived not so much as a programme, but rather as a fact that had been established by research in Germany during the first two-thirds of the nineteenth century. The ultimate foundation for this research, thus, is to be found in the classical period of German literature. Despite the gradual transformation of the idealist beginnings into the academic routine of university education and the resolution of research into the individual disciplines of history, art history, and literary criticism, and so forth, Dilthey held on to his vision of the unity of the human sciences.

I shall venture only a preliminary answer to the question of the extent to which Schmoller's work fits into the framework provided by Dilthey. Due to the synoptic aspiration of the *Grundriß*, the work only exceptionally allows Schmoller to follow Dilthey and represent social and political conditions by delineating the general significance of an individual process or life (Lessing 1988, p. 129), the way that a historian sometimes describes an epoch through the characterisation of *one* personality. Only exceptionally (for instance, in textbook passages) does he treat intellectual history as an independent subject of research.

One may also ask, following Salin (1967, p. 140), which connections existed between Schmoller's sociological orientation, the juridical orientation of Knapp, and the cultural one of Gothein, with respect to the historically conceived political economics of the three. It is obvious what kind of theory they rejected and which policies they pursued. It is easier to associate Gothein or even Sombart with Dilthey's programme, rather than Schmoller – Gothein because of his relationship, in his life as well as work, with general history and art history; Sombart because of his efforts at combining empirical illustration and theoretical elements, in order to define economic systems in a fashion that evokes a vision of their cultural unity or individuality. This aim of his becomes even clearer in later times when he introduces the concept of an economic style, as it was more clearly defined by Spiethoff. This development suggests that Dilthey's understanding of history should have ended in a combination of economic and cultural history, as it was developed by Jacob Burckhardt. However, despite efforts from both sides at understanding the

historical expressions of 'the nature of human drives' (Hardtwig 1988, p. 109), such a combination never quite came about. Part of the reasons for that may coincide with the reasons why we find it difficult to consider economics as a part of Dilthey's human sciences at all. It is still controversial today whether the notion of a style can be applied to the sphere of economics. Müller-Armack's characterisation of the social market economy as an economic style did not find universal approval. Was Schmoller right, therefore, when he did not altogether follow his inclination towards the human sciences and shied away from a full application of this approach? Whatever the answer, he went no further than the concept of economic stages, which is easier to defend.

Dilthey says the following:

This creative activity, under the natural conditions which constantly provide material and stimulation for it, occurs individuals, communities, cultural systems and nations and becomes conscious of itself in the human studies.

In accordance with the structural system, every mental unit has its centre within itself. Like the individual, every cultural system, every community has its own focal point. In it, a conception of reality, valuation, and the attainment of goals are linked into a whole.

(Dilthey 1976, p. 197)

Perhaps at this point I should confess that there are few other intellectual endeavours which fascinate me as much as the one alluded to by Dilthey in this passage: the one concerned with the inner connections, analogies, or – if we wanted to use a mathematical expression – the isomorphism between different manifestations of the same culture within a society and a specific period of historical development. 'Style,' as the generic term for such connections, is undisputedly regarded as a reality in the fine arts, in music, and in literature, notwithstanding the fact that it is a reality of a peculiar nature, and that the delimitation of various styles from one another are the subject of never-ending debate. Thus, Dilthey only tries to give a conceptual definition of the actual practice of cultural historians when they not so much analyse but describe styles. It is not surprising, then, that there have been attempts to find connections between such endeavours at identifying styles and those of the Historical School in political economy seeking to distinguish between different stages of economic development. However, the generalisations that are necessary in order to make the use of the concept of a style meaningful are not easy to justify, especially not in the economic sphere.

We find that it was a long way from the early theories of stages (with their well-known precursors in Aristotle and Smith) to the emergence of the concept of an economic style. The theories of stages were better, or at least more ingeniously, conceived than they appeared to be in their later reception. But they were not as good as they could have been, partly because ethnology, cultural anthropology, and almost any kind of knowledge about the economic life of primitive cultures was lacking during the colonial age and was substituted with simplified materialist ideas. Thus, Malinowski, who introduced the decisive step forward in this area,

made a short and dismissive judgement on Bücher's understanding of primitive economic forms, despite the fact that Bücher stood out from the other German economists in this respect. It can be found at the beginning of his famous article on the Trobriand islanders, which Keynes published in the 'Historical Supplement' of the *Economic Journal* (Malinowski 1921).

Schmoller's representation of economic stages was certainly much weaker than that of Bücher, especially with regard to the earlier stages. He recognised the connection between the different aspects of a culture which Dilthey emphasised in such striking fashion, but he interpreted it as if it were a side-effect of the growth of power: 'We see that no people have become powerful and rich whose morality, law, religion, and constitution was at a low level.' The explanation of connections is mainly presented as a scientific programme for the future: 'This inner connection between the cultural areas within a society is certainly only little understood so far' (Schmoller 1923, II, p. 750).

Schmoller insisted on the concept of stages and resisted its expansion into a cultural-historical approach because he believed that the complexity of the connections could not (yet) be grasped scientifically. Thus, it was not the narrowness, but rather the width of his intellectual horizon which made him argue against premature, facile, or speculative syntheses to which the notion of style may easily give rise. His response to a *prima facie* suggestive typology assigned to Lamprecht (see Table 4.1, taken from Schmoller 1904, p. 663) was that such 'catchwords' for the characterisation of intellectual epochs 'in any case' did not explain their 'law, constitution, class relations, company forms'. Rather, 'they are designations which are mostly garnered from the life of the arts and the mind'. Schmoller acknowledged the significance of the questions Lamprecht asked but did not consider his answers viable for illuminating economic life.

In Schmoller's book, these words of caution, which should still be heeded today, are followed by a rather concise summary of his theory of economic stages. Directed against attempts at widening the concept of stages, he writes, 'In our *Grundriß* we did not want to venture into such elevated matters' (*ibid.*, p. 760). Instead, Schmoller based his theory of stages on the economic constitution as the fundamental term. It is typical for his vision that he usually associated an economic upturn with the expansion of national power, particularly in the

Table 4.1 Suggestive typology assigned to Lamprecht

<i>Epoch or Century</i>	<i>Spiritual Culture</i>	<i>Material Culture</i>
Primordial Time	Animism	Collectivist-occupying economy
Up to 10th century	Symbolism	Individualist-occupying economy
10th to 13th century	Typism	Barter economy on a collectivist basis
13th to 15th century	Conventionalism	Barter economy on an individualist basis
15th to 18th century	Individualism	Money economy with a collectivist approach to commerce
19th century	Subjectivism	Money economy on an individualist basis

geographical sense (*ibid.*, p. 771). Decadent tendencies are, in the first place, a consequence of a decline in morality.

Despite his reference to Dilthey in the course of the *Methodenstreit* [Dispute over Methods], Schmoller basically remained sceptical towards the generalisation that interested Dilthey. Schmoller pursued a realist programme of individual historical research which opened up ever wider fields of activity for his pupils but did not possess the same synthetic force as the roughly contemporary works in art history by Burckhardt and contributed little to the introduction of Dilthey's humanism into the sphere of economics. The scepticism towards the decisive role of culture but not towards such a role for law and morality fitted an author who wanted to be politically active within Wilhelminian Germany.

At the same time, the intellectual radicalism of Nietzsche denounced historicism for destroying the 'lifeworld.' Nietzsche doubted the integrity of historical research in the service of an 'unhistorical power' (Nietzsche 1997, p. 67). The emphasis on the political can also be interpreted as the open expression of a dubious will to power, and it is indeed questionable to what extent the human sciences themselves actually conformed to Dilthey's ideals in Schmoller's time. Dilthey's philosophy was the beautiful expression of an intellectual education that is anchored in real life, a possibility that was associated with the classical and romantic period and whose recreation was sometimes attempted at the beginning of the twentieth century. Schmoller, whose work falls in-between these two points in time, found it useful to associate his method with that of Dilthey, but he was able to do so only at the cost of exaggerating their common denominator, while at the same time reducing the breadth of Dilthey's philosophy, as well as that of his own scientific achievement. This operation did not really help explain the reality of economic research.

Of course, when viewed from the perspective of modern economic theory, both Schmoller and Dilthey are versions of one and the same German historicism. So powerful was this historicism at the time that Schmoller could refer to Dilthey as a well-known and recognised authority, which added an original interpretative approach within a well-established academic environment, while Menger and his emerging School of Marginal Utility could be treated as outsiders. This must be kept in mind when trying to understand Schmoller's work and his theory within its historical context. In my opinion, there is still no final verdict on his connection with Dilthey. It would be in line with Schmoller's way of thinking if, alongside pure theory, a historical orientation within economics could gain some ground again, and if categories of cultural history would be granted some limited applicability.

3. *The theory of economic stages*

Schmoller's achievements do not primarily consist in establishing an understanding of specific historical epochs, although he made important contributions to our knowledge of some of them, such as Mercantilism, for instance. Rather, they consist in the historical relativising which necessary precedes attempts at such

understanding. He emphasises that theoretical statements on the economic activity of individuals cannot be general but must depend on concrete historical conditions. The theoretical analysis of economic phenomena therefore presupposes an investigation of the developmental stage reached by the economy in question. This connection gives the theory of stages, these 'products belonging most properly to historicism' (Eisermann), such an importance that in the context of political economy, it is only this theory for which many people remember the Historical School. Hildebrand's and Bücher's theories of stages in economic development are particularly well known. But now we shall present a sketch of Schmoller's approach.⁵

As we have seen, Schmoller did not try to employ a full-blown idea of cultural systems as he thought he had found it in Dilthey (Schmoller 1883, p. 255) or any equivalent conception. He flatly rejected any claims to the ahistorical validity of theories. He accepted theoretical claims that are epoch-specific but remained cautious in making them concrete.

He considered the process of economic history as a sequence of stages in economic development which can be characterised in terms of common features of economic activity and economic constitution. In this, his investigations were limited to the historical development in the area of occidental states under which he also subsumed classical antiquity and the Roman-Germanic states after the Migration Period. These states represent a fundamental type of economic development which is juxtaposed to the theocratic-belligerent-despotic empires under which he counts in particular the Asian states but also, for instance, the Merovingian-Carolingian Empire. From these, the occidental states differ by their higher moral and economic culture, a more complex organisation of the state, as well as – unfortunately, this is also an element of Schmoller's economic analysis – 'by the fact that their members belong to the highly developed races' (Schmoller 1904, p. 668).

The first economic stage is the 'epoch of agrarian subsistence economy and tribal life'. This was a 'domestic economy which was initially only concerned with the provision of the family and associations of families – a concept which, of course, needs to be substantially expanded in the case of so-called economies. The advance of barter and monetary exchange in the tenth and eleventh centuries brought about the transition to the stage of the city economy. This form of economy, resting on complicated structures, achieved 'a corporative economy which operated independently and provided active guidance above the level of individual economic units' (Schmoller 1900, p. 293). In it, city markets played an important role for economic life.

Between the fourteenth and eighteenth centuries, we find the form of the territorial economy, which covered larger areas. It was characterised by the feudal order and the crucial role of the feudal lord. The princely household was at the centre of the economy. From the sixteenth century onwards, larger state-based national economies began to form. This stage of 'national economies', in which the first modern enterprises emerged, was characterised by Mercantilist economic policies. At the end of this development we find the stage of a global economy, 'the epoch of the new world states and of advancing global economic relations,

which began with the colonial acquisitions of European states, but took on larger proportions only within the past fifty years' (Schmoller 1904, p. 669).

We do not want to discuss the details of the criticism brought forward against Schmoller's division and differentiation of individual stages.⁶ In contrast to, for instance, Bücher, Schmoller did not want to present a theory of economic history. Rather, it speaks in Schmoller's favour that he was aware of the problems posed by such an undertaking. 'These are the last and most difficult questions of our science' (ibid., p. 465). Indeed, to the present day, there are no accepted and satisfactory answers in this area.

Schmoller considers the political organisation of a people as the most important moving factors in economic development:

Throughout all phases of economic development, the one or other political institution . . . assumes the leading and dominating role within the economic sphere. At one time it is the clan or tribe, at another the village or margravate, the landscape, the state, or even an alliance of states, which dominated economic life with their institutions.

(Schmoller 1898b, pp. 23)

Schmoller also believed that the true causes for the rise and decline of nations could be found in the organisational forms of politics and states. He saw a close connection between economic and political developments and observed 'cycles of a first political, then economic rise, followed by later decline' (Schmoller 1904, p. 676). Schmoller's interpretation of Mercantilism as a system which formed states, expounded in several works and illustrated in particular with the case of Prussia, gained an international influence which can still be felt today. In the *Grundriß*, it is reflected in the important and, of course, controversial chapter on trade policies, which is well worth reading.

There are aspects of the connection between, on one hand, political and spiritual and, on the other, economic factors as sketched by Schmoller, which are reminiscent of Marx, although Schmoller fundamentally criticised Marx's materialist theory of history.⁷ However, Schmoller conceded that 'the emphasis on chains of economic causal factors was justified in light of the earlier exaggerated idealist method' (ibid., p. 658), and he repeatedly points out such causal factors. Schmoller assigns an important role to social classes and class struggles. He is not as far removed from an understanding of history as a history of class struggles as one might expect.

4. Value and price theory

Of course, the *Grundriß* is not limited to an analysis of economic history. Schmoller allows for broad space being given to the theoretical investigation of economic variables, such as value, money, capital, credit, wages, profits, and income distribution. The following is meant to present the theoretical substance of Schmoller's treatise in exemplary fashion by concentrating on his theory of value and money.

Schmoller's investigation of value can be found in the second book of the *Grundriß*, following the chapters on transport, markets, and commerce; on economic competition; and on measures, weights, and coinage and money. He begins with remarks on moral value judgements and then proceeds to a discussion of economic value, distinguishing between exchange value and use value and stressing the superior importance of the latter with a reference to Austrian value theory. The labour theory of value in general and Marx in particular are vehemently criticised by Schmoller. He obviously prefers the subjective theory of value, although, as we have seen, at the beginning of the work he strongly relativises the importance of self-interest in his discussion of the motivating factors in human behaviour, and, moreover, in the course of evaluating market processes he introduces numerous modifications by distinguishing between good and bad customs in economic practice, as well as discussing the reasons from which they spring.

Schmoller sketches the determination of market value by supply and demand. By supply, he understands

the definite amount of a category of commodities, as known or estimated by those interested in it, which is seeking buyers in a specific market at a specific time, and is available for sale or expected to be available within the usual delivery time.

(Ibid., p. 109)

Demand 'is the desire of buyers, supported by the possession of money or credit, in the same market at the same time . . . to purchase these commodities' (ibid., p. 109).

In this model, the supply corresponds to an 'amount', pointing to a Marshallian perspective on the market, while the conceptual definition of demand as a 'desire' points to an analysis of the hypothetical preferences of individuals. This is not the only case in which Schmoller simultaneously draws on heterogeneous concepts.

In the 'special analysis' of demand that follows, Schmoller is mostly concerned with an analysis based on social history. He asserts that historically detailed research is necessary for an adequate formulation of a theory of demand and that

the problem of a scientific analysis and causal explanation of demand . . . [is] today not yet solvable. For this, it would be necessary to have a conspicuous overview of the kinds of economic consumption that have occurred in all peoples and classes across the times; one would need to know all physiological and psychological causes, to have a command of the whole history of human emotional development, of the development of customs, of culture and luxury . . . In many instances, the preliminary work for this is still lacking.

(Ibid., p. 129)

Given this orientation towards a social-historical approach, it might seem regrettable that Schmoller drew on the Neoclassical Theory of demand and not on the Classical one, which would probably have been more suitable for such an analysis.⁸

However, once we reach Schmoller's 'special analysis' of supply, there is little in the way of a subjective approach about it. Having begun the chapter on value with a heavy criticism of the definition of value based on production costs and emphasising the need for a reorientation of political economy towards use-value (ibid., pp. 106–8), he now changes the tone completely. There is talk of the failure of the 'assault' from the various schools of Neoclassicism against the 'law of production costs', and he mentions that in the end the Neoclassical authors 'admitted that, as a rule, production costs practically determine prices in the long run' (ibid., p. 149). Schmoller further highlights that production costs affect prices through the fact that supply is limited.

Schmoller discusses the movement of prices within markets under changing supply-demand constellations. Situations characterised by disequilibrium and adaptation processes are investigated, making reference to, among other factors, the mobility of labour and capital, the expectations of the economic subjects involved, and the role of surplus profit.

The conclusion which Schmoller draws from his analysis of supply and demand is reminiscent of Marshall's scissors analogy: 'We must be content with the realisation that in the long run the cost of production regulates the supply, and thus value, from one side, while it is determined by demand and its causes from the other' (ibid., p. 159).

We can summarise by saying that the section on value and prices in the *Grundriß* presents a value theory that remains thoroughly within the usual theoretical parameters. The historical illustrations change nothing about the fundamental character of the investigation. Rather, it is remarkable that in one place, Schmoller even argues in a strikingly unhistorical fashion: Even in the 'most primitive times and societies', the 'market value' is to be explained by supply and demand – a claim that contradicts historical and anthropological insights that some representatives of the Historical School already signed up to at the time.⁹

Schmoller does not hesitate in making value judgements in his deliberations. In general, he is positively disposed towards the price formation on the market with its oscillations caused by changes in supply and demand. He sees it as a 'necessary, all in all beneficial force that is indispensable for our economy' (ibid., p. 114). However, he at once mentions a limitation to this, adding that free competition may result in market values that are detrimental to the common good and lead to social injustices.

No coherent group of people, no market-based society, or any other kind, will ever be able to console itself over the fact of unfair prices, and over the unfair distribution of income that goes along with it, by saying that it is simply the result of the free and voluntary use of power by individuals.

(Ibid., p. 116)

It is therefore imperative, in the case of price formation as well, to take care that the primacy of morality is observed. In this context, Schmoller discusses older ideas about fair prices and illustrates how moral-legal and social-political

principles have been taken into account in the process of price formation in the past. His intention is to point out historical and contemporary examples of price control. The development of taxation systems is presented in a historical cross-section, followed by the tariffs of transport companies. Schmoller highlights the advantages of a public regulation of prices but can by no means be seen as a doctrinal defender of such regulation. 'Whether or not in some distant future, all price formation should be effected by a public taxation system, . . . is a question that cannot be answered today. I would like to answer with "no"' (ibid., p. 128).

5. *Schmoller's theory of money*

The essence of Schmoller's reflections on money consists of two elements, one of which is the historical development of money.¹⁰ He explains the emergence of money with the needs associated with barter and assigns an important role in its development to the state. His presentation of institutional changes is instructive and diverse and is not at all limited to the exchange function of money associated with the transition from barter to money economies. Schmoller looks at the rise of money economies, first of all, in connection with the emergence of capitalist economies. And he warns against the extreme consequences of this development:

. . . where money economies prevail, they produce more pronounced differences in property and wealth than ever existed before. And as 'money matters are where the fun stops', as personal considerations recede under conditions of a money economy, the toughness and ruthlessness of financial actors easily turns into a cancerous growth within society. They buy everything, public opinion, sometimes even governments and parliaments. Bribery, corruptibility, prostitution (of the mental as well as physical variety), the excesses of money matches, materialism free of any conscience, a cynical blasé attitude, a frivolous lack of affection, exploitative and unbending class rule, these are the traits of extreme money economies.

(Ibid., p. 99)

As a conservative who was sceptical of capitalism, Schmoller considered it his political and moral aim to prevent such a development and to promote a stronger consideration of ethical principles in economic life.

Schmoller's theoretical analysis of monetary value can be found in an investigation that is inserted into the chapter on the theory of value, in the context of the theory of supply and demand.¹¹ 'Any change in monetary value will originate from a change in the supply of or demand for money or the precious metal' (ibid., p. 159). Schmoller here deviates from the method usually employed by English Neoclassical economists around the turn of the century of carrying out the analysis of money in the context of considering aggregate values. Schmoller's approach is essentially a microeconomic one.

Schmoller analyses the determining factors for the supply and demand of money, which he mainly takes to be gold and silver. The supply of money is primarily

determined by long-term trends in the production of gold and silver. On the demand side, Schmoller is mainly concerned with the monetary demand for precious metal, which depends on institutional factors such as the legal regulations on coinage and currencies, payment practices, and the distribution of paper money.

Thus, what is crucial are the magnitude and volume of value transactions mediated by money, the velocity of monetary circulation (which increases with publicly guaranteed security, yet even in today's cultured states may oscillate significantly from year to year, according to payment needs and the economic cycle), but also the volume and velocity of circulation of credit as a substitute for money, such as bank notes, paper money, bills of exchange, cheque and giro transactions.

(*Ibid.*, p. 162)

We can see that Schmoller is aware that the demand for money can be influenced by very different factors, which partly influence the velocity of circulation, partly the volume of substitutes for precious metal, and partly the demand for precious metals themselves. And the desire for precious metal is not just based on its monetary function. The supply of precious metal always depends on the production costs and the technological progress in the running of gold and silver mines (*ibid.*, p. 161). When Schmoller says, 'Where prices in general rise or fall, we are always led to explain this with the value of money' (*ibid.*, p. 163), this value of money could thus be seen as determined by the cost of production. However, Schmoller does not take sides in the dispute between those who conclude from the quantity equation mainly that the level of prices is usually determined by volume of money, and those who claim that, assuming a certain price level as given, the volume of money and/or its velocity of circulation must adapt to the transaction volume. What appears to be clear is that he starts out from the production costs, which must, in the long term, determine the value of money under the conditions of a gold-backed currency, but that he also takes into account many factors on the demand side, which affect the value of money and the price level in the short term through scarcity, and in the long-term through changes in the supply conditions (production costs). He forcefully warns against the dangers of inflation, which can be caused, for instance, by debasement.

Political economists in the historicist tradition have often been accused of underestimating the significance of the volume of money for the price level and to have exerted a fatal influence on a whole generation of German political economists and politicians as a consequence. The devastating effects of the financing of World War I, it is alleged, were therefore left undetected for a long time. This accusation may be justified with respect to, for instance, Knapp's 'state theory of money'. However, as far as Schmoller is concerned, it certainly is not.

In this context, we should also mention Schmoller's rejection of paper currencies, which is motivated by his concern for the stability of monetary value. Although he concedes that 'a substantial part of the damage caused by paper currencies is avoided' (*ibid.*, p. 173) if economic policies are implemented which achieve long-term stability of the exchange rate of a paper currency in relation to

foreign hard currencies, at the same time he emphasises that in practice this will only very rarely be the case. Obviously, Schmoller was guided by a deep suspicion towards the monetary policies of governments.

Schmoller's worries about the stability of monetary value are caused in particular by the distributive effects of inflation. He highlights the fact that as a rule, the entrepreneurs profit from inflation:

With a sly smile, the economist in London between 1860 and 1875 spoke of the 'democratic power' of monetary devaluation, i.e. of the rising power of the entrepreneurial bourgeoisie compared to the state, the Church, the aristocracy, rentiers, and civil servants.

(Ibid., p. 167)

Schmoller, a traditionalist who was in favour of a strong state and civil service and of an alliance between the Prussian-German monarchy and the working class (Schmoller 1918, p. 648), wanted to avoid political consequences of this nature.

Schmoller also did not make up his mind regarding the extent to which interest is a monetary phenomenon or a phenomenon of the real economy. He was fully aware of Böhm-Bawerk's theory of the natural rate of interest, and in his summary he calls it a 'perfectly correct design as such'. But other approaches are also entitled to a certain validity, even the exploitation theory, to the extent that it criticises extortionate deviations from 'fair' interest. What constitutes fair interest is not explained. Similar to Aristotle, Schmoller assumes a given sensitivity for morality in economic matters. General attitude and the political consequences to be drawn from it are more important to him than quantitative explanations of what constitutes justice. The classical fear of falling rates of profit he opposes with the proposition: 'The continuous decrease in the rate of profit is one of the greatest social advancements' (Schmoller 1904, p. 211). This is so because low interest rates can be the point of departure for a permanent economic upturn. In instances such as this, a valid macroeconomic instinct occasionally prevails in Schmoller over the doctrines of the contemporary economic schools.

6. *The limits of Schmoller's theoretical achievements*

Schmoller's theory of value and money shows that his theoretical analysis of economic problems does not exactly shine with brilliance but actually offers more substance than one might expect on the basis of the image he enjoys within academic circles. His skill does not consist in theoretical construction, not even in the selection of theories, but in their combination and striking application to rich historical material. Schmoller's theoretical statements therefore differ less from those made by the schools of political economy that he opposed than we might suspect. Schmoller enriched theoretical analyses with historical illustration and did this to an extent far exceeding what others – such as Roscher or Knies – had achieved. In that sense, Schmoller certainly advanced the historical perspective a good deal. But he did not succeed in turning the detailed historical research into the new material theory he was striving for. The

empirical material is not put in the service of a new line of thought, the investigated experience is not condensed into a doctrine. The application of the enormous wealth of empirical material serves the purpose of explicating the old theory.

(Spiethoff 1938, p. 412)

Spiethoff thus holds that Schmoller gave up 'the advantages of the pure theory of the ideal type . . . without therefore gaining the ones of a material theory' (ibid., p. 413). Salin goes even further in his opinion that 'a form of research in economic history which lacked theory, or to be more precise: theoretical questions and fixed concepts, . . . [could] never provide the ingredients for a material historical theory' (Salin 1967, p. 139).

Kaufhold (1988, p. 246) claims that German political economy never found a wider international echo than in Schmoller's times. However, the incapacity to formulate a theoretical alternative to Neoclassicism was probably the main reason for the surprisingly rapid decline of the Historical School after Schmoller's death.

The Historical School did not just suffer from theoretical deficits, though. Within a framework of theoretical reasoning that tries to take national, geographic, and historical specificities into account in the manner attempted by Schmoller, clear theoretical statements and recommendations for economic policies are difficult to formulate. This can be demonstrated in exemplary fashion by looking at Schmoller's contribution to the debate over protectionism.

Schmoller criticised both the theory of free trade and that of protectionism, and his efforts aimed at finding a pragmatic middle ground. Protective tariffs and free trade are meant to be 'no longer questions of principle . . . but only changing means in the trade policies of states' (Schmoller 1904, p. 647).¹² The selective application of the instruments of trade policy is meant to depend on the specific conditions of the states' economies. However, the reader is not shown how this is meant to work in practice. Schmoller offers no more than very general remarks and avoids theoretical statements. Salin even says that Schmoller, although in the end he made the Verein für Socialpolitik [Association for Social Policy] join the side of those in favour of protective tariffs, 'did not have a theoretical, but only a personal and honourable reason, which is devastating, though, for science: that Bismarck will have been right this time as well, as he had always been right before . . .' (Salin 1967, p. 143). However, Kaufhold has defended Schmoller with convincing arguments against this charge, and in the lecture in question identified a clear separation between the substantial and scientific line of argument and a personal remark that is explicitly marked as such (Kaufhold 1988, p. 234).

Quite apart from that, no one will be inclined to underestimate Schmoller regarding his policy recommendations. One need only think of the role he played in Bismarck's social policies. Even where he wavered in theoretical questions, he trusted in his power of judgement, which was guided by historical knowledge and political experience. Schmoller's work should be judged according to its author's own view of it, who modestly considered it to be the product of a transitional phase. Despite all criticism of detail, it should not be overlooked that the general intention of the Historical School – that of transforming political economy into a

proper social science in which historical, cultural, and institutional aspects all find their place – is justified and deserves to receive renewed attention.

In between Historical School and modern Institutionalism: J. R. Commons's Institutionalism

American Institutionalism is one of the major and still influential movements within political economy. Although Veblen's *The Theory of the Leisure Class* (Veblen 1953 [1899, 1912]) is usually considered to be the main work belonging to this movement, Commons is hardly less important than Veblen. In fact, in light of the renewed interest in the connection between political economy and legal studies and those theoretical developments summarised under the heading of a New Institutionalism, his magnum opus, *Legal Foundations of Capitalism* (Commons 1924), represents a more interesting challenge for recent research.¹³ For a reader who is familiar with the Historical School and has an idea of the New Institutionalism, the old Institutionalism may appear like an unknown territory in-between the two. This middle position is the subject of controversial discussions in some of the literature.

The more recent Institutionalism makes decisive use of modern theoretical concepts which emerged from the Neoclassical tradition. In its analysis, it assumes a rational agent whose decisions are, however, partly determined by institutionally embedded factors. In that sense, the analyses refer to specific situations. And although a maximising behaviour in the narrower sense is not necessarily presupposed, the intent is nevertheless to give causally sufficient explanations without resorting to any irrational factors. This is meant to capture, for instance, the main aspects of Schumpeter's sociology of the entrepreneur (Langlois 1986b, p. 252). Economic phenomena are not interpreted as intentional results of goal-oriented economic behaviour. They are not consciously created by human individuals but are the unintentional result of human actions, in the same way in which Adam Smith's 'invisible hand' guides market processes. This pattern of thought is meant not only to serve the purpose of understanding the changes in quantitative economic values, such as prices, incomes, and so forth, but also to explain the role, even the emergence, of institutions, just as Adam Smith interpreted the formation of the market society as the result of an unintended development which began within feudal society. Evolutionary – and, in particular, selective – processes therefore play an important part in the more recent Institutionalism.

The directions which the older Institutionalism took are less easy to circumscribe. As given data, institutions had also found their place in Neoclassicism – in particular, in its Marshallian form. For Veblen, who became famous (or infamous) as an Institutionalism, institutions were anchored in habits of thought, and he therefore made it a task of economy to study the development of habits and customs. Mitchell, by contrast, turned more towards the empirical investigation of economic changes which can be measured in quantitative terms, while Commons looked at the framework of legal rules for economic activity, in juxtaposition to the interplay between private and collective action. All three writers

wanted to distinguish themselves from Neoclassical Theory by pointing out the complexity of the motivations for action and at the same time the limitations in the knowledge of economic actors. The emphasis on the uncertainty which regularly characterises economic decision-making can be seen as one aspect of this criticism. In this respect, it touches on the approach of Frank Knight who, to that extent, can be subsumed under the Institutional tradition.¹⁴

Institutionalism and the Historical School share an emphasis on the historical transformations of human rationality, as it was systematically developed by Max Weber:

the situation of today shapes the institutions of tomorrow through a selective, coercive process, by acting upon men's habitual view of things, and so altering or fortifying a point of view or a mental attitude handed down from the past.
(Veblen 1899, quoted in Hodgson 1991, p. 208)

In general, habits do not become the object of reflection and may remain unconscious. Thus, behaviour based on habitual routines may limit the production capacities of a company. The employees of the company acquire this form of behaviour within the context of their work and pass it on to others. The selection process which leads to the behaviour in question is culturally conditioned and can therefore not be reduced to a natural process in analogy to Darwinian selection.

The achievement of the older Institutionalism was not the development of an alternative theory based on more complex motivations for economic behaviour – despite some progress, this remained a project. However, neither did Institutionalism get stuck at the level of discerning descriptions of the social aspects of certain economic systems, such as Veblen's account of the culture of a 'leisure class'. Commons set himself the goal of establishing a theory of value based on the human will. By this, he did not mean a scale of preferences or a decision theory and even less a utility-maximising calculus. Where decisions are taken on the basis of given preferences and under conditions of certainty or calculable risk, a decision is causally determined in unambiguous fashion, and those elements of historical influence in which Commons was interested in his analysis of will-formation, such as customs, power, and the law, are absent. For Commons, the determining factors in will-formation develop according to an historical logic, which he compares to technological evolution. The development of the steam engine, for instance, took place in mutual interaction with all kinds of changes in demand that were due to the necessities of production and the emergence of novel needs. Thus, steam engines were first constructed for the purpose of draining mines, then for powering working machines, and finally for ships and locomotives, while a different sequence would have resulted under a different development of demand.

If the final point of a path depends on its starting point and further course, and thus not all paths lead to the same end point as in the case of long-term equilibria, one speaks of the 'path dependency' of a development. When applied in social contexts, the concept is opposed to ideas of natural law whose representatives

believe they can identify goals that are independent of history. Commons never tires of illustrating the phenomenon of historicity and drawing on it for its explanatory power. In particular, he looks at the development of the legal framework which determined the form of transactions – for instance, in the differentiation of credit systems or in the regulation of labour disputes. And often, history might also have taken a different course:

The desirable customs were selected gradually by courts, the undesirable customs were progressively eliminated as bad practices, and out of the whole came the existing economic process, a going concern, symbolized by a flux of prices, and operating to build up an artificial mechanism of rules of conduct, creating incorporeal and intangible property quite different from the unguided processes of nature.

Thus a volitional or economic theory starts with the *purpose* for which the artificial mechanism in question was designed, fashioned and remodeled, and inquiries, first, whether that purpose is useful or useless, . . . right or wrong. Then it inquires whether the artificial mechanism in question accomplishes that purpose in an efficient or economical way, and if not, what is the limiting factor. . . . Then it adopts or changes the shop rules, working rules, common law or statute law that regulate the actions and transactions of participants. It is a theory . . . of an artificial and not a natural mechanism. (Commons 1924, p. 377)

Thus, it is also with all phenomena of political economy. They are the present outcome of rights of property and powers of government which have been fashioned and refashioned in the past by courts, legislatures and ex[e]cutives through control of human behavior by means of working rules, directed towards purposes deemed useful or just by the law-givers and law interpreters.

(*Ibid.*, p. 378)

This approach is obviously close to modern Institutionalism, as far as the genesis of legal institutions follows an economic logic, and therefore can be understood from the perspective of efficiency. Thus, under certain conditions, forms of communication that do not conform to markets can also be efficient. A modern example would be a company which internally operates according to hierarchical rules or, if we turn to history, a village cooperative, if the community is small enough and the disadvantages of the need for mutual control are counterbalanced by savings in transaction costs elsewhere.

Commons, however, asks the question of the *purpose* which the legislators, e.g. the king's judges or the elders who determine certain customs, associate with their stipulations. The understanding of the purpose of actions is historically shaped and is therefore able to establish conditions for economic behaviour – for instance, in the context of certain political constellations – that contradict principles of efficiency, such as the minimisation of costs or the best possible provision of supplies on the basis of certain distributive rules. There is, however, no measure of welfare in Commons that would result from pure theory and could be used as a criterion

for deciding on which policy interventions to make. Wherever regulations drastically obstructed the economic process, they were changed. Commons's vision of the historical process is nevertheless not arbitrary because, on one hand, the ideal of a competitive economy free of all intervention cannot be found in him, except when it is criticised in the course of discussing other authors, and on the other hand, we are able to understand the purpose of the newly created institutions.

In Commons, the vision of an experimental development of the conditions for economic behaviour is at the same time the model for the development of the science of economic behaviour.¹⁵ His understanding of knowledge formation corresponds to the pragmatic philosophy of Peirce: the law is not a superstructure above technological and economic development but grows alongside it; it is expanded or cut back as if it were itself a technology.

Of the triumvirate of the great American Institutionalists – Veblen, Commons, and Mitchell – Commons is seen as a lone figure. Fifty years ago, Kenneth Boulding already considered him to be the most important and influential of the three. And yet, he remarked, every year new books about Veblen emerge, while Mitchell inspires the writing of commemorative volumes. But this difference in attention, he predicted, would be reversed in future times. These times, it appears, are now upon us.¹⁶

Commons was born in 1862 in Ohio and studied at the Congregationalist Oberlin College with James Monroe and at Johns Hopkins University with Richard T. Ely, a pupil of Knies. At the beginning, he was close to the Austrian School. He wrote a nice, illustrated autobiography which describes the gradual development of an unusually conscientious, religious, but also scientifically interested young man, leading him to economic theory and to becoming a scholar of international standing. From 1904, he taught in Wisconsin where he soon also became politically active in an advisory function related to questions of taxation and labour law, which formed the experiential background to his *Legal Foundations*. Commons intuitively leaned towards the labour movement, and he found it hard to endure what he considered the vanity of the upper class. However, in his action he was, first and foremost, an American democrat and reformer. A few lines from the end of his autobiography may illustrate his commitments:

My twenty-five years' experience, from the Pittsburgh Survey of 1907 to the unemployment insurance law of 1932 in Wisconsin, with the development of my ideas on administration and collective bargaining, I wrote up finally in 1933 for my *Institutional Economics*. At my seventieth anniversary, with an audience of some two hundred colleagues, students, citizens, and officials of the state, the most satisfying speech, to me, was that of the business agent of the Chicago Clothing Workers who said, 'You are responsible for seven million dollars, one million a year, paid out as unemployment benefits to the members of my union'.

(Commons 1963 [1934], pp. 200–1)

However, rather than tracing the biographical roots of Commons's theory further, let us turn to the connection between the Historical School and Institutionalism.

Schumpeter went as far as to call Schmoller the 'father of Institutionalism'.¹⁷ But the family resemblance between the work of Commons and that of the School of Social Law, with K. Diehl, R. Stammler, and R. Stolzmann as its main representatives, is also apparent.¹⁸

In 1927, at a time when Commons's scientific productivity was at its peak and the youngest of the Historical School – in particular, Sombart – still exerted some influence in Germany, E. Flügge saw the Historical School and Institutionalism as pursuing parallel programmes.¹⁹ Veblen's influence appeared even greater to her than that of Sombart, because Veblen's predecessors had been less important, and because there had been no *Methodenstreit* (Dispute over Methods) in America (Flügge 1927). In 1955, J. Dorfman investigated the role played by the Historical School as a precursor to American economic thought (Dorfman 1955). According to him, the Historical School was the subject of widespread controversies in the American press during the 1870s. To some, it appeared socialist; to others, as a group of thinkers who had advanced economic policies based on liberal principles and who were responsible for protective labour laws and social policies that had kept the poor from starving. The successes of German policies promoting industrialisation were acknowledged, and empirical contributions – in particular, those by the statistician Engel – were admired. Then, in the course of the 1880s, the number of American students in Germany increased. Richard T. Ely was impressed by the German science of finance and administration and recognised that it would soon be necessary to follow the example of German social legislation. In this context, he persuaded his pupil J. R. Commons to write his famous *History of Labour Law* in the United States. Adams was looking for a labour legislation that would be suitable to the needs of the United States, and Seligman discussed the methodological aims of the Historical School in connection with an attempt to leave behind the opposition between induction and deduction. When the American Economic Association was founded in 1885, its principles included a commitment to those of the Historical School, insofar as they emphasised the role of the state in promoting economic progress, juxtaposed the task of historical and statistical studies with the 'speculative' work of earlier economists, and demanded the formulation of social policies, while otherwise stressing the political neutrality of the science of economics.

Prior to Dorfman collecting these facts, Antonio Montaner, in 1948, had claimed that little was known about the relationship of Institutionalism to the Historical School (Montaner 1948, p. 115). Institutions, as is well known, are discussed in Schmoller's *Grundriß* as an aspect of the organisation of communal life. Property, serfdom, markets, coinage, freedom of trade, and such like, are all institutions which Schmoller interprets as the sum of habits and moral rules, of customs and the law, with the 'bodies' representing the institutions' personal side: 'marriage is the institution, the family its body' (Schmoller 1978 [1923, 1900], my transl.). The origin of the theory of social organisation for Schmoller is Schäffle. Mercantilism considered institutions to be the product of arrangements made by the state; liberalism tried to reduce them to a system of contracts that are freely entered into. In Schmoller, they are the objects of an evolving science.

Schmoller's evolutionism had its equivalent in American Institutionalism, and it was accepted as a model to be followed by Veblen. But there are also clear differences: Montaner reads American Institutionalism as an expression of faith in the possibility of rationally designed social and economic orders but sees in Schmoller 'a deep faith in historical life' (Montaner 1948, p. 127, my transl.). Schmoller's socio-economic conception, he says, circles around the ethical problem of justice, while the reflections of Institutionalism circle around the idea of economic expediency. Within Institutionalism, the law serves a pragmatic function. Schmoller, by contrast, insisted on social policy raising demands that can be derived from moral postulates, which, in turn, can be supported by science.

And yet Montaner's evaluation can also be turned around. Schmoller was without a doubt more of a historical relativist than Commons and thus forced to adopt his own idiosyncratic pragmatism. While Schmoller felt challenged by the differing valuations of earlier periods and from other parts of the world, Commons remained deeply infused with the fundamental principles of American society – in particular, the principle of equality (Voegelin 1928, p. 236) – and these principles set the limits, even the goals, of his social experiments. The Historical School and American Institutionalism clearly depended on each other, in some respects, and it would thus not be right to talk about two entirely separate formulations of the same circle of questions. But despite the temporal sequence and the evidence for personal connections and influence, they both developed with such characteristic traits of their own that we must also acknowledge that their proposed solutions to similar problems, as well as the manner in which these solutions were arrived at, differ in essential aspects.

The background to Commons's evolutionary theory of value was, on one hand, his role as an advisor on economic policies and the reforms he suggested in Wisconsin and, on the other, the history of Anglo-Saxon jurisdiction. His search for a justification of what might constitute economic justice, just prices, or, as he put it, 'reasonable value' led him to an investigation of the legal foundations of capitalism itself.

The nature of capitalism is '... production for the use of others and acquisition for the use of self' (Commons 1924, p. 21).

The following interpretation is based on W. C. Mitchell (1988). In this reading, the foundations of capitalism were laid by judges who decided on the property rights regarding production factors and sales and purchases. This jurisdiction is still present today, not only in the few cases that actually end up in court, but also as the background to all transactions.

If property rights are not naturally given, they must have undergone historical changes. Commons begins with the observation that originally the king did not distinguish between property and domination. For William the Conqueror, it can be said: 'Property and sovereignty were one, since both were but dominion over things and persons' (*ibid.*, p. 214).

And the same applied to his vassals and all others who were not serfs: 'Property was lordship by virtue of possession. It was a personal relation of command and obedience' (*ibid.*, p. 215).

Property entailed a power of disposition over objects and people because the land and serfs belonged together.

The emergence of a plurality of institutions was required before the ownership of land and the disposition over people could be separated. One of them was the increasing monetarisation of the economy, which enabled the payment of rent in the form of money. This made agricultural yields measurable and, in combination with interest rates, allowed the determination of a price for land by way of capitalisation.

Commons was less interested in the sometimes revolutionary transformations that enabled the peasants to turn socage and payment in kind into cash payments. This process had the concomitant growth of markets as one of its pre-conditions, and it is still controversially discussed by economic historians today.²⁰ But Commons, rather, was fascinated by the legal system which was associated with this process and which had to allow the peasants to confront the landowner and lord as independent legal persons, although originally the former possessed the exclusive right of jurisdiction over his serfs. Even before the peasants became independent legal persons, the freemen had to maintain their legal entitlements against the king. This is one of the meanings of the Magna Carta (Commons 1924, pp. 216f.). Although the barons pushed it through, the royal prerogative grew. However, at the same time, common law emerged as the royal courts increasingly replaced those of the feudal lords. Commons saw the need to distinguish between the rent of the king – taxation – and the rent of the landowner as an important motivation for this differentiation.

Thus the right of private property in land emerged from the struggle of 450 years between the sovereign as landlord and his vassals as tenants, over the rental value of land. . . . The duty to pay definite taxes in cash, determined collectively by monarch and the representatives of the taxpayers, was substituted for the indefinite duty to pay rent in commodities and services, determined individually by the chief landlord. As long as the King could arbitrarily fix rents, whether in services or money, he was truly the owner as well as the sovereign. When the rents were fixed collectively in cash, he became only the sovereign and his tenants became the owners.

(Ibid., p. 220)

Only with this development could land become an asset to be bought and sold like other pieces of property. In a parallel development, the peasants gradually began to claim their rights against the landowners and finally turned into tenant farmers. For the cities, for the crafts and guilds, it is equally the case that royal law only gradually replaced local jurisdiction and special rights and thus prepared the ground for the formulation of the conditions under which a fair economic competition was able to develop and a contract law could be formed.

Commons further examined the process in which the commercial practices of merchants were legally secured. Only after a transitional period were the courts prepared to recognise bills of exchange and other credit instruments.²¹ Finally, property law could also be extended to the sale of claims to future profits.

This interpretation of the historical development is reminiscent of Polanyi's account, according to which free circulation developed in commodity markets before it developed in factor markets (Polanyi 1957 [1944]). Legal ties, such as systems for poor relief which limited the mobility of labour and limitations placed on the availability of land by inheritance law, continued to exist into the period of the Industrial Revolution. Polanyi considered the emergence of classical liberalism and its programme of liberating the markets, especially factor markets, as the preliminary endpoint of this process. Against this view, Commons would have held that a form of capitalism that is not permeated by legal regulations is altogether inconceivable.

Property rights and civil liberties must be put in relation to each other and at the same time separated from each other. Commons presents several examples, in order to demonstrate the longevity of the prevalence of the idea of property rights as tied to objects, as in the case of a slaughterhouse which was furnished with a monopoly by the state administration in New Orleans. The existing butcher shops filed a case for the right to exercise their profession, which had been taken away from them by this monopoly, and which they considered their property. However, they lost their case at the highest court because the majority at the court still held on to the idea that objects which constitute property must be of a material nature (Commons 1924, pp. 12f.).

The book's most interesting passages probably concern the measure taken to protect labourers. In them, Commons speaks from his many years of experience about problems such as the law which limited the hours of work for women in the clothing industry. This law had been rejected in 1895 on the basis that 'the legislature does not have the right to deprive a class of people of a privilege which is granted to other people under the same conditions'.²² Behind this issue about work contracts lies a general problem. Speaking of labourers, Commons writes,

What he sells when he sells his labor is his *willingness* to use his faculties according to a purpose that has been pointed out to him. He sells his promise to obey commands. He sells his goodwill. But even this promise has no exchange value. When the business man sells his goodwill, he promises to stay away and not compete. His goodwill is a separable asset attached to his going business and transferred to another. Likewise, when the labourer sells his physical *product* he sells his promise to stay away and not exercise his will upon the product. But when he sells his labor he sells his promise to stay on the job with it.

(Commons 1924, p. 284)

Modern law, however, does not allow the labourer to enter into an unconditional commitment, because this would amount to selling oneself into slavery. Therefore, the labourer can also not be bound without temporal limitations, and a work contract requires periodic renewal.

On this legally uncertain ground, trade unions and labour organisation become active by influencing the conditions of individual contracts, agreeing to collective contracts, and trying to steer the legislation in a direction that is favourable

to their interests. To a certain extent, the situation has no doubt changed to the advantage of the labourers since the times of Commons. He saw them in a position of disadvantage but, on the basis of a historical parallel, with the prospect of improvement:

History repeats itself, and the Supreme Court takes over the protection of the liberty and power of business, just as the prerogative courts protected the privileges of the monarch and his party. . . . The reasons and precedents are on the side of business, and the liberty and power demanded by labor is as contrary to precedent as the liberty and power demanded by business was contrary to the precedents of feudalism or the King's prerogative or the special privileges of guilds or the common law of agricultural England. . . . Apparently, a 'new equity' is needed – an equity that will protect the job as the older equity protected the business.

(Ibid, p. 307)

At present, however, trade unions appear to be more interested in higher wages than in safeguarding jobs. But the importance of Commons does not lie in his prognoses about the possible development of interests; rather, it lies in his attempt at using his 'volitional theory of value' in order to demonstrate how the economic evaluation of the balancing of interests takes place under historically shifting conditions, but for each period under legal conditions which apply to the majority of transactions. For this purpose, he developed a peculiar philosophy of the will, according to which chosen actions cannot be explained in a quasi-mechanical fashion, in the way that the consumer decision can be derived from given preferences, prices, and incomes in Neoclassical theory. Instead, the will is placed outside any determination by natural laws. The will is characterised as a force that can set limits to its own executions.

The 'consciousness' of the will which limits itself, is a . . . meaningful order of life. At the level of the physiological base, i.e. in the world of natural laws, actions may appear as the neutral fulfilment of a law, but at the level of the meaningful order, they also have the possibility to differ from that.

(Voegelin 1928, pp. 222f., my transl.)

Scarcity thus must be seen in relation to the will of those concerned, which is determined by concrete situations, and 'property is not an object in the external world, but the expectation of my freedom to act in relation to the external world' (ibid., p. 224, my transl.). Property, therefore, is the freedom to carry out certain actions, such as the right to pursue a particular economic interest.

In the case of opposed wills, the political power must decide. We are guided by a theory of value:

Not, of course, by that hedonistic theory of pleasure and pain of Bentham and the economists, in which each pleasure or pain and each person counts as one, but by a theory of personification in which individuals and classes

of individuals count according to what is felt to be their relative importance for public purposes. . . . [I]nstead of an 'organic' theory of the state based on duty, or a 'contract' theory of the state based on liberty, we reach what may be distinguished as an economic theory of going concerns based on the *authoritative* [my emphasis, B. S.] proportioning of inducements in a world of limited resources.

(Commons 1924, p. 360)

The subjects of this theory are not only individual people as bearers of a will, but also companies, associations, and whatever else counts as a 'going concern' in the sense of Commons. Their behaviour is guided by a will that must subordinate itself to habits and customs. These determine which costs must be met and when demands must be considered excessive. In between the two, we find the 'reasonable value'.

Commons started out with an attempt at connecting the traditional Austrian theory of Value with legal concepts. He thought that Böhm-Bawerk, who was a jurist and remained interested in legal questions, already tried to do this but gave up after noticing the incompatibility of pure theory and legal order. Commons became an Institutionalist of the old type by severing the connection in his own way, and the separation he performed was so radical that it was possible to claim that he was even less of a theorist than Veblen. He was called a creator of concepts who found new ways of interpreting economic phenomena but not theoretical constructions that serve the purpose of prediction (Zingler 1974).

Within the context of the new Institutionalism, the question arises as to whether the territory opened up by Veblen and Commons may after all be worked on with the expanded means of modern theory as it grew out of Neoclassicism. Copeland, in an article written roughly halfway between the beginnings of American Institutionalism and today, stated that a considerable number of the theses held by Institutionalism by then had found a place in the theory of the day, such as the problem of underemployment or forms of imperfect competition. Was that a victory of the Institutionalists? 'But really they succeeded in selling to the model analysts – or to a good many of them – only those planks in the institutionalist platform that could most readily be translated into the language of model analysis . . .' (Copeland 1951, p. 59).

It will be up to the reader to decide whether this judgement still holds.

Johan Åkerman's *The Problem of a Socio-Economic Synthesis* [*Das Problem der sozialökonomischen Synthese*]

If we want to understand Åkerman, we have to imagine the times in which he lived. For economists, the 1930s are considered 'the years of high theory', because the development of the theory of imperfect competition, of input-output analysis, and the beginnings of growth theory were all developed in this decade.²³ Several major debates on the theory of capital, on monetary explanations of the economic cycle, and on the foundations of econometrics took place. Keynes wrote his *General Theory* and Schumpeter his *Business Cycles*. None of

these transformations would have been possible without leaving behind the general equilibrium theory of the Walrasian kind. And even the latter was further developed through careful mathematical treatment, stricter existence proofs, and stability analyses.

No matter how much their thinking was determined by the demand for logical rigour, the theorists nevertheless believed that they were getting closer to reality. For instance, there were attempts at adapting the theory to the changing forms of the market. The desired *adaequatio intellectus ad rem* also seemed to require a transformation of *homo oeconomicus*. The Swedish School made the formation and the effects of expectations topical. Keynes's explanation of the consumption function on the basis of a psychological law, his emphasis on the fickle nature of the 'animal spirits' of entrepreneurs when it comes to investments, his linking up of the liquidity preferences of asset owners with feared or hoped for changes in the interest rate, and his radical distinction between the concepts of 'uncertainty' and 'risk' amounted to a break with previous assumptions about rational behaviour. In the way he demonstrated and justified his assumptions regarding the economic subject, Keynes sought a middle way between openly presenting his unconventional epistemological position in an abstract form and a vivid, pictorial description of economic life. To many of his contemporaries who did not recognise Keynes as an epistemologist, his postulates on consumption theory appeared to be nothing but *ad hoc* constructions and his views on the functioning of stock exchanges as frivolous. To these individuals, the connections he made between elements of the traditional theory, such as the marginal productivity theory of real wages, and new concepts, such as the concept of effective demand, could only appear arbitrary as well. However, today we know not only that the distinctions he drew were based on a logic derived from his investigations into the theory of probability, but also that they were connected to his engagement with the Cambridge philosophers Moore, Russell, and Wittgenstein. This engagement is slowly brought to light by studies into the development of his theory. And we are today also able to acknowledge his cultural modernity, as expressed by his contacts with the Bloomsbury group (Mini 1991).

Despite many reasons for relativising details of his work, Keynes remains the key figure in the theoretical history of the period. His indirect influence far exceeds Keynesian economic policies in the narrower sense or the contributions to the design of national accounts which he inspired. While Schumpeter prepared the way for the concepts of an evolutionary economics, Keynes cleared the ground for taking into account the limits of rationality in the formation of theories. Keynes's influence in modern research goes far beyond his direct influence in Post- and Neo-Keynesianism. However, at the same time we witness attempts – in particular, by the Chicago School – to explain human behaviour in ever-remoter regions outside the traditional domain of economic activity on the basis of the rational optimisation of subjects, attempts which even reach into ethnology (Posner 1988) or addictive behaviour (Becker, Grossmann, and Murphy 1991). This, today, marks the tension between a sociological and Institutionalist approach, on one hand, and analytic calculation, on the other. This tension plays

the central role in Åkerman's work. His merits derive not from the fact that he would have introduced new assumptions about rationality into theory, but rather from his clarifying the methodological opposition between equilibrium analysis and history.

But the 1930s, during which Åkerman's book was written, were also years of new experiences with, and reflection on, economic systems in comparison with one another. What was one to make of the Soviet Union, which, just at a time of economic crisis, surprisingly began to accelerate the process of industrialisation at the expense of enormous sacrifices? What of Italian Fascism and National Socialism, both of which behaved arrogantly but were not without their economic successes, finding imitators in some European countries and in all of them at least some admirers? Finally, there was the social democratic challenge to liberalism, which was associated with high hopes. Its contours began to take shape in England and Sweden, and Roosevelt pursued it in his own way with the New Deal in the United States.

Within the German-speaking areas, the Historical School had formed important concepts for the comparison of economic systems. Here, it was taken for granted that the forms of the economy and the state are subject to change. Eucken's *Grundlagen*, published in 1940, tried to make possible an approximation of alternative economic systems, either of the present or the past, through a combination of predetermined theoretical elements and, accordingly, could be understood as the completion, as well as the overcoming, of the Historical School – completion because the organisational principles (order) of different economic systems probably had never before been contrasted so sharply, and overcoming because the descriptive elements were taken from the tool box of Neoclassical Theory, supplemented with the theory of imperfect competition and monetary systems.²⁴ From the hermeneutical traditions in political economy and historical sociology, which were rooted in the work of Max Weber, and had been further developed by many authors from Oppenheimer to Sombart, only very few concepts, such as that of the ideal type, found their way into Eucken's design. Among Eucken's merits is a clear explanation of the advantages of a competitive order, which had previously been provided with similar arguments by Barone, Mises, and Hayek.

Åkerman and Scandinavian Institutionalism were closer to these German intellectual movements than American Institutionalism, and for a German reader it is particularly interesting to see what they made of them. When Åkerman was writing, Eucken's book had not yet appeared, but the works and experiences on which Eucken based his work were all available.

Finally, the 1930s were years of intense research into the phenomenon of the economic cycle, the third of the developments which form the background to Åkerman's book. Initially, the debates over the explanations that had been given in the 1920s continued. These had understood the economic cycle on the basis of monetary disturbances of the real economy's equilibrium. Sketches of a theory of the economic cycle were part of the programmes of the major representatives of equilibrium theory around the turn of the century, such as that of Böhm-Bawerk, but these sketches had not been worked out. Even Wicksell's

Interest and Prices (1965 [1936]); German edition: Wicksell 1898), which prepared the ground for modern macroeconomics, according to the author himself, stopped short of an explanation for economic cycles.²⁵ An expert on economic cycles such as Spiethoff, by contrast, had provided a vivid and detailed description of the phenomenon but had not entered into pure economic theory to any significant degree. Besides the monetary explanation, there were the theories of disproportionality and underconsumption.²⁶ Now, in the 1930s, under the impression of a global economic crisis, additional aspects – such as Röpke's secondary depression and Fisher's debt deflation hypothesis, which demonstrated how a disturbance of the economic cycle is propagated and deepens into a crisis – were also taken into account.

Even having explained the periodicity of the economic cycle, which especially caused problems for Schumpeter's theory of waves of innovation, the question remained as to what provided the first impulse for the oscillation. Wicksell had referred to the natural frequency of a rocking horse, which will enter into a periodic rocking movement even if it is not pushed at perfectly regular periods. In a pioneering piece of work, Ragnar Frisch (1933) brought this fundamental idea into an elegant mathematical form that was nevertheless still intelligible to economists. This assigned the temporal factor a new role in economic theory. It was further necessary to analyse how oscillations are superimposed on one another, for which the mathematical method of Fourier analysis was available; economic time series had to be linked, with particular attention to be given to the characteristic delay in the change of values of one series compared to another, which is mediated by the reactions of the human individuals involved. The inclusion of these 'lags' enabled econometrics to establish causes hitherto not identified. Åkerman worked intensely on the phenomena of economic cycles and superimposed oscillations since his dissertation. His *Economic Progress and Economic Crises* shows that Åkerman's methodological reflections in *Das Problem der sozialökonomischen Synthese*, despite its manifold historical and philosophical references, take a specific and concrete problem of economics as their point of departure.²⁷

Thus, *Das Problem der sozialökonomischen Synthese* is situated at a point where several discussions intersect: the question of the relationship between a modified equilibrium theory and economic reality; the question of comparisons between economic systems; and, if we generalise the problem of economic cycles, that of economic dynamics. Despite the great interest that his attempt at a synthesis still holds, it has so far not turned Åkerman into an international Classic author of economics. In this book of 1938, he did not yet find the valid form for his ideas – at least, he continued to treat its topic, here first discussed in German, in several subsequent works composed in his native Swedish. In 1960, a new synthesis appeared under the title *Theory of Industrialism: Causal Analysis and Economic Plans* (Åkerman 1960). It returned to the methodological problem of 1938 and treated it on a more empirical basis. His preface to this book, in which Åkerman presents a short summary of the development of his thought, does not even mention *Das Problem der sozialökonomischen Synthese*. There may be several reasons

for this, among them the wish to distance himself from the group ethics which he discussed at the end of the book as typical of the age.

We are lucky that *Das Problem der sozialökonomischen Synthese* makes available to us the thought of one of the main representatives of the Scandinavian School, an Institutionalists who was close to Myrdal but who engaged critically with the Stockholm School.²⁸ We are thus able to make available again the German first edition of an investigation in which this Scandinavian Institutionalism found an early and forceful expression and which referred more directly to German discussions than its American counterpart. At the same time, this branch of Institutionalism is certainly much more closely linked to economic theory than the older American version. Åkerman wanted to unite the theoretical and historical perspectives. A quotation from his later work may illustrate this point:

Economic calculation and hence models describing such calculations are intrinsically of mathematical form while causal analysis is fundamentally of historical nature. The two antithetical parts of economics concerning logical interdependence and a flow of events through time can not be amalgamated, but in the moment of action they touch one another: then upshots of experience, sifted by causal analysis, is brought to the problem of choice, of action.
(Åkerman 1960, p. 229)

Åkerman's synthesis did not prevail as a programme, but the tension between theory and history he mentions has remained topical. It necessarily had to manifest itself with particular clarity in Germany, when, after the Second World War, the late successors of the Historical School were pushed aside by the progress of theory of the Anglo-Saxon variety (Schefold 1998b). After 1960, this process was completed. In the 1970s, English economists such as John Hicks and Joan Robinson dealt with the topic of *History versus equilibrium* in their own ways, while within the last few years evolutionary economics has internationally gained ground, as evidenced not only by a growing literature, but also by the foundation of societies such as the *Internationale Schumpeter Gesellschaft* or the European Association for Evolutionary Political Economy.²⁹ In the Festschrift which appeared on the occasion of his 65th birthday in 1961, emphasis is put again and again on Åkerman's contributions concerning the dynamic development of economic structures, a no doubt important, if only narrow, aspect of his ideas.

Velupillai (1987) says that in Sweden, Johan Henrik Åkerman was better known than his 8-year-older brother, Johan Gustav Åkerman, whose dissertation on the theory of capital was frequently cited internationally by theorists, due to Wicksell's detailed review of it. Over almost fifty years, Johan Henrik Åkerman published a lot, not only in the area of theory and methodology, but also on economic policy. He was born in Stockholm in 1896 and studied in Stockholm, Harvard, Uppsala, and Lund, where he taught since 1932 and was given the professorship for political economy in 1943. His dissertation on the *Rhythm of Economic Life*, written in Swedish, was one of the first attempts at applying spectral analysis to economic time series analysis, and it influenced Ragnar Frisch and his investigation of the

effect of stochastic variables on fluctuations of the economic cycle. Åkerman's dissertation anticipated aspects of Neoclassical economics (Velipullai 1987, p. 75). Thereafter, his interests shifted towards questions of methodology, which were the subject of *Das Problem der sozialökonomischen Synthese* and which he pursued right until his death in 1982. In the context of economic cycles, he also made use of political cycles in the sense of Kalecki but independent of him.

Åkerman's *Sozialökonomische Synthese* assumes a division of economic science into several parts. There is a descriptive economy (dealing with the history of economy), and then there is an exact economics (which is based on mathematics and on optimisation), as well as in between those two an economics with an orientation towards legal studies and social sciences. However, the core of the economic problem is situated right at the centre of these parts:³⁰

The economic problem consists on the one hand of the task to organise the economy of a collective in such a way that it agrees with given norms or with a certain conduct of life, and on the other hand of the problem of how to explain economic events, i.e. to reach agreement between economic events and economic theory.

(Åkerman 1938, p. 17)

What Åkerman expresses here is a version of the duality that was historically expressed as the opposition between natural and moral philosophy, and he draws attention to the fact that this distinction does not have a correspondence in the form of two kinds of causal analyses. There is, on one hand, a logical dependency of an effect on a cause, which rests on a mechanical model of the object domain and its formal representation. As a result, thought experiments on varying assumptions and the consequences which logically follow from them evoke the idea of a causality, as in Ricardian economics. For Åkerman, these are cases of alternative choices, a fact that emerges most clearly in the Neoclassical version of the theory. These, he juxtaposes with an 'analysis of the driving forces which' . . . aims at a primarily intuitive determination of the central factors of causality' (ibid., p. 54).

In this perspective, the decisions of individuals are determined by psychological and social factors which are reconstructed and comprehended and which, if quantified, find expression in the mutual dependence of time series with specific time lags. Thus, economic behaviour is described and, verbally or formally, reconstructed, but it does not follow from a logic of optimisation.

In two slowly proceeding and well-informed chapters, Åkerman pursues this duality through economic and theoretical history. He discusses the economic styles and systems (without strictly distinguishing between these two) of feudalism, Mercantilism, liberalism, and, finally, planned economy, on the basis of historic description, on one hand, and on the basis of an ideational conception, on the other. Partly, he presents a sequence, a historical accumulation of traits, partly alternative characterisations. There is no strict correspondence, he says, between content and expression, between the form of economic life and the economic theory it produces. Ideas that suited older situations are sometimes

carried along across centuries. Åkerman's historical retrospection from the perspective of the situation in the 1930s is also informed by his understanding of theory. In modern accounts of the historical development of theory, Classical and Neoclassical equilibrium theories, for instance, are depicted somewhat differently; in particular, the 'temporal aspect', which for Åkerman is *the* novel discovery, is treated more thoroughly and extensively. Nevertheless, Åkerman's account of the early days of research on economic cycles is still of special interest for the history of economic theory.

Next, Åkerman distinguishes between three 'theses' (though it might be better to call them 'approaches') which he encounters in the history of theory. Their combination is meant to lead to the socio-economic synthesis. Looking at the first of these, the approach of equilibrium economics, he observes a fluctuating emphasis on either functional interplay within a general equilibrium or genetic and causal explanations of value. Walras he associates with the former, Jevons with the latter. Equilibrium theory appears to him as nothing but static comparisons aiming at an explanation of price changes under 'exclusion of the temporal moment from consideration' (*ibid.*, p. 143). He could not possibly be familiar yet with Hicks and Samuelson's development of the theory into a stability analysis that is related to economic dynamics. Although he misses the component of time and attention to institutions, he acknowledges the validity of equilibrium economics.

But as soon as one expects *more* from equilibrium economics than a presentation of fundamental types of logical thought and typical behaviour within the economic sphere, one is bitterly disappointed. Equilibrium theory is not suitable as an *instrument for causal analysis* because it cannot follow, and cannot explain, the real economic processes that take place over time. In reality, there are no 'given' and 'looked for' variables; there is nothing that would correspond to a solution with 'an identical number of equations and unknowns', and no 'disturbances' of the kind of thought experiments.

(*Ibid.*, p. 145)

Having turned to the theory of capital, he reaches the remarkable conclusion that 'rent on capital', i.e. the rate of profit, cannot be explained within the framework of equilibrium analysis. Thus, we probably have to conclude, he demands a dynamic theory of income distribution, though he was not able to formulate such a theory himself, as there were no conceptions of dynamic equilibria available yet. Åkerman instead turns to the monetary variables which – in that respect, at least, the approaches of Hayek and Keynes agreed – were meant to introduce a dynamic element into equilibrium theory and realises that this addition, by itself, is not sufficient.

Åkerman then tries to make a constructive contribution to 'time economics' in accordance with the other of his two basic approaches. As modern growth theory only took on more differentiated forms in the 1950s, the result is a mixture of empirical and qualitative investigations which present a somewhat diffuse overall picture. Sombart still had sneered at the oppositional pair 'static' and 'dynamic', which he thought originated in J. S. Mill:

Especially American political economists, for instance J. B. Clark, like to work with these terms, as well as those who follow the Americans in Europe, such as for instance Jos. Schumpeter. It is without a doubt the poorest of formulas which has nothing but the more or less meaningless categories of 'being such' and 'becoming different' as its content.

(Sombart, 1950 [1929], p. 186, my transl.)

Åkerman, whose work is more substantial than that, points out that empirical representations of temporal processes, such as the Harvard Barometer – i.e. time series of production, interest rates, and the like – are all nothing but indicators for what is actually meant to be captured at the socio-economic level. And even what is important in terms of social policies, e.g. a food price index, is not necessarily important in terms of causal analysis. It was therefore impossible to achieve a proper analysis of causes without drawing on sociology.

Logical time economics is . . . as much of a formal nature as logical equilibrium economics. The latter highlights fully and in detail the momentous interdependence of all factors that have been taken into account, the former shows the variations of all factors as *time-dependent and therefore causally conditioned phenomena*.

(Åkerman 1938, p. 173)

Hence, the temporal determination of phenomena points to their causes without yet understanding, purely on the grounds of the logic of their representation and temporal fixation, what these causes are.

Åkerman therefore turns to sociology which, however, fails to provide the desired coherence:

We are thus faced with the peculiar situation that we fully realise how necessary, yet altogether insufficient the equilibrium and time economic theses are as the explanatory basis for our interpretations of economic life and development. At the same time, we must recognise that the sociological sciences, which are meant to fill this gap, do not allow to be synthesised into a complementary thesis.

(Ibid., p. 187)

At this point, Åkerman again tries to extract a viable approach with the help of a historical investigation of doctrines, this time of sociological doctrines. On one hand, we find an emphasis on how individuals are determined in their views by the group to which they belong, while, on the other, the goals directing the individual's behaviour are said to result from the structure of the individual's personality, which consists of inherited layers and layers above these where an active reflection on the thinking of the surrounding collectives takes place, a reflection which allows the individual to form evaluations. If an individual occurrence is to be explained, ' . . . it seems plausible to put emphasis on the suddenly emerging evaluative aspects' (ibid., p. 204), which then can be assigned a causal power.

Åkerman summarises:

The principle of interdependence in equilibrium theory, the causal principle in time economics, and the evaluative principle in sociology illuminate social and economic processes from different perspectives. All three principles are necessary for an understanding of economic processes, and none of it is sufficient by itself to explain any of these processes.

(Ibid., p. 208)

In the following chapter, Åkerman interprets a significant number of historical examples – in particular, from the theory of economic cycles and economic development – as the result of ‘bilateral syntheses’ between equilibrium economics and time economics, between equilibrium economics and sociology, and, finally, between time economics and sociology. The thesis, close to Weber’s work, of *homo oeconomicus* as an ‘ideal type’ under capitalism that develops along with this economic system, a thesis which from Åkerman’s perspective, as he says, is ultimately to be rejected, he associates, for instance, with the combination of equilibrium theory and sociology. Apart from the question of the extent to which such an approach would be viable at all, he objects to it on the grounds that the Classical authors did not apply it because they only assumed the associated form of purposive rationality but did not explain it (ibid., p. 227).³¹ In addition to the German school of thought represented by Weber, Åkerman discusses the Italian (Pareto), an American (Veblen), and even a Russian one (Tugan-Baranowski).

The combination of equilibrium economics and time economics leads on to a consideration of theories of the economic cycle, which we shall leave aside at this point. A proper synthesis of time economics and sociology, Åkerman says, does not yet exist. He looks for initial steps in this direction in connection with, for instance, reflections on demographics and then returns to the problem of types of economic systems.

One might expect that Åkerman’s analysis of types of economic systems, based on his Trinitarian theoretical approach, would turn out richer than that of the more schematic Eucken, who, in the language of the work discussed here, uses exclusively the concepts of equilibrium economics and monetary theory. But Åkerman only juxtaposes economic systems based on free competition and planned economies to each other, each in a pure and approximate form. He does not use his by now further refined concept for a more detailed investigation of the sequence of economic styles following each other under feudalism, Mercantilism, and so forth, which he mentioned in an earlier chapter. He sees his two approximate types realised by the situation in England around 1860 and Russia around 1930, respectively. He considers the Sweden of his day to be a mixed economy. An economic philosophy of history, he says, must combine the formation of types with explanations for change. The more clearly the contours of the types are worked out, the more the moment of change moves into the background (ibid., p. 256), until, finally, the abstractions of the philosophy of history make symbol and reality fade into each other – are major banks a determining factor of reality or a distinct expression of the capitalist economy?

In today's understanding – which Eucken already subscribed to, against a naïve realism – every correctly formulated theoretical proposition is always 'true', in the sense of being free from contradictions, but can only 'actually apply', i.e. only gain validity, 'if the constellation of conditions pertaining to it exist in a particular location at a particular time'.³² The corresponding insight in Åkerman is that the calculus governing actions on which equilibrium economics or a formalised time economics is based is never fully realised, and that even if individuals follow this calculus, the question remains as to why they do so – why, in a given historical situation, they actually follow the theoretically predicted pattern of actions. In other words, the validity of Neoclassical action theory is always and fundamentally in question.

However, the theory of expectations makes it possible to include the results from the analysis of action motivation into formalised theory, forcing the latter to modify its previous assumptions regarding equilibria. The distinction between *ex-ante* and *ex-post* factors made in the Swedish School and Keynes's hypotheses on the role of expectations in establishing underemployment equilibria belong in this context.

At the end of his book, Åkerman relates his conclusions to the most recent controversies of his times; his polemics against the relative merits of Keynes and the Stockholm School, respectively, are part of this. All of this somewhat diminishes the overall value of the enterprise, because since then the perspectives have changed, and we have gained more experience and knowledge (or, at least, so we believe). Åkerman, for instance, suggests using the ratio of state expenditure to GDP as a 'planned economy indicator', in order to determine the degrees of admixture between competitive economy and planned economy, without, however, distinguishing between state transfers which follow from the execution of existing laws on social redistribution, thus are solely based on routine practice, and new, goal-directed state planning. Lindahl (1950, p. 51), though, praised Åkerman, in particular, for his understanding of planning in mixed economies. Åkerman also introduces a type of causality for the distinction between types of economy, one that is based on the question of whether the 'secondary self' of the individual or the collective provides the guiding norms. Form and content of a decision are meant to allow us to establish the source of the causality involved. Finally, Åkerman wants to assign a more wave-like movement to competitive economies as their 'procedural type' and a more linear movement to planned economies. Indicators for these types of movement are, for instance, the development of prices. The world has since been able to witness that the linearity of planned economies does not extend very far.

On this basis, Åkerman attempts a historical categorisation of types of economic cycles after 1873, and asks 'whether we have not reached the stage at which major turning points in the economic cycle are identical with structural transformations' (Åkerman 1938, p. 295).

Åkerman compares these reflections on causal analysis with the analysis of alternatives in a discussion of forms of microeconomic decision-taking. He also includes the state in the latter, looking at decisions such as, for instance, the one

on choosing the 'right rate of tax progression'. As economic experiments can hardly be repeated, due to the changes in conditions, such analysis of alternatives must essentially be based on logical calculations and remain separate in character to causal analysis. Analysis of alternatives also exists within approximations to planned economies which assume a given physical inventory and envisioned goals regarding supply and future capacities and then try to realise these goals by means of 'work orders'.

Thus, from the perspective of causal analysis, even repetitive phenomena each time appear unique, because they become manifest in ever new combinations and under new causal conditions, while in the analysis of alternatives, which limits the horizon within which the phenomena appear, they are considered repetitive situations of decision-making. Åkerman holds that a perfect synthesis of these two perspectives can never be achieved, but a mutual approximation is possible, if the assumptions on which the analysis of alternatives is based are differentiated further. Causal analysis, understanding, requires a temporal distance to the processes. The historians are right in claiming that some time must pass before a particular question can be addressed. The analysis of alternatives, by contrast, can always set out from the here and now.

The very last chapter of the book tries to draw conclusions for economic ethics. Åkerman confronts the problem of a collective ethics based on 'allegiance to the group', where 'group' may refer more specifically to a social stratum, the nation, or a religion. Because groups influence one another and undergo changes themselves, it is necessary to go beyond individual groups and look at their dynamic interplay. Åkerman's intention is by no means to postulate absolute, time-independent ethical maxims but, rather, to characterise the ethical principles informing different periods and economic systems. Thus, he attributes a 'dynamic understanding of an atomistic economy' to liberalism and a 'dynamic understanding of a group economy' to planned economies (*ibid.*, p. 322). His formulation regarding 'allegiance to the group' may have captured a kind of ethical norm which fitted well not only in Sweden, but also in England (if we think of the mutual relationship between Conservatives and Labour, who both feel committed to class and party), but which also matched the ideologies of the Soviet Union and National Socialism. Thus, the book ends by confronting the reader with uncomfortable questions, which, however, are already prefigured in the theoretical problem which formed Åkerman's point of departure: How is a socio-economic synthesis achievable? By limiting the answer to the procedure which Åkerman describes as the analysis of alternatives, one posits the individual as absolute but evades the problem of the individual's historical formation and the moral duty it has internalised. By only pursuing what is individual, we never reach the level of theory.

The development of economics did not stop after Åkerman. The concept of equilibrium was made dynamic, new forms of behaviour are modelled in theory, as demonstrated by game theory, for instance. The analysis of repeated games can provide explanations for changes in behaviour. Econometrics, as a field for the application of Åkerman's time economics, has undergone an enormous development after the Second World War. Ultimately, it seems, the problem

of a socio-economic synthesis drowns in the flood of new insights and knowledge. Are there not even attempts at deriving part of economic ethics from a new institutional economics which is based on Neoclassical theoretical tools? But whoever looks at processes of decision-taking from an ethical perspective will in the end be forced to confront the tension between the manifold influences on the individual's will and the justifications for a moral ought and thus to move outside the world of models again – to which he then returns in order to formulate *theories*.

The problem of a socio-economic synthesis, to which Åkerman so persistently drew our attention, thus will stay with us, and this justifies the inclusion of the book in which he provided the first valid formulation of it in the series of the *Klassiker der Nationalökonomie*.

Alexander W. Chayanov's *The Theory of Peasant Economy*

Russian economics is little known in the West, despite its interesting history, the twists and turns which have mirrored changing political conditions. Emigrants such as Vassily Leontief, the theorist of input-output analysis, or Alexander Gerschenkron, the economic historian, both became famous beyond Russia. Kondratiev is often cited in connection with the long cycles of economic development to which he gave his name. War Communism, experiments with planning, the return to the market economy under the New Economic Policy, the transition to large-scale economic planning under Stalin's rule, all of these were initially openly introduced, were intellectually challenging, and, until the suppression of the opposition, were also accompanied by very stimulating debates. The main protagonists in these debates are listed in the history of the Soviet Union, but more as representatives of political positions than as economic specialists. This is much the same with the economic texts by the first Soviet leaders, Lenin's *The Development of Capitalism in Russia* or Bukharin's critique of bourgeois economics. Only Feldman's growth theory has made its way into macroeconomic textbooks, because his model presents the possibilities of assisting growth through reducing consumption and forcing the production of capital goods (Robinson and Eatwell 1973), a practice later taken up by Stalin at an enormous human price.

In the West, Russian Marxists and dissidents were treated primarily as part of a political history; the important emigré economists were, by contrast, treated as scientists. Blinded by the temporary economic success of Stalin, which provided the basis for his military power in the Second World War, the economic success of Czarist Russia was little regarded. Little attention is devoted to the economics which were taught at the main universities in St. Petersburg, Moscow, Kharkov, and elsewhere or to those ideas which survived the revolution for a few years. This is regrettable, because Russian economics at the turn of the twentieth century was an object of great interest. Scholars looked to it for solutions to the urgent problems of an impoverished peasantry, a rapidly increasing industrial proletariat, the high cost of governmental administration, and faltering development

in the surrounding countryside. Russian economists were familiar with Western European literature – and that of the Germans, in particular. They sought syntheses and struggled to achieve a successful reconciliation between abstract-theoretical and historical-ethical economics, and, alongside the political-polemical, there was also a technical-academic confrontation with Marx. During war, revolution, and the persecution of the Russian intelligentsia, many of these approaches were lost, and it can be asked whether there is not a certain one-sidedness inherent to economics today because communism, fascism, and National Socialism prevented a fertile development of these syntheses.

Alexander V. Chayanov has been rediscovered as a classic several times. He inspires a particular fascination because many paths of historical development connect in him. His basic ideas were developed in Czarist Russia but written down and published in the early years of the Soviet Republic. He was also familiar with German economics because of periods spent abroad, and he even published his main work first in German. Readers of this text will immediately recognize he achieves a synthesis of the kind often called for in Germany but seldom attempted: it is inductive, observations are brought together, and the leading ideas are developed against an extensive background of statistical material, which are then supported by an individual theoretical model and placed in relation to one another. The theoretical tools employed come from the Marginal Utility School, even if Chayanov uses mathematics more freely than Menger or Böhm-Bawerk. While Auspitz and Lieben (1889) worked with diagrams, Chayanov draws on simple statistical methods, such as the calculation of correlation coefficients.

Both topic and the main thesis are guaranteed to excite the historical imagination. Chayanov treats the Russia of the early 1920s quite properly as a lesser developed agrarian state. Agriculture is the largest sector, especially when measured by population, and it is traditionally organized into family farms. Large landowners – owning large stretches of land parcelled out among medium-sized farmers, wealthy enough to cultivate the land and using wage labourers – are not typically dominant. Instead, the land is divided into parcels upon which independent families farm without being able to afford paid labourers. As a rule, these families live so far from large cities that a non-agricultural second income normally cannot be found. The family finds itself isolated, and the able-bodied members have to feed the less able-bodied and those who are not capable of working. With certain restrictions, land could be partially redistributed within villages, and families could lease land to other families or lease land from them, but essentially each family is still forced to rely upon its own means. Household members act according to a logic which Chayanov identified and analysed, for which he has become famous.

We should, first of all, recognize the theoretical achievement that this represents. The text is based on the previous work of other Russian and some non-Russian agrarian economists, who are duly cited in the book. The reader will, however, notice the passionate meticulousness with which Chayanov pursues his line of questioning. Biographical descriptions of him make it clear that he was not the kind of person who sat back contentedly after writing down a new idea.

Rather, he pursued his subject matter until he reached the point where his thesis was both empirically and theoretically defensible and the economic implications established. He also had to develop his own decision theory for the peasant family enterprise. In part, it led to results different from those typical of household and firm in Neoclassical Theory, for within a peasant family enterprise, household and firm could not be separated. On the whole, labour – since it was not financially remunerated – is assessed in direct relation to the satisfaction of the needs of the family members who supply the labour, and this assessment varies according to economic situation, family size, and composition (itself a result of the family history). Where wage labour prevails, conversely, all workers generally receive the same hourly wage.

The development of historically specific economic theory had often been called for, especially by members of the Youngest German Historical School, but they contributed virtually nothing to such a development. In the 1920s, Schumpeter argued that if Schmoller and Edgeworth were brought together, the future would look after itself. Instead of doing that, Schumpeter himself and most modern economists focused their efforts entirely on the development of a pure Neoclassical model of competition, neglecting the examination of specific models, such as that of a Russian peasant family farm. Chayanov's terminology, borrowed from the Marginal Utility School, appears quite conventional. However, while earlier theorists of marginal utility believed they were developing a timeless, basic model, Chayanov emerged as a modern instrumentalist. He borrowed tools from what was, at the time, a novel approach and employed them in a different way than their inventors had.

Chayanov's political orientation showed courage, and it would in the end cost him his life. At the beginning of his book, he pays tribute to the new situation in revolutionary Russia, referring to Marxist leaders such as Kautsky and Lenin. These two were, of course, opponents; the former, once looked upon as the spiritual descendant of Marx and Engels, had reverted into the role of a harmless, social-democratic oppositional writer, while the latter was the leader of a politically and militarily triumphant revolution in the country with the largest land area on earth. In the third volume of *Capital*, Marx had extended his theory of concentration to agriculture and thus given impetus to the notion of combined development. The proletarianization of work would be universal, industry and agriculture would be exposed to concentration, and a revolution would finally be led by unpropertied industrial and agricultural workers, who, on the eve of the revolution, made up the mass of the population. The morning after, they would all be working for a new society. The idea that agricultural production must be combined into large collectives already played a role for Lenin and would be implemented by Stalin, with disastrous consequences for Russia's agricultural structure. Today, following the turn to capitalism, the Russian agricultural sector represents one of the largest structural obstacles to the development of an integrated market economy.

The idea of a thoroughly Christian, family-based peasant culture had been popular in Imperial Russia. In such a culture, families in a small village formed a community with common lands, and they practised land redistribution and other

cooperative elements. A political programme which rivalled pre-war Russian social democracy proposed that socialism in Russia should be brought to life through a secularization of this idea of community, transforming its institutions. It is quite astonishing that Marx learned Russian in his later 50s while revising the third volume of *Capital*, so that he might become familiar with Russian agricultural conditions. The resulting modification of his perspective was expressed in his famous letter to Vera Zasulich:

The analysis presented in 'Capital' contains absolutely no evidence – neither for nor against the viability of the village community; however, the special study that I carried out on it and for which I have created material from original sources has convinced me that this village community is the foundation of Russia's social rebirth. In order for it to function that way, the destructive influences, which are assailing it from all sides, must be eradicated, thereby ensuring normal conditions for natural development.

(Marx 1989, p. 346)

In the first German edition of his book, Chayanov does not view a *peasant culture* as having an influence on family economy; instead, influenced consciously or not by contemporary ideas, he traces the influence back to *biological regularities*. Families have to reproduce. When children are born and parents are no longer able to work, a middle generation has to support a larger number of mere 'eaters' until the children themselves are able to contribute their labour, and the parents die off. Now the family members capable of working are once again in the majority, until they age, and the cycle begins all over again. These and similar basic patterns make up the central element of explanation, supplemented with remarks about social divisions and the custom of renting or leasing land when necessary, but neither employing non-household members nor hiring any out. Once we label this biological interpretive model 'materialist', we recognize that it offers a terminology with which the family economy could have been ideologically incorporated into the new state. Another, bloodier, way was chosen.

A more accurate cultural interpretation of the family economy has, however, become a primary reason for Chayanov's current importance. Economic anthropology has identified a whole variety of forms of family economy which researchers have sought to classify, for example, according to the predominant methods of production. Meillassoux (1975) presents characteristic family structures with particular relations of dependence for hunter-gatherers, slash-and-burn farming, and still others in developed agriculture. Sahlins's book *Stone Age Economics* (1972), which turns on relationships Chayanov had pointed out between job performance, production level, and family needs, caused a furore. Why does the family produce as much as it needs and not as much as it can? According to Sahlins, they do not restrict their consumption – at least, in the case of primitive communities – because there is scarcity, labour is hard, and thus only the most necessary work will be done (so that additional mouths will only reluctantly be fed with additional work). Instead, they are affluent societies which enjoy a fundamental happiness

because they understand in an elementary way how to be satisfied with less and, in addition, find ways to avoid the pressure of a higher population density. Those who are able to reduce their needs to satisfied happiness enjoy an enviable surplus, as King Alexander recognized in the philosopher Diogenes, when the latter, asked to make a wish, requested that the king stop blocking his sun so he could enjoy its radiating warmth. Sahlins did not support his thesis about the affluence of primitive society with this philosophical *aperçu* but with evidence drawn from ethnological studies, prompting a discussion that continues to this day.

Chayanov has also long exerted an influence on development theory. His work was read in Japan and India, countries in which the peasant family economy, with its village structures, essentially co-determined the fate of development. Published in 1966, the English translation of the revised Russian version of Chayanov's book also contained a translation of the essay 'On the Theory of Non-Capitalist Economic Systems.' This book, along with the essay, had a fundamental impact on Anglo-Saxon discussion.

Born in 1888, Chayanov came from the European part of Russia. In 1913, he became an assistant professor in the Agricultural College in Petrowskoje near Moscow. He became director of the Senior Seminars in 1919 and became director of the Research Institute for Agrarian Economics and Policy in 1922. In 1930, he was arrested and vanished. No completely reliable information about his disappearance and death exists. Chayanov published a great deal, including works of literature. He was active in economic policy and was particularly interested in the promotion of cooperatives.³³

There is an overview in the (first) *Palgrave Dictionary*, still worth reading, on the history of Russian economics, in which Chayanov played a part, under the keywords 'Russian School of Political Economy'.³⁴ The Russian economy was, from its very beginnings, determined by political developments. After a few early tracts, in which ideas similar to those of Western European Mercantilism are proposed, broader reflection upon economics emerges under Peter the Great, paternalistic at first but then, under Catherine II, open to the ideas of the Physiocrats. Discussion of the abolition of serfdom began here, too. Adam Smith becomes known in Russia through a Russian translation and through Christian Schlözer's writings. Heinrich Friedrich von Storch's *Cours d'économie politique* was of particular importance (Schefold 1997i). Storch was a Russian citizen, however of German origin (born in Riga in 1766). He toured Germany and France and then became a professor in St. Petersburg, contracted to teach the Grand Dukes Nicholas and Michael and developing his textbook, also influential in the West, from these lectures. Storch became politically powerful simply because he had taught the heir to the throne. Roscher considers that Storch initiated a Russian-German school of economics, in which the historical consideration of developmental stages and the cultural determinants of economics extended Classical Theory. It is, of course, also said that the reaction after 1812 favoured a retreat of Russian economists to historical studies.

After the emancipation of the serfs in 1861, a new economic phase set in. Intensive study of the agrarian question led to the collection of a large amount of material. The most important Western authors appear in Russian, and the

influences of Western liberalism, of German 'professorial socialism', of socialism, and of Marx, in particular, began to compete with one another. Adolph Wagner's *Die russische Papierwahrung, eine volkswirtschaftliche und finanzpolitische Studie nebst Vorschlagen zur Herstellung der Valuta* [Russian Paper Currency: An Economic and Fiscal Study along with Suggestions for the Establishment of the Valuta] (Wagner 1868) demonstrated the continued existence of the Russian-German School. The text was translated by Bunge, a future minister of finance. Until the turn of the century, protectionism was typical of industrialists. Besides the agrarian question, there was the labour question. Tugan-Baranovsky, Struve, and Plekhanov represented the Marxists. The *Palgrave* article (written in 1897!) notes of their arguments:

This school believes that economic development in Russia will follow the same lines as it has done in Western Europe; that no workmen's associations, and no peasant communities will save Russia from the calamity of the supremacy of capitalistic economy, that in the development of manufacturing industries the system of small industries now connected with agriculture will disappear, that the peasantry in the future will change into a land-less working-class, and that the sooner this wearisome process comes to an end, the sooner it will be possible to enter on the organisation of a working class of society which thus belongs altogether to the future.

The newspaper published by the group was banned.

Other contemporary Russian economists developed arguments which drew on German or classical theory. V. K. Dmitriev, for example, formalized Ricardian theory, an English translation of his papers which appeared in 1974 collecting papers which had originally appeared between 1898 and 1902.³⁵ In later essays, Dmitriev sought to create an organic synthesis of the labour theory of value and the Marginal Utility School.

While Dmitriev sought to make a high-level connection with the abstract theories of Western schools, W. Gelesnoff attempted a synthesis of various approaches based around social economy. His book is based on lectures given at the turn of the twentieth century, a German translation appearing in 1918 (Gelesnoff 1918). In a 1921 review, Edgar Salin called Gelesnoff's book the only textbook worth mentioning alongside the works of Schumpeter and Amonn; it provides, 'although written by a Russian, essentially on the basis of German theory, a tenable and thorough introduction.' Gelesnoff attempts to be fair not only to the younger Historical School but also to the Classical School, the Marginal Utility School, and Marxism. The openness to such different trends in Western economics, which we find with Russian authors and see established in their own tradition, forms the basis upon which Chayanov developed his own work.

Large-scale or small-scale enterprises: which represents the future for agriculture? Chayanov's book begins with this old question. For many techniques of cultivation, the appropriate, optimal size of the enterprise could be empirically determined: most enterprises hardly got anywhere near this optimal size.

Nevertheless, small-scale peasant farming proved resilient. Chayanov proposed an explanation for this resilience. The peasant family, a group of people who eat at the same table, ensures the continued tenacious existence of the small-scale operation. While it is true that family structure is not the same everywhere and is subject to individual variations, basic patterns periodically repeat. The labour input of the family must be in proportion to the number of mouths to be fed. The intensity of labour in the field also fluctuated significantly. Peasant labour was not fully exploited, as surveys showed, a fact which Chayanov traces back primarily to seasonal fluctuations (Chayanov 1986, p. 74). The more unfavourable the relationship between consumers and workers in the family, the more work that has to be done and the more intensive the work will be. Chayanov postulates that marginal labour input and marginal utility must be in equilibrium. The annual labour input, measured in terms of money, is entered on the abscissa, while the marginal labour input and the marginal utility are entered on the ordinate. The falling marginal utility curve runs counter to the rising curve of marginal labour input, although the latter is flatter when conditions are better.

Labour costs are not included in the determination of equilibrium. The valuation of labour is not given exogenously, as with wage labour in an enterprise; it is instead based on the internal comparison with achievable utility. Self-exploitation allows the family community to survive in difficult times.

It could be added that the same phenomenon can also be seen in other households. There is still no general solution for the valuation of housework, whether for earlier rural economies or for the modern city. Today there is still no systematic wage payment for stay-at-home wives. If housewives were paid an average wage of €1,500 monthly, and each family receiving this money were at the same time charged an additional tax of the same amount, consumption and prices – with the exception of transaction costs – would remain, on the whole, unchanged. The autonomy of the household would, however, be affected by monetary taxation. It would be necessary to develop standards for the various forms and levels of intensity of housework, in order to make it possible to pay an appropriate wage in each case. This kind of monetarization occurs in the transition from feudal to capitalist production and is generally considered to be efficient. As we have learned from Witold Kula (1970), during the eighteenth century large Polish estates produced corn using serfs and then sold the product at a profit, shipping it to Western Europe. Polish agriculture was still very competitive, despite the trading distance, because the serfs were not paid any money wage, as workers would have been under capitalist relations. Instead, peasants scraped their subsistence from the small parcels of land assigned to them. If it had been necessary to pay the workers money wages, the estates would have made losses.

In Chayanov's family economy, farmers were generally independent and free to combine factors of production as best they could, according to what was possible. The opportunity to purchase or to lease additional land or find extra work in part-time jobs did often prove to be quite limited, so that the family had to adapt itself to a minimum. The poor family sought an economic equilibrium at a lower standard of living (Chayanov 1986, p. 101).

The employment of labour outside agriculture led to especially surprising consequences. High grain prices and low wage rates for field workers are correlated because in times of crop failures, prices are high, fewer labourers are needed in agriculture, and many urgently seek work elsewhere. Even fur and grain export developed inversely, for if the grain yield was reduced, the farmer set traps. Ultimately, the farmer still had the option of planting a more labour-intensive product on a particular plot of land to create a use for a potentially surplus labour force (*ibid.*, p. 109).

Particular forms of behaviour are also attributed to the Russian peasant family in relation to capital. Since credit plays a subordinate role, what the family uses as capital must first of all be withdrawn from that which is destined for consumption. Deviating from a utility theory which assumes that all goods are mutually substitutable, Chayanov postulates a hierarchy of needs. The satisfaction of basic needs comes before higher needs and all capital uses. Again, he notes strange consequences: Threshing machines, which could substantially reduce the threshing work postponed to winter when there is less work, are purchased by farmers only where non-agricultural employment makes it seem worthwhile during the winter to do work other than threshing. The sum total of this knowledge

is the result of almost twenty years of work by a number of Russian economists who had before them the exceptionally rich material collected by Russian zemstvo statistics over half a century. In its present systematic form, this gives a more or less finished outline of peasant farm theory.

(*Ibid.*, p. 233)

In chapter V of his book, Chayanov deals with the social organization of the peasant economy. To explain an unequal distribution of income and wealth, he cites, in particular, demographic development and so modifies the argument that social differentiation is class-based.

At the end of this chapter, Chayanov attempts a graphic representation of market structures, which at first appears to have no relationship to the distribution problem, until he finally makes his purpose clear:

However, if commercial capital and money capital controlled this route and the connection between the peasant economy and the world markets, it still left peasant economies without wage work and the basis of their existence entirely untouched, yet naturally turned them into objects of its exploitative activity, just as the English East India Company exploited the Indian population active in agriculture.

(*Ibid.*, p. 109)

Chayanov views the world economy as a complex structure, in which capitalist relationships predominate, without entirely suppressing all other production forms.

A location theory is now developed for the peasant family economy, which presupposes an explanation of rent and land price. Here Chayanov ran into

theoretical difficulties, because the individual adaptation of the single family economy to its inner structure, thus specifically to its level of wealth and the surplus of non-working versus working members, makes a general differential rent theory of the Ricardian sort impossible. Even on homogeneous land, the conditions for its cultivation are non-homogeneous. The possibilities presented by lease payments have to be assessed from the point of view of the individual enterprise. In a diagram in which the curves for marginal utility and marginal labour yield are both entered as functions of the annual labour input of the family, Chayanov represents the effect of a lease payment as an upward shift of the (falling) marginal utility curve (for the family budget, in terms of roubles, will be reduced, so that the marginal utility of the rouble increases), while the leasing of land moves the (rising) marginal labour input curve to the right (it is easier to work, hence one operates more extensively, on larger parcels of land). The leasing of additional land causes the household equilibrium to move to the right and, at the same time, slightly up or down. If it moves down, the new equilibrium is more favourable, because the marginal labour input is reduced, and the lower level of marginal utility indicates a higher total utility.

This briefly summary raises several questions, some of a formal nature which we cannot go into here. In any case, it only explains which leasing rates are acceptable for one family; to go from there to a general determination of lease rates in the family economy would require considerably more. Just the same, Chayanov's approach can explain certain observations, such as why families with an extreme lack of land are willing to pay 'starvation rents.' The family economy could continue producing under conditions where a farmer calculating along 'capitalist' lines would have to withdraw. At the same time, the family economy might be more prepared to carry out improvements.

Following the description of how the family economy managed to adapt to local conditions of production with individual variations, it remains to apply the results, including the local conditions of demand, transportation costs, and population density, to a Thünen-style location theory. A contrast between 'overpopulated' and 'non-overpopulated' areas becomes evident; in the former, we find high labour intensity, cultures of great 'labour capacity,' high land and leasing prices, low wages, and few opportunities for non-agricultural employment (*ibid.*, p. 135).

The remaining task is to estimate organizational possibilities and to design an economic policy related to the properties of the household economy. This was not done in Russia, with dreadful results. Agrarian policy of Western Europe was, by contrast, continually challenged during the twentieth century by a rural economy that held fast to behaviour that shared many of the characteristics of the family economy analysed by Chayanov. There was an effort to slow migration from the countryside with agricultural loans, to promote modernization, while, at the same time, preventing any radical change to the rural landscape. Whoever travels in Germany today in an east-west direction cannot help but notice the difference between the east, in which Russian influence has prevailed since the war, and the west where farmers have long assumed a key political role between left and right.

Chayanov (as did Wicksell) published some of his most important texts in the German language, though he remained wholly the Russian economist of the revolutionary period, moved both by the *Sturm und Drang* of the epoch and by conservative ideals. In 1922, he reported on the conditions of the Russian agrarian economy for *Schmollers Jahrbuch* (Chayanov 1922). Here, again, you can find a dense explanation of the backwards-leaning supply curve for labour:

The uniqueness of the peasant economy we have described provides an opportunity to explain why wages move in an inverse relation to bread prices in Russia, while in industrial nations the movement of the wage rate adjusts to the prices of foodstuffs. The lowest wage rates appear in Russia in years of crop failures, where the needs of the peasant families cannot be covered by the returns on their economic activity, and the peasantry releases its free reserve of working energy onto the labour market in search of income.

(Ibid., p. 114)

His contribution to the theory of non-capitalist economic systems is far more interesting (Chayanov 1986, pp. 1–28). An entire spectrum of historical economic systems is developed here – not with the intention of exhaustively describing all of the peculiarities to be found or even all conceivable possibilities, but rather a selection of the primary forms, with variations drawn from the place of household economy in Russian history. The capitalist system is equated with the maximization of net returns, calculable if wages are paid. Under slave labour, for which a slave price must be paid, the conditions for the calculation are different. The author assesses the preparatory work as follows:

The German historical school undoubtedly has the extremely great merit of having written about the economic past (especially the Germano-Roman and the ancient world) and of having disclosed their detailed morphology; but even the most thorough and precise description as such is unable to provide a theory of the economic facts described.

(Ibid, p. 2)

Even theory is not sufficient; Chayanov set himself the goal of contributing to a more rational economic policy by making historical forms of the economy known. His remarks on the peasant family economy do not require repeating here, and his thoughts on the slave economy are at a relatively high level of abstraction. He was quite aware that it would be necessary to differentiate between various phases of the Graeco-Roman world, and that the reality in the South of the United States was something altogether different. He acknowledged the contrast between the pure form which he had developed and the historical reality, especially in regard to the Greek *Oikos* economy (ibid., p. 22).

For our purposes, the examination of Russian serfdom is more important; Chayanov speaks of the agricultural enterprise of *obrok* farmers, organized along lines familiar from the family labour economy. The difference is that the family

not only had to provide for itself, but also raise the *obrok* to pay off the owner – at the cost of the family's own needs.

Chayanov thus manages to make a comparison between two systems, the slave economy and the *obrok* serfdom economy. Both are market economies, to the extent that goods are traded. In the slave economy, however, capital is advanced by the owner, including room and board for the slaves, while in the serf system, capital goods remain in the possession of the landholders. There are maintenance costs for slaves, but an indivisible return on labour for the family of serfs. What the slave produces for the master is partially designated profit, partially slave rent. The serf is required to make the payment (the *obrok*), but Chayanov also speaks of a price for the serfs themselves.

Differences arise in dealing with the systems. With slaves, there is often a shortage, particularly when there has been no recent military victory, when not enough slave families form, or when slaves are freed according to ancient custom. In the peasant family economy, there can be periods of great population increase. Chayanov speaks of the paradox of a negative overpopulation yield, when the product surplus which can be siphoned off sinks, due to the pressure of population; only emigration and colonization can then remedy the situation (*ibid.*, p. 20).

Finally, a half-dozen economic systems are distinguished, and the economic categories of each system are presented in a table. Communism and collectivism also appear here. As economic forms, he sees them as reducible to a list of consumption and production plans, both of which require the use of force in carrying them out. How such a system could be realized could hardly be described until it had been observed in action. Chayanov cites a range of problems in the functioning of the planned economy, particularly the determination of needs and the establishment of labour discipline. The problem of promoting technical advance is less clear to him, as is respect for the freedom of consumption. He seems to consider the planned economy impossible, in principle, but he hesitates to state this openly.

While the basic categories in his book come from the Austrian School, he considers universal categories that belong more to Classical economics, such as that of reproduction, the division of labour, intensification, and the production of surplus product. Certainly, all of the listed concepts can be used to describe a natural (non-monetary) economy; only when valuations are made can there be real economic calculation. Instead of establishing general principles for valuation and optimality, 'it seems much more practical for theoretical economics to establish for each economic regime a particular economic theory' (*ibid.*, p. 27). By contrast with Eucken's later work, the conceptual reconstruction of various economic systems does not proceed from a general Neoclassical allocation theory, expanded with some additional elements from the theory of imperfect competition or models of various monetary institutions. Instead, Chayanov thinks in terms of closed theories for alternative systems, which in reality, then, can, of course, overlap, as in the case of the rural family economy, central for Chayanov, which contains capitalist elements.

Chayanov rejected communism because he understood and loved the old Russian agricultural sector and wanted to help it make the transition into a new

era. Today we can still observe how farmers in central Europe, sometimes in the mountains, expand and then reduce their workload, according to the needs of the family and the opportunities offered by part-time jobs – combining, for example, cultivation of land and livestock farming with part-time jobs as mountain guides or ski instructors – and how personal living standards determine the extent to which various tasks become options. In Chayanov's (1984) utopian novel, *Reise ins Land der bäuerlichen Utopie* (The Journey of My Brother Alexei to the Land of the Peasant Utopia), the hero of the novel unexpectedly finds himself sent to a future – as in Orwell's book, the year is 1984 – in which the Soviet system has been replaced by a renewed system of peasant farming. The novel was published under a pseudonym, since the perspective it presents would not have been acceptable to the government. To make publication possible, Chayanov wrote an introduction under yet another pseudonym, in which he denounced the work as reactionary and claimed that it had only been printed as a warning, in order to present readers with the dangers of a peasantist orientation.

Just as in William Morris, where the future returns to handicrafts, in Chayanov's future everyone lives for the land, which is cultivated like a garden. Even the cities have assumed a rural character, criss-crossed by garden areas, and primarily serve cultural life among farmer families who meet one another there and so participate in culture at the highest level. Market and performance guide the system, while the state is minimised. Capitalist industry is retained in order to promote technical progress. In other parts of the world, however, people live under other systems; only Germany remains socialist. Humorous irony is woven into the text, making it clear to the reader that the author does not naively confuse his dream – of a connection of the Russian peasant legacy to elements of bourgeois culture and selected achievements of future technology – with reality. The hero, sent from the revolutionary period into an imaginary future, is ultimately unable to adapt to the new world. The new society is foreign to him; it has some of the features of repressive tolerance. We cannot tell whether Chayanov denounces these characteristics because he has a problem with the latest modern developments, whether he wanted to depict a dictatorial element that was particularly socialist, or whether he simply allowed some ambivalence into the work to protect himself from the censors.

It is appropriate to Chayanov's original nature that his reception took different paths. We could look to the relevance of Sahlins (1972), who speaks of a domestic form of production, in which labour is divided by sex, which only employs simple production technology, and which sets limited goals in production. For Sahlins, all three aspects are essential. If there is a deviation from the norm in one of the three relationships, tensions arise which could lead to the collapse of the domestic unit. He therefore formulates what he calls Chayanov's rule: 'The intensity of labour in a system of domestic production for use varies inversely with the relative working capacity of the producing unit' (*ibid.*, p. 91).

In domestic production, maximum performance is not the target; there is no pressure to produce a surplus (such a pressure may, however, come from outside, as in the *obrok* system), but the weakest units are burdened by heavy pressures. As Sahlins's examples from the farthest corners of the world show, the principles

of the peasant family economy are spread far and wide, and everywhere there are marginal situations, such as the widow with three small children to feed. Corresponding to the *Zeitgeist* of the early 1970s, Sahlins naturally emphasized the other, happier side. For him, tradition-bound cultures free from class domination (particularly, hunter-gatherers, but also agricultural populations) stand out, due to their inherent abundance. Since needs can be reduced to a level far below the maximum achievable (in formal terms: the preference for leisure is high), a satisfactory standard of living can be achieved with relatively little stress, so that a great deal of free time is left for play, friendly exchanges, festivals, and religious celebrations. To make the existence of abundance plain, Sahlins describes how hunter-gatherers know how to select their food from among thousands of plants and animals, which they enjoy even if their food would not suit a European palate. As if drunk with wine, Sahlins's hunters and gatherers rave about the delicacies which they find growing wild, and they are not simply idle because they observe rituals (*ibid.*, p. 38).

In his academic works, Chayanov kept such exuberance at bay, but in his novel the village fair, homemade cakes, and family invitations are celebrated as wonderful experiences which have returned to the utopian world, after appearing to have been done away with in the fanatical asceticism of the revolution and the turmoil and suffering of the civil war.

Today, the peasant family economy has become a peripheral entity, which the state supports with changing degrees of willingness, because we would be poorer without it and hilly fields and meadows would become forests. Chayanov did not write for the modern service society, but his work has become a classic analysis of an economic form of existence which has determined our history.

Notes

- 1 On this question, see especially Schumpeter (1926), Brinkmann (1937, pp. 13788), Spiethoff (1938). Regarding more recent literature, see especially Dopfer (1988), Kaufhold (1988), and Backhaus (1993).
- 2 See Schmoller (1883, p. 12).
- 3 See Salley (1988).
- 4 See Schefold (1986, pp. 195ff.).
- 5 See especially Schmoller (1900, pp. 229–324); Schmoller (1904, pp. 652–78); Wrede (1961).
- 6 On this, see v. Below (1926, pp. 501–621); Wrede (1961, pp. 53–63).
- 7 See Schmoller (1904, p. 658).
- 8 See Schefold (1985).
- 9 'Even the most primitive times and societies we can thus not imagine without a sum of typical value equations that are kept at a certain level. These will have formed the point of departure for all barter and sales transactions even in the oldest markets' (Schmoller 1904, p. 109).
- 10 See Barkai (1988) and Hudson (1988); see Schmoller (1904, pp. 60–100).
- 11 See Schmoller (1904, pp. 159–73).
- 12 See also Schmoller (1904, pp. 605–52).
- 13 This connection is, in particular, promoted by the Chicago School, with R. A. Posner being the original spearhead thinker of the economic analysis of law. The theory of

- regulation could also be mentioned in this context. See, for instance, Stigler (1988); the most public expression for the estimation of new Institutionalism was the award of the Nobel Prize to R. W. Fogel and D. C. North in 1993. On this, see Grüske (1995).
- 14 See Hutchinson (1984).
 - 15 See Liebhafsky (1975).
 - 16 See Boulding (1957).
 - 17 As quoted by A. Montaner in his entry on 'Institutionalism' in v. Beckerath and Bente (eds) (1956), *Handwörterbuch der Sozialwissenschaften*.
 - 18 On this connection, see Müller (1994). Müller rightly criticises the mistake of associating the modern Property Rights School exclusively with American Constitutionalism, without mentioning the tradition of the German School of Social Law.
 - 19 See K. W. Nörr, B. Schefold, and F. Tenbruck(eds) (1994), on this.
 - 20 From a pointedly Marxist perspective, see R. Hilton (1978 [1976]).
 - 21 It is no negation of Commons's fundamental idea if we point to the very different character of the emergence of institutions in countries outside of the Anglo-Saxon legal tradition. An excellent source on the origins and codification of commercial law in France is J. Savary; on Savary, see Schefold (1993c).
 - 22 See Voegelin (1928) on this.
 - 23 As the title by G. L. S. Shackle's famous book put it. See Shackle (1967).
 - 24 German edition: Eucken (1940). English edition: Eucken (1992).
 - 25 Cf. 'Knut Wicksell's *Interest and Prices [Geldzins und Güterpreise]*', in the present volume, pp. 325–332
 - 26 For an authoritative retrospective view on the debates by someone who joined them early on, see A. Lowe (1989), '*Konjunkturtheorie in Deutschland in den zwanziger Jahren*', in B. Schefold (ed.), *Studien zur Entwicklung der ökonomischen Theorie VIII = Schriften des Vereins für Socialpolitik*, new series, vol. 115/VIII, Berlin: Duncker & Humblot.
 - 27 Åkerman (1932); see also Åkerman (1933); see Åkerman (1938). All translations from this text are mine.
 - 28 I am indebted to the late Mr G. Eisermann for drawing my attention to this.
 - 29 See Hicks (1969); see Robinson (1979).
 - 30 See the illustration on p. 15 in Åkerman (1938).
 - 31 One may ask whether this judgement is fair in the case of Smith, if one considers the *Theory of Moral Sentiment* and the *Wealth of Nations* in tandem, quite apart from Marx, whom Åkerman, however, also treats separately. See Reich (1991).
 - 32 Thus Eucken, according to Bombach's account of him; see Bombach's (1990), p. 59.
 - 33 Cf. G. Spittler (1987). This informative introduction points out, among other things, the various transcriptions of the name. It includes an overview of the correspondences between the German version of the book from 1923 and the English translation (1966) of the Russian version from 1925, as well as considerations of the history of reception and a brief critique of the work.
 - 34 Cf. Miklachevsky (1898).
 - 35 A German translation of V. K. Dmitriev's essay '*David Ricardos Werttheorie. Versuch einer strengen Analyse*' is included in Dmitriev (1986).



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Knut Wicksell's *Interest and Prices* [*Geldzins und Güterpreise*]

Today *Interest and Prices* ranks among the greatly admired, often-read classics of economics. Worldwide recognition came late, in the wake of discussions of Keynesianism. The book was as stimulating to advocates as to opponents of Keynesian macroeconomics.

A child of the mid-nineteenth century, Knut Wicksell belongs to the generation of Böhm-Bawerk, Pareto, and von Wieser; he was only a little younger than Walras (born in 1834), Jevons (1835), and Menger (1840) (Uhr 1960). While these three began publishing in the early 1870s, Wicksell's major works were only published at the end of the century. Like Pareto, who was three years older, he came to economics late. Even Böhm-Bawerk, born the same year, was a full decade ahead of him. Nevertheless, he was never a mere imitator. We have the maturity of his thinking for the clarification of central questions, which were still controversial among the early Neoclassicists.

The hundredth anniversary of the publication of *Interest and Prices* in 1998 came at a time when not only historians of theory but also theoreticians were focusing on Wicksell. Long essays in important reference books and essay collections (Blaug 1992, Wood 1994), the kind of treatment that few economists enjoy, testify to this.¹ Wicksell (1988 [1896]) wrote a revolutionary work on taxation.² His theoretical examination of capital still plays a role in current discussions (he preferred Böhm-Bawerk's line of argument to that of Marshall or Walras). However, it is certainly the presentation of the cumulative process in *Interest and Prices* which created the greatest furor, even if the ideas that were associated with it had to be rediscovered by others and were modified for use in the analysis of employment and economic cycles, particularly in the hands of Keynes and Hayek.

For authors writing in the German language, it is a poignant memory that Wicksell wrote in German in order to reach an international audience. But German, as an international medium for educated people, never attained the importance which Latin had enjoyed for centuries, that French later had, and which today English has. Writing in German did not help Wicksell achieve his goal, because, as Bertil Ohlin wrote in his obituary of Wicksell in the *Economic Journal* in 1926, authors such as Hawtrey and Keynes did not know about his book: ' . . . what shall we say of the surprises felt in many quarters that a very full

and comprehensive analysis has remained practically unknown among writers on monetary problems in Great Britain, only because it happened to be published in German?' (Ohlin 1926, p. 507). Ohlin mentions Wicksell's attempt to make his monetary theory known in England in 1906, but the essay did not adequately represent Wicksell's ideas, since his English language skills were not equal to his German.

German language literature – with the important exception of Mises (*Theorie des Geldes und der Umlaufsmittel* [Theory of Money and Means of Circulation], 1912) – only took note of Wicksell's monetary theory ideas after the First World War, although then the reception was very positive (Sommarin 1931, p. 261). When controversy developed, following the publication of the *General Theory*, regarding the degree to which the theory of employment had been anticipated by the Stockholm School, Wicksell was referred to as a forerunner and founder:

Among the circumstances which explain the present trend of theoretical analysis in Swedish economics one should, I think, first mention the writings of Wicksell, which naturally attracted more attention in Sweden than elsewhere. His *Geldzins und Güterpreise* of 1898 and his later books and papers on money contained the embryo of a 'theory of output as a whole' although this fact was not clearly perceived till the late twenties, when Professor Lindahl presented his elaboration of Wicksell.

(Ohlin 1937, p. 53)

Shortly before that, an English translation by R. F. Kahn, entitled *Interest and Prices*, had been published (Wicksell 1965 [1936]), with an introduction by Ohlin. A reviewer made the following prediction about the outcome: 'As it is, Wicksell's work will now be studied from the viewpoint of the history of economic thought, for his ideas had already reached us indirectly or have been painfully re-discovered' (Walker 1994 [1936], pp. 56–7).

Wicksell's works were therefore praised but did not have much direct impact on the nature of the discussion. At first, he was barely accepted and little understood; then his ideas were treated as if they were already common property.³ At the end of a review which appeared in the year of publication, the reviewer asks if it would not be better to examine whether, as the monometallists claim, falling prices are an advantage or, as the bimetallicists argue, rising prices are an advantage: 'Dr. Wicksell appears to wish to keep prices steady, and is, therefore, to be counted as a man of singular moderation' (*ibid.*, p. 386). Trapped by a discussion which was a creature of its time, the reviewer overlooked the novelty of the work and was surprised at an assessment that is today conventional. Wicksell could not, or at least for a long time could not, feel that he had been understood. The history of the reception was, as is frequently the case in economics, complicated.

There is hardly any other economist who possessed Wicksell's talent for developing his ideas from a historical-theoretical context. He appears to have read Ricardo again and again, and *Interest and Prices*, his most original work, connects

directly to the monetary controversy which developed from the argument over Ricardo's formulation of the quantity theory. Wicksell also had a deep understanding even for his theoretical opponents, Marx included. *Interest and Prices* is enlivened by the confrontation with Tooke, who turned the quantity theory on its head: at a particular price level, the money supply must adapt to fluctuations in monetary demand; the price level itself is dependent on costs and rises or falls according to the long-term rise or fall of the interest rate. In his explanation of marginal productivity theory, Wicksell referred to von Thünen, in capital theory he followed Böhm-Bawerk, and in his notion of a general equilibrium, Walras.⁴ He sought to mediate between these theorists and Marshall, as Neoclassicism progressively divided into schools.

To the Swedish public, however, Wicksell did not appear to be an indifferent theorist and educator, but rather a person driven by conscience and an agitator possessed of radical ideas. In 1851, he was born into a large middle-class family. He endured years of brooding religious questioning under the influence of a Lutheran pastor until, following a personal crisis in 1874, he finally became a free-thinker. At first he made quick progress in his studies of mathematics, Latin philology, Scandinavian languages, and philosophy. But he then turned to student politics and spoke out on various subjects – for example, against alcoholism and for restrictions on population growth. Exploring Malthusian philosophy led him finally from a study of natural sciences, which he completed quite late – in 1885 – with an advanced degree, to the study of economics in England, France, Germany, and Austria. In 1890, he returned to Sweden and finally earned his doctorate in 1895 with a work that led to his 1896 book, *Finanztheoretische Untersuchungen* [Studies in the Theory of Public Finance]. Before that, in 1893, *Wert, Kapital und Rente* [Value, Capital, and Rent] had been published, and, following another period of study in Berlin, *Interest and Prices* appeared in 1898. These were the principal works which would be further developed in his later seminars when, now married, he was finally made a professor. His wedding almost did not take place, due to his aversion to social conventions; his academic promotion almost failed, due to his republican, anti-monarchical beliefs; and even later his fidelity to his principles – some would say his obduracy – would cause him difficulties.

He had considerable influence as a professor in Lund (from 1904 until 1916), as professor emeritus in Stockholm, as advisor, and as the author of numerous essays in newspapers and journals. Not only were his theoretical conceptions characterized by a wealth of ideas, originality, and strong individualism, but also by his economic thinking.⁵ For example, after the First World War, he, first of all, advocated a return to pre-war prices for the sake of justice and, to this end, suggested a programme of measures that was ahead of its time. As the high cost of such a radical deflation policy became evident, he limited the aims and the measures to an anti-inflation programme that should result in the stabilization of employment.

Wicksell, so clear in his analysis and so certain of his judgment, saw economics as a means of increasing the general prosperity of all; the knowledge necessary for this task appeared to be at his fingertips:

But if, as I hope and believe, one day we recognise that our goal here on earth is to extend the greatest possible happiness to all, of whatever class of society, race, sex, language, or faith they may be – then the pleasant discovery will be made that the economic side of this problem has already been solved in its essentials, and that the solution only awaits practical application.

(Wicksell 1958 [1904], p. 66)

Speaking these words in his inaugural lecture in Lund on 16 September 1904, Wicksell expressed his generation's belief in progress. He was, however, no friend of Schmoller, who likewise shared this belief in progress (Schefold 1997d). While Wicksell recognized the achievements of the Historical School in the fields of statistics and economic history and, moreover, expressed sympathy with individual members – he admitted to having listened to Knapp with delight – he complained bitterly of their anti-theoretical attitude, which he must certainly have noticed during his stay in Germany:

But because of its one-sidedness and the purely negative, harshly deprecatory, even conceited and offensive attitude which it always adopts towards contemporary research of the theorising and systematising sort, this school has, in my opinion, hindered and damaged the development of economics, especially in Germany; . . .

(Wicksell 1958 [1904], p. 57)

In fact, Wicksell saw progress in economics in England, America, Italy, and Austria – everywhere, that is, except in Germany – and he denounced what he viewed as dangerous political consequences or related developments, such as the tariff policy or, directed at Schmoller personally, discrimination against the Polish in Prussia (*ibid.*, p. 55). The Historical School did not consist solely of whole-hearted supporters of Wilhelmian policy, and even Schmoller had other sides than those pointed out by Wicksell, but later events would turn out to justify the emphatic warnings that had been made.

Wicksell's model of cumulative processes was neither completely new nor a complete anticipation of Keynesian macroeconomics, as we know it today. He cites Thornton and Joplin as predecessors (Humphrey 1994 [1986]). Wicksell remains separated from Keynesian macroeconomics because of the general lack of an analysis of unemployment in *Interest and Prices*, though in other texts he explores the topic (though with a different approach). In *Interest and Prices*, money interest rates which are too high (above the natural interest rate) lead to falling prices and money wages, without any necessary reduction of employment. In essays on economic cycles before the First World War, he discussed recommendations for the stimulation of demand through cheap credit. He also explored technological underemployment and repeatedly returned to the question of population policy. These various ideas were not, as is the case with Keynes, integrated into monetary theory (Jonung 1994 [1989]).

Ricardo's quantity theory represents the starting point: when the money supply increases, prices increase, and interest falls; the fall in interest rates, however,

lasts only until prices have risen sufficiently so that the increased holding of money once again corresponds to the inflated need for transaction funds. The natural rate of interest provides the standard for an interest rate, which makes a stable price level possible and is equivalent to the profit rate of the Classical economists, Wicksell turning to Böhm-Bawerk's theory for support here. It turns out that deflation and inflation can grow without limit and accelerate if the cause – the discrepancy between the natural interest rate and the money interest rate – is not eliminated. When these interest rates coincide, the process of price changes halts; the price level remains exactly where it is at that particular moment.

Wicksell thus separates the theory of the price level from the theory of relative prices. The equilibrium of relative prices is stable, while the equilibrium of the price level, when the natural and money interest rates coincide, is a matter of indifference. This theory, so shocking at the time, assumes that monetary value cannot be explained by a relative price, specifically the relationship between the production costs for a coin or a banknote and the production costs of goods. Wicksell questions the regulation of price levels through the requirements of precious metals (except perhaps in the vicinity of the mines or in the very long term). He writes as an author in a transitional period, when local inflation, which was induced by new discoveries of gold, such as those in California, were still a vivid memory or were still happening, as in Alaska. However, a close relationship between the production costs of commodity money and its purchasing power had already appeared empirically questionable to Senior, the primary champion of the production cost theory of money, as soon it went beyond local borders, and an international connection was observed. Wicksell (1965 [1936], pp. 35 and 43) is quite right to name Marx as the only later prominent representative of this view.

Even if production costs determined money value only by means of weak functional chains, the scarcity of precious metals circulating as a whole functions, as Schumpeter (1927) describes it, as 'the golden brake on the credit machine' – only the complete elimination of the connection between paper and bank money and precious metals made the massive inflations of the twentieth century possible.

The critique of the cost of production theory of money is therefore carried out with great reservation; this is analogous to the circumspection with which Wicksell takes up and criticizes Tooke's objections to the quantity theory.

Wicksell's presentation of payment transactions in a country only tied to gold through foreign trade and which domestically arranges all payments through credit relationships and account transactions makes clear the excitement and the novelty of this institution. Wicksell (1965 [1936], p. 79) does not deny the influence of foreign trade on the price level, but he believes that interest policy is the determining factor. He devotes much attention to the question of how the circulation of banknotes could be increased. It is more an anticipation of Keynes than of Friedman when he writes,

In other words, the real cause of the rise in prices is to be found, not in the expansion of the note issue as such, but in the provision by the Bank of easier credit, which is itself the cause of the expansion.

(*Ibid.*, p. 87)

He also addresses what we would call today an ‘interest-elastic investment function’. What happens if an increase in monetary demand is induced by a reduction of the interest rate? Can production be increased or does it encounter limits – as Wicksell puts it: Are ‘... the available means of production, labour and so on, already more or less fully employed?’ (ibid., p. 90).

Prices rise only in the latter case (Wicksell takes only a brief look at the first possibility). Clear influence of the reduction in the rate of interest is felt, first of all, in the process of revaluing durable capital goods, of land, and so forth, whose rental income yield can be discounted with respect to the rate of interest. It is the problem of two price levels of the post-Keynesians: according to them, a reduction in the rate of interest leads to an apparent increase in investment if only the prices of durable capital goods and of land increase, without there being any investment in new capital goods and an associated increase in employment. For Wicksell, price increases of durable means of production induced by an increase come to a halt together with those of the produced goods if the easing of credit ceases – assuming that speculation does not get out of hand, pushing the bull market too far and leading to a collapse.

Wicksell repeatedly comes back to Tooke and to the question of whether permanent interest rate changes are not changes in production costs, and thus a lowering of interest rates would lead to a lowering of prices and higher real wages. In the framework of marginal productivity theory, the real wage is determined. In Classical Theory, as it existed in Tooke’s time, it was also thought possible to influence distribution by a monetary interest rate. Even for Wicksell, there can be a simultaneous fall in prices and the money interest rate, when the natural interest rate has fallen even further. The phenomenon observed by Tooke, coordinated changes in money interest rates and prices, thus has a place in Wicksell’s theory – but in connection with hypotheses about the course of the natural interest rate, which are difficult to verify. This rate must first have fallen for reasons which are not clearly explained, so that prices fall *despite* the falling money interest rate, while for Tooke the real interest rate falls *because* of the falling money interest rate. In order to avoid confusion, Wicksell suggests to set aside

... variations in real capital, which only complicate the argument, and to concentrate on changes in the money or credit markets, assuming that the situation in the commodity market remains unaltered. It will then be possible later on to combine the two forces, and this in fact is the line of treatment which we shall pursue.

(Ibid., p. 109)

Wicksell assumes the soundness of creditors, so that the cumulative process proceeds with the assumed regularity. In a further development, the model is even more rigorously structured. A stationary state with annual markets and advanced wages is assumed. Entrepreneurs function as bank debtors so that with natural and monetary interest rates at the same level, prices are just sufficient to pay back advances with interest. It is possible to calculate in detail with hypothetical numerical cases how a discrepancy between the two interest rates finally leads to a tendential expansion

or contraction of business – tendencies which, when the real economic process is assumed to be stationary, must be reflected in price changes. Wicksell does not fail to notice that the assumption, above all with falling prices, simply cannot be accepted as plausible; he formulates it somewhat awkwardly: ‘It is not, however, to be denied that there may be a more or less permanent, though not progressive, loss of employment by some of the workers – the industrial reserve’ (ibid., p. 149).

In so doing, Wicksell, who repeatedly returned to the question, is quite right to insist that a depressed state of the economy should generally be seen as a cause, rather than an effect, of a decline in prices (ibid., p. 194 sq.).

As when reading other great classics of economics, the reader of Wicksell alternates between the illusion of knowing better because of subsequent theoretical advances and the shameful recognition that the clarity of explanation and the originality of his ideas still prompts new ideas and extensions. Do we want to follow him, for example, when he compares the two extremes of an economy based on metal money and an economy based on the exchange of pure credit money and then suggests. ‘The monetary systems actually employed in various countries can then be regarded as *combinations* of these two extreme types’ (ibid., p. 70)?

Or does an economy which is based on a combination of these extreme situations have its own laws? Do we have an answer today?

How theorists can vacillate when interpreting Wicksell can be seen in an example from Keynes, who wrote in 1931:

I incline to believe that during the period of the economic construction of the modern world we have enjoyed, generally speaking, a market rate if anything *below* the natural rate, and this has been a necessary condition of the accumulation of wealth. On the other hand, during the greater part of recorded history market rates have been, as at present, *above* the natural rate. During such periods, which have lasted for as much as 500 years at a time, economic progress and the accumulation of wealth have stood still or receded.

(Keynes 1981, p. 273)

Hence, we should have seen in the discrepancy between the two interest rates the very key to the economic history of the world. In his *General Theory* of 1936, Keynes abandoned the ‘most promising idea’ (Keynes 1973 [1936], p. 243) of a natural rate of interest; it is only the interest rate which keeps the present state stable – in Wicksell, the price level in a stationary state – and one could at most talk of a ‘neutral interest rate. Thus, he suggested calling the interest rate which, *ceteris paribus*, corresponded with full employment the ‘neutral rate of interest’; this neutral interest rate was also the optimum.

Harrod (1969, pp. 173–84) later and somewhat confusingly attempted to rehabilitate the natural interest rate by labelling as ‘natural’ Keynes’s neutral interest rate, which is not connected with the status quo. Referring to the definition of the natural rate of interest, he lamented the transition from Keynes’s *Treatise on General Theory* as a step backward, while Joan Robinson, in contrast, distanced herself from the full employment interest rate.⁶

Other significant debates have formed around individual terms associated with issues which were of major importance to Wicksell.⁷ A particularly recent one is Wicksell's insight that the entire money supply becomes endogenous when all transactions are based on credit relationships. Who knows what the future will discover in Wicksell . . .

Heinrich von Stackelberg's concept of equilibrium: the search for evolutionarily stable market behaviour

The years between 1925 and 1940, among the most productive in the history of economic theory, saw the development of the theories of imperfect competition and of effective demand, as well as the early analysis of activity and growth (Leontief, von Neumann) and initial considerations of game theory. These theories all had antecedents, some of which went as far back as the works of Cournot and Malthus. It was therefore possible to treat such theoretical developments in terms of a gradual accumulation of individual analytical insights. However, from the standpoint of the new theory of imperfect competition introduced by Sraffa, Chamberlin, and Robinson, coupled with Keynes's dismantling of the idea that full employment was self-sustaining, many have treated this period as a scientific revolution that shattered the forty years of tranquil dominance by a Neoclassical system inaugurated in 1870.

Such contrasting interpretations become comprehensible if we recall the economic, political, and intellectual upheavals of interwar years. The theory of imperfect competition was attractive because it seemed to explain a change in the market's power structure, while Keynesianism promised an answer to a totalitarian challenge. With the benefit of historical distance, we can more critically appreciate the claims made by the self-proclaimed leaders of a scientific revolution than their contemporaries could.

While the significance of analytical progress is often eventually moderated, there was indeed such progress during this period. The interpretation of the connections between theoretical innovation, shifting economic policy, and general political ideas becomes the task of the historian of economics; he cannot simply list and register formal innovations.

Heinrich von Stackelberg's *Marktform und Gleichgewicht* [Market Form and Equilibrium] (1934) represents an analytical advance in the treatment of the existence and stability of equilibria in oligopolistic markets and their interaction – an achievement that has gained worldwide recognition.⁸ The basic idea has been included in most microeconomics textbooks and, coupled with game theory, is also of importance for industrial economics.⁹ Stackelberg embedded his discovery in a vision of declining competition, creating problems of market stability which the Fascist corporate state would moderate. The claim that such a historical tendency exists is, however, unrelated to the political solution favoured by Stackelberg. Following on from Marx, both Schumpeter and Sombart presented similar concepts. Even in the United States, New Deal advocates viewed the 'decline of competition' as irreversible (Niehans 1992, p. 196).

Though it is only thanks to *Marktform und Gleichgewicht* that Stackelberg has remained at least a name in international debate, in his short life he gained such influence in Germany through his textbook, his essays on capital theory, and a number of other texts that much was expected of him. According to Heuß (1989, p. 70), German economics might possibly have taken a different path in the 1950s and 1960s had he been spared an early death. If it is surprising that a believer in positive science, an exponent of formal economic theory, and an advocate of Neoclassical conceptions should have distinguished himself during the National Socialism era, both as an economist and a National Socialist, and if amalgamation of National Socialist ideology and science would usually be attributed to members of the Historical School, it should be remembered that during the 1930s, those who wished to take part in public economic debate had to choose between adaptation and dissociation. Consequently, important and independent-minded figures in the Historical School soon found it necessary to distance themselves from the Nazis, while someone like Stackelberg was, to a certain extent, working both levels quite separately. Committed to pure theory in a rigorous science, he was captivated by the national idea and sought pragmatically to use the party for his own ends, an approach which, of course, ultimately proved illusory.

Eucken (1948) emphasized in Stackelberg's obituary that he sought to elaborate the economic significance of his formal investigations and so ended up as a decided critic of any form of planned economy.¹⁰ In the GDR in 1965, it was claimed that Stackelberg 'presented a suitably-modified politico-economic doctrine to the German monopolistic bourgeoisie, which in the course of the Second World War was heading for political and economic bankruptcy.' The same book confirms that the party had recognized the distance between Stackelberg's political orientation and his scientific activities (Möller 1965, pp. 5 and 35). The tension between theoretical knowledge and political conclusions had already been noted by reviewers of *Marktform und Gleichgewicht*. Hicks (1935) was critical, but Oskar Lange (1935) drew an entirely different conclusion, that the solution was to 'transfer large capitalistic monopolies into public ownership'. Kaldor (1936), by contrast, indicated the direction that future theoretical development would have to take if the set of problems exposed by Stackelberg were to be overcome.

Heinrich von Stackelberg was born on 31 October 1905 near Moscow and was of German-Baltic descent on his paternal side, while his mother was an Argentinean of Spanish descent. Following the revolution, the family at first fled to Silesia and later settled in Cologne. Stackelberg studied economics and mathematics in Cologne, receiving his doctorate in 1930 and his university lecturing qualification (*Habilitation*) five years later. His dissertation, *Die Grundlagen einer reinen Kostentheorie* [Foundations of Pure Cost Theory], attracted international attention. Following a period of study in Italy, he produced essays on imperfect competition which, under Amoroso's influence, helped prepare the way for *Marktform und Gleichgewicht*. Stackelberg became an assistant professor and then an associate professor in Berlin and finally a full professor in Bonn in 1941. In his works, he gradually opened up the important areas of economic theory. During the

war, he worked on capital theory and on his textbook, although at times serving as a soldier. In 1943, he accepted an invitation to be a guest professor in Madrid, where, among other things, he wrote the expanded version of his textbook.¹¹

As a whole, Stackelberg's writings impress through the breadth of analysis he developed in his few years as a researcher, for the depth and thoroughness of analysis in individual essays, and for the acuity and precision with which, in short texts, as well as reviews, he revealed critical mistakes.¹² Some reviews even turned into lists of errors – which did not prevent him, however, from giving praise whenever he found occasion. But only his principal work has become a classic which readers return to again and again, for its stimulating ideas, which still inspire, and because the complexity of these ideas continues to prompt new interpretation.

In England, the impetus for the development of a theory of imperfect competition originated in Piero Sraffa's attack on Marshallian microeconomics. In its first and perhaps more significant form, that of 1925, this attack consisted of an internal critique of the laws of return, while Sraffa's better-known second essay, from 1926, only briefly dealt with the internal logic of Marshall's ideas, pointing out the incompatibility of increasing returns and perfect competition, before moving on to sketch out a theory of monopolistic competition. The debate which followed in the *Economic Journal* undermined the prevailing certainty that Marshallian theory could be used in a logically consistent manner in a world characterised by declining costs.¹³

A solution was sought in the development of the Cournot monopoly solution, complemented with the marginal revenue curve. Today it could be objected to the determination of monopoly profit that even the monopolist, facing a particular level of demand, will not set a price that goes beyond average cost price in a contested market. Similarly, 'lazy' monopolists were talked of even before Baumol; these monopolists, fearing latent private competition, the anger of consumers, or state intervention, did not dare to reduce supply so far that price elasticity exceeded unity and marginal revenues equalled the level of marginal costs. Joan Robinson (1979 [1969, 1933]), however, transferred the traditional theory of monopoly into monopolistic competition when, following one of Sraffa's suggestions, she assumed a divided market, in which the product is heterogeneous with regard to seller and location but is otherwise homogeneous.

Robinson later acknowledged that Edward Chamberlin, who had independently developed the same line of thought, was in one respect more thought-provoking: he considered the conditions under which companies are able to create a monopoly which they do not initially possess by differentiating their products and influencing demand through advertising. Robinson did not really address the oligopoly problem. She also later called her book 'scholastic' (Robinson 1953, p. 579) and wrote,

The reason 'oligopoly' is neglected in the 'economics of imperfect competition' is not that I thought it unimportant, but that I could not solve it. I tried to fence it off by means of what unfortunately was a fudge in the definition of the individual demand curve.

(Ibid., p. 584)

The “fudge” lay in the fact that a single demand curve cannot take account of the interdependence of markets, an issue that cannot be neglected, even in the case of connected monopolies. In her self-criticism, Robinson does not refer to this point, which would become central for Stackelberg. Rather, she believed the individual demand curve to be problematic even under conditions of partial equilibrium, where a monopolist faces competing customers. She sought to break away from the static analysis of imperfect competition and connect it to the theory of effective demand, which, in Kalecki’s model, fluctuated according to the influence of macroeconomic parameters (Robinson 1979 [1969, 1933], Preface to the Second Edition, pp. VI–VII).

Another development in the theory of imperfect competition in dynamic form was the creation of the term ‘workable competition,’ by Clark (1940), who asked which market form best serves the development of productivity. However, quite independently of the work of Robinson and Chamberlin, Stackelberg had already submitted his second dissertation (*Habilitationsschrift*) to the economics and social sciences faculty in Cologne in the summer semester of 1933. The resulting book was able to deal with Robinson’s ideas because it was first published in 1934, after the text had completed its course through the *Habilitation* procedure.¹⁴

The special nature of Stackelberg’s book derived from the fact that he put price determination in an oligopoly, which had been neglected by Robinson, at the centre of his exploration and at the same time analysed the impact of imperfect competition on connected markets. He therefore travelled a good part of the way from partial to general analysis. He had reviewed the books by Chamberlin and Robinson jointly, giving the former preference because of its greater precision, while still approving the latter for its treatment of price differentiation. But he saw the ‘solution to the great new task’ differently than Chamberlin and Robinson did:

In duopolies and oligopolies there is no automatic equilibrium. This therefore immediately excludes the notion of an autonomous economic system from the theory of limited competition, which is the sole realistic theory. Here an economic system is only possible through deliberate economic intervention; it therefore involves the domain of the political. For that reason, an extension of the investigation initiated by Chamberlin and Robinson can only be conducted on the basis of a political theory of the economy.

(Stackelberg 1935, p. 708 sq., [p. 376], my transl.)

In no economic theory are all variables endogenously determined. Stackelberg thought his own contribution original because he wanted to subordinate a variable usually thought to be endogenously determined, equilibrium price, to exogenous determination by political intervention. By contrast, modern economists seek to endogenize political factors as well, if at all possible. That the economic process functions ‘autonomously,’ that it arises from cultural connections, and that the economy does not serve needs but reorganizes them were frequent topics of discussion in the Twenties (Schefold 1992b). Stackelberg went beyond such cultural

critiques by attempting to prove that a certain degree of breakdown of autonomy was inevitable. He suggested the following, more precise explanation of stability:

The price formation of a particular market form is stable when it displays the following characteristics:

- a If this form of price determination is given, and presents unrestricted freedom of price formation for any economic individual, it does not alter the behaviour of this individual.
- b Any individual's behaviour does not have the goal of changing the real form of price determination.

If there is no stable equilibrium, then either the method of price determination or the market form must be changed in some way or another.

(Stackelberg 1934, p. 12 [p. 204])

Stackelberg's definition of stability appears unclear (Niehans 1992, p. 194); a constructive solution is to interpret it through the lens of modern theory, so that we might establish which elements of Stackelberg's work might still be considered valid today. But to come closer historically to his intentions, we must start with the formulation as given. The market form represents the primary datum. The first part of the definition appears to suggest that a particular form of price determination can be defined by an existing strategy – for example, rooted in traditional, habitual behaviour, something disregarded by most Modern approaches. The strategy first presented is considered stable, if with respect to other, perhaps newly discovered strategies, the first strategy is retained. The first part of the definition is thus close to the idea of Nash Equilibrium.

The second part of the definition focuses on a behavioural interpretation. With regard to duopolies, Stackelberg differentiates between the independent position of a market leader and the dependent position of a second supplier whose actions are determined by the market leader. The close connection between the market leadership of the one and the dependence of the other ensures stability. However, when the dependent agent alters his activities and both struggle for market leadership, then a new price arises as a result of the ensuing supply, which may signal a new equilibrium, to the extent that both intend to maintain the amounts supplied. To the degree, however, that both struggle for market leadership, which cannot be shared, there is no equilibrium. Whether an equilibrium remains in existence depends not only on the quantity supplied, but also on to what purpose the goods are put – for example, how the expected reactions from other participants in the market are dealt with. Stackelberg suggests that an oligopoly lacks equilibrium because market participants, times and again, find good reasons to change their behaviour.

Exaggerating somewhat and translating this into the terms of game theory, it could be said that Stackelberg at first calls for stability in the narrower sense, as stability of a particular game in which not only the market form, but also the strategic variables and sequencing of moves are defined. A stable equilibrium

in a broader sense, however, exists for him if no participant sees an opportunity to change the rules of play (e.g. ‘mode of behaviour’) which are not already defined by the market form and profit maximization – thus, for example, the sequence of moves. According to this understanding, no stable equilibrium (in a broader sense) exists if the market form does not determine whether the price or the quantity is the strategic variable – or who ‘moves’ first if stable equilibria (in a narrower sense) exist, according to the preconditions of the strategic variables and the sequence, but are different, and when in each of these equilibria incentives exist to switch into another. Perfect competition would allow the supplier only the option of changing the quantity. In a monopoly, the Cournot solution sets the profit maximizing price, as well as the quantity. In an oligopoly, various solutions arise, depending on how specifically the conditions of the game are defined, hence – according to Stackelberg’s certainly too-rigorous demand – none, i.e. none in his sense of a stable equilibrium.

We will explain Stackelberg’s problem more precisely by using the model of a duopoly. Whether the position of market leader or of dependence is more favourable for each supplier depends on the particular shape of the sales and cost curves of the duopolists. For the sake of simplicity, we will assume that market leadership promises greater profit than dependence. If each supplier then seeks to maximise, profit dependence will be unsatisfactory; however, both cannot be simultaneously independent, because this is logically excluded and because this would give rise to such a large supply; profits would be lower than if both were content with dependence. When, finally, both come together so that each of them profits from the monopoly, they need a rule for dividing this profit, which, as Stackelberg emphasizes, is not generated by the problem, i.e. the market form as such.

This is the dilemma Stackelberg uncovered in its most general form, presented as a duopoly. This dilemma is overcome when there are fewer assumptions about behaviour, and strategies are therefore not so loosely formulated. There is less specificity about initial conditions that, for example, determine which of the duopolists first makes a decision, so that an externally given procedure determines who can claim market leadership. If the other challenges this leadership, it not only injures the leader but itself as well. The final determination of such a sequence would certainly have contradicted Stackelberg’s ideas about the conditions of static analysis (Stackelberg 1934, p. 5 [p. 197]).

The Stackelbergian duopoly will be explained in the following example, which has been simplified as much as possible. Two producers, A and B, produce volumes q_A and q_B of a homogeneous good, with proportional cost functions $K_A = q_A$ and $K_B = q_B$. Unit price p follows from selling in the market for the good, with the linear inverse demand-function

$$p = -(q_A + q_B) + 2, \tag{1}$$

so that profit g_A for firm A can be represented as the difference between the revenues and the costs:

$$g_A = q_A p - K_A = -q_A^2 - q_A q_B + q_A. \tag{2}$$

For each fixed profit g_A , curves of equal profits result (iso-profit curves):

$$q_B = 1 - q_A - \frac{g_A}{q_A}. \quad (3)$$

The derivative of (2), set to zero, results in the maximum profit for A, given the production of B; this is the reaction function of A:

$$q_B = 1 - 2q_A. \quad (4)$$

Corresponding iso-profit curves and a reaction function are calculated for B or result, in our case, as a mirror-image symmetric to the 45° axis. The Cournot solution lies in the point of intersection of the two reaction functions: each duopolist takes the quantity produced by the other as a given and obtains, with this quantity, the greatest possible profit. The Stackelberg solution for duopolist A is found by seeking the iso-profit curve for A which is tangential to the reaction function for B; in the tangential point, B acts as the dependent party. Profit is highest there for B, given A's production. A, however, seeks greater profit than in the Cournot equilibrium, because A gets the maximum possible profit here, given the *behaviour* of B.

The Stackelberg point for B again is found through the mirroring at the 45° axis. At the Bowley point, each duopolist supplies the quantity which corresponds to its Stackelberg solution; in our case, the production yields no profit to either party.

When A alone behaves as a monopolist and the production from B is thus zero, a production volume is obtained which corresponds to the Cournot monopoly by setting the derivative of (2) equal to zero, with $q_B = 0$; A's production volume is then $1/2$. Since, in our example, both firms have access to the same technology, the monopoly solution can be represented in both open and implicit interaction of the two through all quantities supplied, such that $q_A + q_B = 1/2$. Everywhere on this straight line, which I would like to term 'the monopoly line', the highest possible total profit is achieved. As can be quickly seen, it is simultaneously – borrowing a term familiar from the Edgeworth Box – the 'contract curve', where the iso-profit curves for both duopolists are tangential to each other. With other cost functions, the monopoly profit is reached at only one point on the contract curve.

In the following table, the total production volume, the quantities produced by the individual duopolists, their profits, and the total profit are represented, in the four equilibrium conditions – the Cournot, the Stackelberg, the Bowley, and the monopoly case:

It can be seen here that from a macroeconomic point of view, the Stackelberg equilibrium is preferable to the Cournot equilibrium. From the viewpoint of the duopolists, a situation results which is analogous to a prisoner's dilemma: monopoly profit, as well as the Stackelberg equilibrium, yield more in a position of independence than the Cournot equilibrium, but when both attempt to achieve the production volume of $1/2$, profits diminish. Therefore, equilibria which are stable in the narrower sense are not at the same time stable in the broader sense.

Table 5.1 Table of duopoly equilibrium

	q	q_A	q_B	g_A	g_B	g
Cournot	$\frac{2}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{2}{9}$
Stackelberg (A)	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{3}{16}$
Stackelberg (B)	$\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$
Bowley	1	$\frac{1}{2}$	$\frac{1}{2}$	0	0	0
Monopoly	$\frac{1}{2}$					$\frac{1}{4}$

The monopoly ray shrinks to a point if both companies enjoy access to the same technology and produce in an environment characterized by increasing costs. However, it seems very likely that we can impute falling costs to duopolies, because without barriers to entry, there would be competition. Furthermore, it is also possible to assume, as in Stackelberg’s own example, that the monopoly solution with unequal access to technology lies on an axis, we can say that of A. If the duopolists had previously produced at another point – for example, in a Cournot equilibrium – then all Pareto improvements without side payments lie on the section of the contract curve which is bounded by the two iso-profit curves running through the Cournot point. Theoretically, a further Pareto improvement would then be possible, if the production was moved to the monopoly point and A made a side payment to B, which lead to a profit for B that was not smaller than on the section of the contract curve mentioned previously.¹⁵

We will now return to Stackelberg’s own argument. It impresses through the intensity with which stable equilibrium solutions are sought – unstable equilibria are meaningless economically, he therefore speaks of ‘a lack of equilibrium.’ For him, the duopoly is paradigmatic for problems which arise in bilateral monopolies and in the relationship between markets, with which he deals by introducing complex distinguishing cases. ‘Relationships between market forms lacking equilibrium can weaken the barriers which stand in the way of an equilibrium’(Stackelberg 1934, p. 42 [p. 234]). This is because market connections function like an intensification of the relationship between competitors. Conversely, relationships between monopolistic markets, each of which would establish an equilibrium, could ‘abolish’ the equilibrium (ibid., p. 42 [p. 234]), because a situation comparable to a duopoly or a bilateral monopoly emerges. Stackelberg provides a numerical example (ibid., p. 62 [p. 254]) for the duopoly in which the Cournot duopoly point is stable, given the characteristic behavioural hypothesis that every supplier takes for granted the supply quantity of the other. However, in the same example, the position of independence is linked to a higher profit and, to the extent that this is sought after, the Cournot

equilibrium once again lacks stability. Stackelberg could have avoided confusion if he had given the various forms of stability different names. By repeatedly assuming another possible behaviour, he allows the solution again and again to jump to another point and finally tends toward the acceptance of an agreement: 'Rather than entering a struggle which can only end with the destruction of one of the suppliers, the two businesses could also reach an agreement and establish a monopoly together' (ibid., p. 67 [p. 259]). Since Stackelberg chose his example so that the profit from a monopoly would be highest with the closure of a business, he practically eliminated silent collusion. In 1929, Chamberlin had pointed out the possibility of a tacit agreement in a duopoly (Chamberlin 1929, p. 83).

At the end of the book, Stackelberg himself suggests a thought experiment in which two firms regularly alternate being active in a certain market, from which an asymmetrical duopoly solution emerges. In game theory, this approach corresponds to the stipulation of a sequence of moves. To illustrate this, we can imagine that, one after another, two suppliers acquire a certain capacity. The first to make a move seeks, given the production capacity that it has gained, to limit the production possibilities of the second, which are themselves targeted on the assumptions of the first, given an inverse demand-function assumed by both. Since capacity cannot be immediately reduced, there is an irreversibility which guarantees that the Stackelberg solution will occur (Tirole 1990, pp. 315–17). By defining the capacities and the order of moves, the duopoly model is sharpened and rendered more precise, leading to a clear solution. The solution is a subgame perfect equilibrium, to the extent that the best possibility is chosen under the given conditions not only for the game as a whole, but also for each subgame (move). However, the fixed sequence of decisions is no sooner introduced by Stackelberg than it is hastily abandoned, and he returns to his conclusion that the market lacks equilibrium.

In the sixth chapter of his book, Stackelberg outlined an interesting historical summary of his problem.¹⁶ Cournot, as is well known, assumed that each oligopolist – in his example, they are the owners of two mineral water springs of equal quality – maximizes profit at the quantity supplied by the other. Since Cournot initially abstracts from costs, the condition for maximization is simple (Cournot's formula in our notation):

$$\frac{d[q_A f(q_A + q_B)]}{dq_A} = 0$$

for the first duopolist, where f stands for the demand function. Cournot was well aware that there were other plausible forms of behaviour when he wrote that each seeks his own profit, '*car s'ils s'entendaient pour obtenir le plus grand revenu, les résultats seraient tout autres, et ne différeraient pas, pour les consommateurs, de ceux qu'on a obtenus en traitant du monopole*' (Cournot 1991 [1838], p. 89).¹⁷ Cournot therefore already suggests that strategic interaction allows for collusion. 'However, the behaviour that Cournot attributes to every supplier does not follow

from the problem,' states Stackelberg (1934, p. 68 [p. 260]), because his problem is whether the market form permits, under all economically realistic behavioural possibilities, the selection of a unique and stable static equilibrium.

Faced with such a restrictive criterion, Bertrand's solution is also insufficient. When one firm can draw customers away from another by cutting prices, the two will be able to cover only their costs, given the same production conditions and proportional costs, since competitors will underbid each price which rises above cost. This conclusion, which has little to do with any conceivable reality and was rejected by Stackelberg, can be avoided in various ways in modern theory, among them, in particular, by the assumption that the setting of prices takes place under conditions which correspond to an infinitely repeated game. If duopolists have already made profits and repeat their game only once, the threat of underbidding may be real. If, however, the game is repeated indefinitely often, given plausible assumptions, each duopolist faces the following alternative: either he lowers the price and temporarily attracts all of the demand to himself, thereby earning a particularly large but one-off profit, or he maintains prices hitherto set which promise lower profits but over a long period of time. If both duopolists calculate in this way, they will, as a rule, find it is advantageous for both to follow the current pricing policy and, consequently, to maintain market segmentation (Tirole 1990, p. 246). Historically, of course, another objection has been raised against Bertrand, first of all by Edgeworth, who introduced a capacity limitation which did not allow any one duopolist to supply the entire market. In that case, a non-negative profit must be achieved, because if one firm which cannot satisfy demand by itself charges a price that will only cover its costs, there remain consumers for the other firm at a price somewhat in excess of the costs; the price that covers costs is not an equilibrium price. Stackelberg implies that Edgeworth assumed price fluctuations as a consequence of this disequilibrium; this outcome, however, is not the only possibility.

What is interesting for us here is that the resulting uncertainty of solution, which is for Stackelberg the most important outcome, is accepted by various authors. Thus, in *Wesen und Hauptinhalt der theoretischen Nationalökonomie* [The Nature and Essence of Theoretical Economics], Schumpeter points to Bertrand's conclusion and objects, 'It should be added that that would be very inept behaviour, since if they did *not* do it, even without prior agreement, they [the duopolists] could ensure the advantages of monopolist position – which, however, would be distributed among them.' For Schumpeter, the outcome remains open because of uncertainty over the division of the market, 'no supporting hypothesis providing any further assistance' (Schumpeter 1991 [1908], p. 269). There followed a return to Cournot, briefly mentioned by Wicksell (1977, p. 97) as follows:

Edgeworth . . . and . . . Bertrand . . . criticized Cournot's reasoning, but in my opinion, on insufficient ground. It is certainly true that the problem . . . will to some extent be indeterminate . . . but Cournot's further assumption . . . seems to me much more reasonable than the one selected by Bertrand and Edgeworth.

The latter involves the assumption that each monopolist aims at the maximum net profit on condition that the other does not change his price – an assumption which seems to me quite unjustifiable where they both produce the same commodity.

Wicksell wanted to return to Cournot's assumption that each took the quantity of the other as given.

Passing over Stackelberg's remarks on the Lausanne School and on Bowley, we finally come to his evaluation of Chamberlin and Robinson. Stackelberg (1934, p. 83 [p. 275]) cites Chamberlin: 'Duopoly is not one problem, but several.'¹⁸ This is apparently the deciding objection, and it corresponds precisely to the position taken by modern theory, which seeks to ensure a clearly outlined field of application for each of the solutions offered by Cournot, Bertrand, and Stackelberg by introducing additional assumptions. Stackelberg (1934, p. 85 [p. 277]) responds, 'In our opinion the task of duopoly theory consists in showing which among the conceivable "additional premises" actually is a possibility for the duopolistic market. Chamberlin did not do justice to this task.'

According to Stackelberg's understanding of the theory, market form itself should determine behaviour. Instead of changing his theoretical understanding when encountering failure, he turns to history and policy; the conclusion of the chapter includes, among other things, a critique of Joan Robinson's 'Individual Demand Curve,' whose core idea has already been suggested.

If a theoretical approach proves inconclusive in certain respects, it is not only admissible to render potential conclusions more certain by introducing additional theoretical assumptions. It is also legitimate, even necessary, to explore reality for more exact conditions or to seek answers in neighbouring disciplines, such as political science. In economics, theoretical deduction is not the only form of scientific activity. Stackelberg, however, did not turn to careful historical research or to a survey of alternative economic formations, both of which could have taken him further. Instead, he chose a tendentious example, which is introduced as the solution to a question posed by a contemporary real development. He thus contributed to the discredit into which the historical method, which could have been and was driven by political goals completely different from those of Stackelberg, has fallen in Germany.

Stackelberg's theoretical model (1934, p. 94 [p. 286]) presented him with a 'construct completely without equilibrium, continually subject to shocks, fundamentally chaotic', which follows from the analysis of oligopolistic situations and which is contrasted with the smooth functioning of competition. The competitive economy is disturbed by political intervention and social convention. The opposite is true for the real economy, to the extent that it is characterized by oligopoly and bilateral monopoly. It 'functions not despite, but because of, the "constraints" noted' (Stackelberg 1934, p. 95 [p. 287]). To some extent, this corresponds to the Modern results mentioned previously, according to which behaviours which in the simple repetition of a game prove unstable might in time stabilize with infinite repetitions. However, Stackelberg takes a different point of view:

The free capitalist economic system is therefore the more endangered, the purer the form in which its characteristic basic features are realized. And so we can say: in the era of concentration the free capitalist market is therefore the less stable, the more rigorously the rationalization of all economic activities is pursued.

(Ibid., p. 95 [p. 287])

Apparently, Stackelberg is alluding to the interpretation of the origin of modern capitalism as a process of rationalization which has become familiar primarily through the work of Max Weber – a process which Weber himself perceived as fateful and unavoidable.¹⁹ ‘Everywhere that traditional action prevails instead of rational action, the lack of equilibrium in the sense described above is absent, as already explained in the first paragraphs of this chapter’ (Stackelberg 1934, p. 99 [p. 291]). What remains of this hypothesis, which was characteristic for the epoch of the youngest Historical School? Certainly, the tautology is correct that a tradition which has become entrenched – such as the idea of a particular fair price in handicrafts – remains in force. But in modern conditions, it can also be *rational* to preserve conventions, as the argument based on game theory demonstrates. I would be prepared to admit that traditional rationality, in Weber’s sense, is capable of supporting such behaviour, where calculated self-interest stands in its way. Modern economic history, however, has become more wary of invoking tradition as a form of explanation. How shall we eliminate the possibility of a price war between two smiths, both of whom wish to be the sole supplier in a Medieval town? Just as there were price wars earlier, a price today can conversely result from a carefully considered implicit agreement and, seen from the outside, appear to be unpremeditated ‘tradition.’

A few years later, Eucken was pleased to be able to draw upon the variety of market forms and related equilibria to develop a differentiated picture of the range of economic systems in the past. He defined market forms not by counting the number of market participants, but by behaviour. Thus, given the same number of suppliers, a market might be an oligopoly if participants reacted reciprocally to the quantities supplied by others, while he spoke of a partial monopoly, where asymmetrically smaller suppliers took the behaviour of a larger supplier to be given (Eucken 1940, p. 121).²⁰ Eucken, moreover, differentiated between open and closed forms of supply and demand. Openness meant, specifically, free access to the market, while closeness meant some state restriction on such access. He provided numerous historical examples of closed market forms, from handicrafts (e.g. the regulation of the number and hours of journeymen) to the distribution of land after conquest, as well as the fixing of prices prescribed for private businesses by the large state sector in Ptolemaic Egypt. For him, closed monopolies were the strongest expression of economic power: the Hanseatic League, which subjugated Norway economically through the monopolization of trade in Bergen, and the Ravensburgers or Augsburg trading societies, but also, in an entirely different sense, modern central banks (Eucken 1940, p. 228).

Thus, quite naturally and without going into detail concerning the problems of oligopolies, Eucken showed how a revision to the theory employed by Stackelberg

(without extending its analytical apparatus) and the multiplicity of solutions to problems of imperfect competition, could be linked to the range of phenomena in historical reality. According to Stackelberg, in contrast, we have

. . . to differentiate between the following possibilities:

- 1 the elimination of market forms which lack equilibrium;
- 2 the elimination of free price formation;
- 3 the elimination of the principle of maximum returns (particularly the profit-making principle).

(Stackelberg 1934, p. 99 [p. 291])

The first possibility would consist of an active competition policy, as later called for by ordoliberalism; no further consideration is devoted to this possibility. He does not believe the elimination of free price formation through cartels to be sustainable. When it is successful, the result is that ‘the profit-making principle . . . reduces economic productivity and in general indefinitely increases the frictional resistances of the total economic process’ (ibid., p. 101 [p. 293]). There remains state intervention or, going further, ‘integral market regulation’, as it was called in Fascist Italy. He rejects the so-called idealistic interpretation of fascism (‘identity of individual and state’ or ‘corporate conscience’) as an unrealistic abolition of the principal of maximum utility. The corporate state instead has ‘functions of stabilisation and the setting of objectives.’ In the final analysis, it ensures the balance of interests.²¹

In Stackelberg’s argument, the opposition between the principles of satisfying need and the acquisitive principle plays a role which Sombart had used in his *Moderner Kapitalismus*. Stackelberg had already explored this opposition in his dissertation. In *Marktform und Gleichgewicht*, the acquisitive principle is interpreted as a special form of the principle of utility maximisation (Stackelberg 1934, p. 5 [p. 197]). In Stackelberg’s review of Eucken’s *Grundlagen der Nationalökonomie* [Foundations of Economics], which showed his interest in the connection of theory and history, he identified Eucken as ‘the person who completed the doctrine of economic stages and economic styles’ (Stackelberg 1940, p. 256 [p. 862]) In this discussion, which is of great general interest, the principle of satisfying need is now finally identified with the maximization of utility within the household, the acquisitive principle being identified with the maximization of profits. Both principles are maintained against the arguments of Eucken, who had criticized Sombart’s use of them, on the grounds that they are actually two different things. For example, application of the acquisitive principle suggests that when prices rise, demand always falls, which cannot always be proved with the maximization of utility (Hicks had also pointed out this difference in connection with the income effect). A connection can once again be drawn to Max Weber, who viewed the separation of ‘enterprise’ and ‘household’, which had once formed a unit, as a characteristic of the rise of capitalism. The Aristotelian conflict for the head of household, between meeting needs and acquisition,

is dissolved through the separation of roles: as head of household he maximizes utility, and as entrepreneur he maximizes profits.

Stackelberg's theory is therefore based on evolutionary ideas. In his textbook, he will later say that as a result of competition, 'the composition of the body of entrepreneurs is subjected to a process of natural selection' (Stackelberg 1952 [1943], p. 314). There, too, the state is assigned the task of creating an equilibrium in oligopolies and bilateral monopolies, and generally: 'In certain spheres of price formation, however, no reasonable exchange is possible without the active participation of State' (ibid., p. 214).

So, it turns out that Stackelberg's research programme amounted to a search for evolutionarily stable behavioural patterns and institutions. His definition of stability analyses profit-maximizing behaviour, which also proves robust when faced with variations in the circumstances of oligopolies. Maximization strategies are complemented by conventions if a problem should repeatedly arise. The evolutionary perspective, as it is emerging with Hayek's or Williamson's successors, is a contemporary response to the question of the connection of history and theory, which inspired Stackelberg's generation.²²

Paul A. Samuelson's *Foundations of Economic Analysis*

When Paul A. Samuelson's *Foundations of Economic Analysis* was published in 1947, it was immediately clear to most reviewers that this book raised the theories of general equilibrium, of price and the trade cycle to a new level, a feat comparable only to John R. Hicks's *Value and Capital*. At the same time, it was also clear that the work represented a methodological breakthrough. Up to this point, no one had known how to use the language of mathematics in economics so consistently and so extensively. Samuelson then became familiar to a broad audience with his textbook *Economics: An Introductory Analysis*, which was published in many editions and used by students all over the world for several decades. It became universally imitated. In America, he won popularity with his contributions to economic policy. Today he is considered the 'economists' economist,' since for six decades he repeatedly surprised the technical world with new models, in which, time and again, he managed to give a striking formulation to basic ideas which then, as often as not, proved capable of progressive development.

Niehans (1990, p. 420) has written that 'The model building era, finally, was most completely embodied in Paul Anthony Samuelson – no theorist has created more models that others found economically interesting and inspiring.' He also makes an illuminating comparison: 'Samuelson's principal contributions are found in his papers. He is the Picasso of economics, creating his works in an abundant stream, usually at a rapid pace and apparently for the joy of it' (ibid., p. 424). The twentieth century was fascinated by Picasso's creative genius; he has been filmed painting on glass so that the onlooker can see exactly how rapidly and precisely he works. For pedestrian economists, this comparison might appear overblown, but there was something in Samuelson himself which inspired awe

even in his opponents. It is not just the volume and the content of his work, but also its form. Again and again, he surprised readers with the deceptive simplicity of his mathematical approaches or his use of the English language, ranging from slang to literary allusion.

Paul A. Samuelson, born in Gary, Indiana, in 1915, studied in Chicago and at Harvard.²³ He was a contemporary of the early formulations of the theory of monopolistic competition and also supported the Keynesian revolution, which caused an uproar in his student years during the Great Depression and Franklin Roosevelt's New Deal. In Chicago, he became familiar with Marshallian microeconomics through Jacob Viner; his exploration of Keynesianism took place under the influence of Alvin Hansen. He later spoke of Joseph Schumpeter only with respect, although his background, character, and scientific style differed so greatly from this great teacher. In 1940, Samuelson went from Harvard to the Massachusetts Institute of Technology (MIT), where he remained, leaving only occasionally. He began to publish at the youthful age of 21. Soon, he was publishing approximately five scientific essays per year – often contributing to controversy – and updated his textbook every three years.²⁴ Despite his economic influence as an author and role as a government advisor during the Kennedy era, theory remained his priority. Samuelson also wrote many essays on the history of theory, contributing, for example, essays on von Thünen, Wicksell, and Fisher to the German reprint series *Klassiker der Nationalökonomie*.

'The book is a sensation,' said Erich Schneider, welcoming *Foundations*.²⁵ Although actually a collection of essays covering a broad range of topics, they make the claim that the analysis is held together by only a few basic principles: specifically, through the hypothesis of optimization and the correspondence principle. Hence, the conditions of a system's dynamic stability and its characteristics, established by comparative statics, are mutually reinforcing; from the requirements for stability, additional characteristics of the system are derived which do not solely follow from optimization. 'The hypotheses of *maximisation* and *stability* thus constitute the twin pillars upon which Samuelson's edifice is erected,' wrote Lloyd Metzler (1948, p. 906) in a review. As Samuelson emphasizes in his introduction, the analogies between the results of various individual theories suggest the existence of a higher-level theory, which has to be identified. This unity in diversity of modern microeconomics is Samuelson's real subject. The utility of general theory remains low if it allows only the derivation of statements lacking in specificity.

The example given by *Foundations* has since then led to such a broad formulation of equilibrium that, for instance, the hypothesis of utility maximisation in a model of pure exchange does not permit the derivation of the required statement that demand, as a rule, goes down with increasing prices. Following on from theories by Sonnenschein, Debreu (1983), and others, we now know that for given aggregate excess demand curves, preferences of agents can be constructed in such a way that utility maximization creates the given excess demand curves – demand curves which not only fall but, contrasting with the usual economic intuition, can also rise. And just as under conditions of a pure exchange economy,

demand curves which are not necessarily normal emerge for consumer goods, even in an intertemporal equilibrium with only one representative agent, factor prices and demanded factor quantities could, contrary to expectation, move in parallel and not simply in opposing directions, if a technology is given which permits reswitching in the comparison of long-term equilibria. Consequently, those capital theoretic problems, in which the existence of an aggregated production function is problematic, emerge even in general equilibrium theory with production.²⁶ At the time of the composition of *Foundations*, these results were unknown. Samuelson's historic attempt to broaden the basis of economic theory without reducing the specificity of the statements derived from it did have limits. Nevertheless, the attempt remains instructive. Objections were also raised against the correspondence principle, since dynamic stability analysis can be modelled for a particular equilibrium system in a variety of ways, which can then lead to contradictory results, although economic intuition almost axiomatically assumes stability. Frank Hahn consequently declared the correspondence principle to be both a natural postulate and a 'nonstarter' (Hahn 1983, p. 35).

In *Foundations*, Samuelson (1975, p. 264) emphasises the existence of various concepts of stability. He was also aware that the conditions for stability and maximization are not always sufficient 'to indicate definite restrictions as to algebraic sign of the rate of change of our variables with respect to any parameter' (*ibid.*, p. 19). Samuelson was always prepared to revise and consolidate his results in the light of new research.

Foundations offers a wealth of applications for central economic ideas, including, among others, welfare economics, the theory of index numbers, the stability analysis of Keynesian systems, and international trade. Reviewers were astonished by the young Samuelson's mastery of the contemporary literature. Today anyone interested in the history of theory can discover that in his special area, Samuelson recognized, in an appropriate manner, the contributions of contemporaries and predecessors, upon whom he based his ideas. Besides this, there are implications, only some of which Samuelson elaborates, since he did not want to weigh the book down too much, and because he personally avoided polemical confrontations.²⁷ If a classical work of economics is one in which many important traditional approaches to economics are included and from which just as many new and fruitful ideas come, then Samuelson's book certainly belongs among them.

With some justification, Samuelson saw himself as a historical figure. He had an extraordinary memory for the sources of fundamental ideas, for the essential connections, but also for people, texts, and even situations – his methodical approach and, above all, his intelligence made it a joy to observe him in seminars. Before an idea was finally presented to other listeners, Samuelson had already classified the assumptions, explained the line of attack of the argument, and, if necessary, politely informed the speakers – to the extent that it survived this scrutiny – about the significance of the result. In tracking down and reading relevant literature and in the methodical questioning of his guest speakers, he worked tirelessly to maintain an overview of the ever-expanding field of economics. In *Foundations*, we observe this rare scientific talent working with a youthful energy.

John R. Hicks's *Value and Capital*

Which other author would dare to begin with such a self-confident claim? 'I am almost entirely concerned with novelties,' John R. Hicks (1968, p. 1) writes in the first paragraph of *Value and Capital*. We might recall Gossen, who introduced himself as the Copernicus of economics; he was a premature advocate of a new movement whose flowering he would not live to see. Hicks, by contrast, was more fortunate: economists immediately adopted his arguments and made them the subject of a series of controversies, without forgetting the person who had inspired it all. This was a book that gained a great deal of attention from the beginning and which over the years became a classic, read again and again. Intelligent beginners work through this book so that they might move from the textbook to fundamental problems. Leading theorists turn to this book to develop macroeconomic thinking, considering unsolved questions of microfoundations: Hicks presented a triumphant advance that echoes to this day. The book was first read in the Anglo-Saxon world and in Western Europe. Michio Morishima (1992, p. IX sq.) has described how, as a very young student in 1942, he relied on his reading of Hicks to orient himself within the domestic opposition to the policy of imperial Japan and how this intellectual effort established the direction of his later scientific work. Today this work provides Russian students with a bridge to Western scientific economics.

Hicks actually did not want to write present 'principles' or a textbook, not even an advanced textbook, but the book is often used in that way. 'Principles' can, of course, be original – think of Marshall – although, on closer examination, many forerunners have been found for many of Hicks's classic innovations'. Indeed, a significant part of his achievement lies in the creation of a synthesis. But in view of the variety of areas covered in *Value and Capital*, working through this text today in terms of the history of economic thought is still no small task.

Hicks modelled his work on the authors of the Lausanne and Austrian Schools, neither of which were well-known in England in the period between the wars. He not only read the texts in the original – which might be expected – and knew how to present their ideas effectively. In his hands, 'static' and 'dynamic' analysis were placed in a new relationship by the introduction of the concept of 'temporary equilibrium'. Nineteenth-century authors, whether Classical or Neoclassical, based their analyses of growth and development on long-term equilibria, which gradually deformed under the influence of increasing population, technical progress, and changing conditions for saving and investing. In the comparison of long-term equilibria, structural shifts were observed and, due to capital accumulation and growth in productivity, national income increased in sequential cyclical upswings. Hicks, in contrast, began with short-term temporal equilibria. In so doing, he focused on new concepts and the stability of equilibria as central questions. Moreover, he introduced a dating of goods and discussed intertemporal equilibria with perfect foresight. He assumed their existence but shifted stability analysis from partial to general equilibrium and pointed out the possibility of multiple general equilibria.

The idea of a temporary equilibrium had to be introduced with given expectations which could be changed by stringing together a sequence of such equilibria. Hicks was not the first who developed a discussion of temporary and intertemporal equilibria, for similar considerations were found in the Swedish School and in Hayek.²⁸ However, Hicks managed to interweave microeconomic statics with macroeconomic dynamics, leading to a new approach which has become paradigmatic for modern attempts at microeconomic explanations for macroeconomic processes. He admired Walras and Pareto for their description of the activities of agents in consumption and production. However, he believed that there was some merit to the claim that the Lausanne School doctrine was futile, as long as it did not manage to describe *changes* in the system.²⁹

Garegnani considers that Hicks turned from the observation of the deformation of long-term equilibria as a means of describing the dynamic of capitalist development to the examination of the process with the aid of intertemporal and temporary equilibria because Neoclassical Capital Theory did not allow for the analysis of long-term equilibria without contradiction.³⁰ Böhm-Bawerk introduced the supply of capital as an aggregate value magnitude. It could be compared to the demand for capital in the long-term and be derived from a unified interest rate. However, consideration of general equilibrium demands that capital be in a disaggregated form in order to determine interest through supply and demand. If capital is given in a general equilibrium but in a disaggregated form (consisting of heterogeneous capital goods), the conditions of a long-term equilibrium with a uniform profit rate will be met only by chance. A temporary equilibrium has to be used as the method of analysis, or use has to be made of something other than the Neoclassical Theory of distribution (which is what Garegnani suggests).

Whether it actually was this consideration which led Hicks to favour the idea of a temporary equilibrium is an open question, since he adhered to Neoclassical Distribution Theory as his starting point. What is certain is that his introduction is also quite suitable for the Keynesian concentration on short-term underemployment equilibria, which come into existence as a result of pessimistic business expectations, something which Hicks noted in *Value and Capital*.

With the IS-LM-Model (Hicks 1937) in its original two-sector form, Hicks formalized in summary fashion the most important ideas behind Keynes's *General Theory*, which became extremely popular in the even more simplified one-sector textbook form. The connection to Keynes which Hicks forged in *Value and Capital* did not link to Keynes's modelling but, rather, highlighted the modern problem of the microeconomic foundations of Keynesian theory. Whether Hicks switched from long-term to temporary equilibria due to an aporia in Neoclassical Capital Theory or whether Keynes's influence encouraged the treatment of expectations, the alternative advanced by Garegnani ignores a third possibility important today: that Hicks independently recognized the value of sequential dynamic process analysis and adopted temporary equilibria as its basis.

In an intertemporal equilibrium, unexpected events are only generated exogenously:

It is possible . . . to conceive of an economy in which, for a considerable period ahead, everything was fixed up in advance. If all goods were bought and sold forward, not only would current demands and supplies be matched, but also planned demands and supplies. . . . Thus inconsistency disequilibrium would be removed [i.e. a disequilibrium resulting from contradictory expectations – BS]; but the possibility of disequilibrium due to unexpected changes in wants or resources would not be removed.

(Hicks 1968, p. 136)

It is entirely different with temporary equilibria without perfect foresight. The ‘Spot Economy’ represents an extreme case here:

A system of private enterprise is perfectly conceivable, in which there would be no forward trading, all transactions being for immediate delivery (‘spot’). . . . Only current demands and supplies would be matched on the market; people would have to base their expectations on future prices, as best they were able, upon these current prices and any other information available.

(Ibid., p. 135 sq.)

When the transactions of the ‘spot economy’ repeat in a stationary form, there need not result any conflicting expectations; however, it will be more difficult to predict structural change. Hicks concludes, ‘When conditions are at all disturbed, a spot economy must be expected to get out of equilibrium to a considerable extent’ (ibid., p. 136).

Hicks goes on to look into the stabilizing and destabilizing influences of interest, monetary subsystems, price and wage rigidity, and the investment process, although he, time and again, returned to the formation of expectations. The sequence of temporal equilibria is examined only at the end of the book, in terms of accumulation and cycles. And here it is unmistakably difficult for the author to determine the direction of macroeconomic development, based on the developed microeconomic foundations.

The openness of such processes is a source of fascination for the new evolutionary economics. *Value and Capital* is still oriented to a Neoclassical full-employment equilibrium, modified by rigidity and a lack of information, but the possibility of replacing this norm is apparent. Development is not derived from long-term ‘underlying’ theories but instead proves to be path-dependent and, under certain conditions, chaotic in the mathematical sense. Such an open attitude to development conflicts with the reasonable expectation that each present is derived from the result of rational or, at least, understandable efforts in the past. Moreover, it cannot satisfy theorists who seek developments following prescribed laws to discover and establish prognoses. Modern theory has shown us, however, that we often cannot exclude chaotic developments in economic models, and Hicks’s analysis of temporary equilibria points toward this modern result, a result which fills someone seeking the meaning of history with dismay (Bliss 1994).

Hicks was innovative in his treatment of ordinal utility theory, in the intertemporal extension of the equilibrium, and in the investigation of its stability. However, he was at his most original in the introduction of the temporary equilibrium. The tension between the dynamics in the sequence of temporary equilibria and his stability analysis, based on static conditions, could not, of course, be satisfactorily resolved. 'Although there were distinguished predecessors . . . , the exposition of consumer's choice in the first part of *Value and Capital* is a *tour de force*. . . . In its essentials it stands like a rock' (Hahn 1994, p. 17). For non-specialists of consumer theory, writes Hahn, Hicks's text today includes everything they need to know. The representation of production is also satisfying for modern Neoclassical readers, as the static system is preserved. In contrast, Hicks's process analysis in *Value and Capital* had yet to take a definitive form; in *Capital and Time* (1973), we find Hicks's 'traverse analyses', which failed to attract many followers and to which a parallel in Lowe (1976) exists. In this area, theoretical development took a less determinate path. Hicks's indirect influence on evolutionary theory today appears more far-reaching than the specific forms of process analysis which he presented.

Stability analysis became an immediate influence, because Hicks was the first to show how income and substitution effects determine the stability characteristics of the entire economy. When Samuelson's *Foundations* (1997 [1947]) was published, the lack of an explicit price adaptation dynamic in Hicks's work appeared to be a deficiency, but in the meantime, Hicks's programme has come to be seen as complementary to Samuelson's (they are not identical in their results); naturally, Samuelson has had more successors and achieved more satisfactory results.

Economics in the second half of the twentieth century was more influenced by American economists, while English economists had a greater influence on the first half. England, and Cambridge, in particular, followed Marshall's tradition, which defended Keynes against the innovators at the London School of Economics. Although Hicks contributed to the creation of a general equilibrium, which had been neglected by Marshall, *Value and Capital* was in many ways an 'English' book: written with some style, avoiding modernisms, well conceived mathematically, but moderate in the application of mathematical instruments (Hicks did not attempt to master its more complex aspects); theory was supposed to remain applicable and useful, if possible. He later went so far as to rank theories according to their historical applicability.³¹ He maintained a lifelong distance to 'American' mathematical economics, as embodied at a higher level of abstraction by Samuelson's *Foundations*.

Hicks was born in England in 1904. He studied at Oxford, taught at the London School of Economics at the University of Manchester, and finally moved to Oxford. In collaboration with his wife, Ursula Hicks, he published and advised governments in the area of public sector economics. He was a member of the British Academy, was knighted in 1964, and was awarded the Nobel Prize, along with K. J. Arrow, in 1972. His versatility is often noted (he also made a name for himself as a monetary economist), and his originality strikes one again and again, because he always attempted to develop an idiosyncratic approach in his books and articles.

The other side to this independence in thinking was the scantiness of references to the works of others. I came in contact with him many times in the

last two decades of his life and was each time inspired with admiration for his quick understanding of essential connections, his judgement, and his modesty. However, before the publication of *Capital and Time*, I met him after a lecture and called his attention to the similarities between his model and special cases of models derived from Neumann and Sraffa. This did not have the desired effect of inducing him to make a more careful statement in his own work. Instead, he left it to his readers to make appropriate comparisons, and there was no shortage of dissertations and theses which sought to do just that.

The reviews of *Value and Capital* recognized its importance. The majority of reviews expressed approval, even enthusiasm, for it, but there were also commentaries which expressed reservations. Among these, Oskar Morgenstern's (1941) contemporary response is of particular interest. Morgenstern advocated the newer viewpoint, described previously as the 'American' approach, and specifically called for a more complete formalization and the use of mathematics. He also knew, in contrast to most English and American reviewers, the relevant Continental sources. He therefore immediately voiced reservations about Hicks's advances in the theory of consumption by pointing out, above all, Slutsky's essay in the *Giornale degli Economisti* of 1915. As opposed to Hicks and even the Samuelson of *Foundations*, Morgenstern was clearly conscious that it was in no way sufficient to count up equations in order to confirm the existence of an equilibrium. In seminar discussions led by Menger and, in particular, from von Neumann, he had learned that the use of proofs of existence required the use of new mathematical methods (fixed-point theorems) with which economists of the time were unfamiliar. 'We are merely at the threshold of an economic science' (Morgenstern 1941, p. 374), he declared and at the same time criticized Hicks's stability assumptions. His critique of Hicks's attempts to explain the formation of expectations is still worth reading. The economic plans of agents cannot always be identified *ex ante*, and – when they are – they cannot always be interpreted. They are not in general consistent and therefore cannot be aggregated. He criticized Hicks's theory of interest and, above all, Hicks's application of the term 'elasticity of expectations' to the interest rate. Hicks had called a system stable if the expectation elasticity equalled unity. This definition, however, includes the case of inflation with a constant positive rate as well. Morgenstern also criticised the eclecticism that became apparent at the end of the book in Hicks's theory of cycles.

By contrast, Machlup (1940) and Lerner (1940) came out very much in favour, the first dealing with Hicks's statics and the second with his dynamics in successive review essays. Machlup's overview clarified some details regarding production and consumption equilibria and called readers' attention to the fact that Hicks did not always remain consistent in the assumption of perfect competition (the fixed price method). He was also surprised that Hicks had not employed the new insights offered by the theory of imperfect competition. Lerner also took exception to this and thought that Hicks's critique of socialism was, as a consequence, too simple. He showed that Hicks was only in a position to reinterpret Austrian capital theory in an incomplete manner. Harrod, whose own growth theory was among the first of the new wave of growth theories, was both admiring and critical, Hicks failing

to impress him only in respect to his treatment of growth. Thus, the reception of Hicks's book was largely positive and has remained so. Many reviewers declared immediately after its publication something that has been confirmed in the last sixty-plus years – that *Value and Capital* is a classic.

Alfred Müller-Armack's path: from interventionary state to the social market economy

German concepts of regulatory policy [*Ordnungspolitik*] and the social market economy, which remain of importance to science and policy in Germany, were not conceived by one single person but result from the work of many. In the mid-twentieth century, they responded to the challenges of economic crisis, of economic control by the National Socialists, and of central planning in the then-forming Eastern bloc by a liberal revival. The fame of co-founders such as Rüstow and Röpke has since faded somewhat, though their persistently stated claim that economic policy must be conceived in terms of generations and therefore also take social policy tasks into consideration still deserves a hearing today. A broader public is probably most familiar with the names Eucken and Müller-Armack: Eucken, because in his *Grundlagen der Nationalökonomie* [Foundations of Economics] (1990 [1940]) he developed the standard method of analysis for various economic forms and systems; while Müller-Armack made the most important contribution to the acceptance and dissemination of this concept. Müller-Armack's *Wirtschaftslenkung und Marktwirtschaft* (1947) [Economic Guidance and the Market Economy]) introduced the term 'social market economy' to the public and attracted enormous attention because, in the troubled post-war years, it was generally believed that such guidance was necessary.³²

Wirtschaftslenkung und Marktwirtschaft was entirely focused on the contemporary situation – in decisive contrast to the fundamental character of Eucken's main work – and should not be seen as representative of Müller-Armack's work in general, because he not only worked in various economic disciplines, but he also made important contributions to the sociology of culture and religion. His essay '*Zur Religionssoziologie des europäischen Ostens*' (1945) [The Sociology of Religion in the European East] demonstrates how Müller-Armack continued the tradition of Max Weber. There is naturally a strong connection between the path-breaking book focused squarely on the contemporary situation and Müller-Armack's sociology of religion: the concept of economic style. He was convinced that each epoch had a style, understood as 'unity of expression and behaviour', of its own, which both marked and was influenced by the economic sphere. This idea and the approach connected with its application is today considered unproductive by many economists. Partly this is because they prefer analytically sharper system concepts, partly because they wish to distance themselves from the humanities, but also because in the humanities the concept of style is used with more restraint – although artists believe they have to develop their own styles, and consumers are likewise driven by fashion and styles which they believe express their individuality. Müller-Armack would no doubt have objected that this desire for variety

characterized the Modern style and could not exist without fundamental common values such as freedom and toleration.

Alfred Müller-Armack was born in Essen in 1901. In the difficult years following the First World War, he studied economics and was throughout his working life associated with the University of Cologne, from 1926 to 1938, and then from 1949 until his death: beginning as a faculty assistant from 1926 to 1938, and ending as emeritus professor. He first became a full professor at the university in Münster in 1938. In the post-war years, he devoted much time and energy to economic policy. In 1952, he was named a section head in the federal Ministry for Economic Affairs under the direction of Ludwig Erhard.³³

Müller-Armack and Erhard had known each other since 1941. In November 1947, Müller-Armack was appointed to the special office for 'Money and Credit' on Erhard's instructions. The related telegram indicates the conditions in which economic policy was carried out before the Currency Reform: 'Presence requested in conference of experts. Treat invitation confidentially. Wire arrival time without delay . . . and if housing is required. Please bring bedclothes' (Watrin 1980, p. 20). In his time as state secretary, Müller-Armack remained closely allied with his minister, despite occasional tensions. His most important tasks included the preparation of European treaties and the organization of the Community of Six.

The period between Müller-Armack's resignation as state secretary and his death in 1978 were politically momentous years: the chancellorships of Erhard and Kiesinger, the social-liberal coalition, and a generational change which found its most visible expression in the student unrest of the late 1960s. In this period, Müller-Armack worked on outlines for a future reshaping of the social market economy, which in the eyes of liberal economists today moved quite far – perhaps too far – in the direction of a new interventionism, in favour of socio-political redistribution and environmental protection (Müller-Armack 1974a, pp. 163–70).

In 1973, Müller-Armack also wrote an instructive essay, '*Die wissenschaftlichen Ursprünge der Sozialen Marktwirtschaft*' [The Scientific Origins of the Social Market Economy] (1974b), which provides some insight into the origins of his ideas. In this essay, Müller-Armack objects to the charge that the social market economy had merely been a successful election slogan (*ibid.*, p. 245); it was, however, 'the only alternative which has been found in our time of central direction, of communism, of regulation' (*ibid.*, p. 245).

Then he writes,

Scholarly studies of the emergence of our modern industrial society since the sixteenth century have prepared the way for the contemporary conceptual world of the social market economy. I am referring to the post-Marxist investigation of capitalism which flourished in the years between 1900 and 1930.

(*Ibid.*, p. 246)³⁴

Müller-Armack remarks that today this period of economics is almost forgotten, and only older people – a few of whom still survive – now remember it. There are

recent signs of a modest renaissance in these ideas, which, for the time being, of course, exists primarily in their rediscovery by intellectual historians.³⁵ Müller-Armack believed that National Socialism had buried a great deal:

... in any case Max Weber's fame has survived the period ... in other connections. However, the work of Strieder on the origins of modern capitalism, the works of Böhm-Bawerk, Gothein, Lederer, Oppenheimer, Löwe as well as the socialists have all but disappeared. Schumpeter's work, as a form of dynamic theory, has survived, but his important works on the analysis of capitalism are hardly mentioned.

(Müller-Armack 1974b, p. 247)

Müller-Armack also mentioned von Mises. The essential achievements would have been the appropriation of that part of Marxist theory that had not been refuted, although the theory of the capitalist production relations, which was too simple, had to be replaced by a conceptualization in terms of economic systems and styles, as well as economic conditions and rules. Perhaps Marx's most valuable contribution, in Müller-Armack's view, was the attempt to create a social and economic conception of dynamics; Schumpeter had taken this up, cleansed it of erroneous assumptions, and appended it to his new growth theory. And finally: 'This era stood under the sign of capitalism. In my "Developmental Laws of Capitalism" of 1932, I myself attempted to provide a theoretical conclusion to this topic' (*ibid.*, p. 248). Müller-Armack therefore stated clearly enough that his own ideas about the social market economy were based on economic analyses from the 1920s; there remain, however, two more instances. On one hand, in every period

... the scientific basis [is] laid for the supersession of a dualistic anthropology, which is either an idealistic anthropology from a spiritual point of view, or a naturalistic anthropology, as advocated by Marx and before him Lamarck and Darwin. ... Philosophical anthropology has broken through this immanence with its interpretation of the specific form of human existence. Humanity obtains its biological and spiritual unity through its historicity.

(*Ibid.*, p. 249)

Humans are historical beings who are always arriving at new solutions, thus assuming no permanent connection, and for whom, therefore, there is no ultimate natural solution – for example, the nationalization of the means of production.

Alongside philosophical anthropology, conversely, the idea of consolidating competition – forestalling the interventionism which characterized economic development in the first third of the twentieth century – came as the second extension of research into capitalism. The idea of 'organized capitalism', the cartelization of the economy itself, appeared to have consigned liberalism to irrelevance. It was time to give space back to the free market economy by defining rules. This last notion, however, came to Müller-Armack only in view of the collapse of the guided market economy.

We want to deal here with the development of Müller-Armack's thought in its later stages. Because of the lines of historical development, which will be examined, it might be thought that the social market economy was a German solution to a German disaster. Its significance today, however, goes far beyond Germany; it is a conception which under this and other names has, in the meantime, developed into a European model – most concretely in the Treaty of Maastricht.

Early on, Müller-Armack showed considerable versatility in writing essays on subjective value doctrine, banking, the theory of history, and natural rights; his primary interest, however, was cycle theory. His doctoral dissertation (Müller-Armack 1923) focussed on the *Krisenproblem in der theoretischen Sozialökonomik* [Crises in Theoretical Social Economics]. He was then given the honour of outlining the current status of research on economy cycles and economic policy in the *Handwörterbuch der Staatswissenschaften* (Müller-Armack 1929). Besides Müller-Armack's usual analytical acuity, the essay provides insight into the characteristics, preferences, and deficiencies of German investigations into business cycles, which sought to connect theory and historical method.

Müller-Armack bases himself chiefly on Cassel, Lescure, Mitchell, Pigou, and Spiethoff. Besides German writers, he does therefore take account of international discussion. He also provides a list of the most important economic research institutes worldwide, together with their areas of specialization. He provides a summary of Kondratiev's theory of long waves and differentiates between cyclical phenomena and structural changes in the economy as a whole. There is greater emphasis on supply fluctuations than on price fluctuations, because only at times of 'great tension' do prices climb conspicuously; until that point, 'money market rates' are also low. Fisher, he writes, is wrong to focus on price fluctuations (*ibid.*, p. 647). Müller-Armack goes into detail about the correlations between various indicators, deals with methodical problems following Löwe, and distances himself from the notion that a cyclical theory could be developed from static equilibrium theory. He rejects fluctuations in harvests as a source of cyclical movements. Hawtrey's idea of starting from credit is much better. In socialist theory, the decline of the profit rate and a lag in worker consumption is decisive; here he is already examining economic and social aspects of theories of imperialism (Luxemburg).

Then comes the own contribution, whose significance, it seems to me, is somewhat hidden by a reference to Say. For Müller-Armack, it is critical that capital is accumulated not before but during the same period. Previous theorists were trapped by the notion that the means of accumulation had to be amassed during preceding periods, so that in the periods following, actual accumulation would be possible. Smith and Marx therefore wrote about 'original accumulation', which came about through the hoarding of money (Smith was thinking of thrift, Marx of the predatory exploitation of colonial possessions); this money, then, would have served the financing of the Industrial Revolution. In contrast to that, Müller-Armack thought that – at least, in the modern capitalist accumulation process and according to our terminology – investments created their own savings. If the entrepreneur decides to invest more, the credit system will make the necessary means available; thanks to the increased income of the general population, more will be saved, so that a balance of investments and savings is achieved in the current period.

Müller-Armack's language, still influenced by the phraseology of the Historical School and the absence of a concept of national income accounting, renders analytically precise expressions of his thought difficult. He writes, 'The act of saving leads to a smaller volume of real purchases being made in the consumer market than were previously invested in the market for producer goods' (*ibid.*, p. 653 sq.). From that comes the danger of underconsumption.

Saving only functions . . . to promote development when, simultaneous with the uptake of savings, they are profitably employed, which is only possible as a rule when the savings accrued in a particular period have already been anticipated by credit. In this way the form of savings moves in line with the creation of additional credit.

(*Ibid.*, p. 653 sq.)

Such savings are possible without compulsory saving. The increase in the amount saved at constant prices must be attributed to increased activity. This corresponds to the following formulation, anticipating Keynes: 'Active capitalist progress is not financed by saved consumer income; it does not draw its driving force from past results, but from the prospect of future profits' (*ibid.*, p. 654). Credit, as well as an increase in the money supply, caused by an influx of money from abroad, can bring about this expansion. With the tentative formulation set out here, Müller-Armack does not consider himself a revolutionary; he considers Schumpeter, Hahn, Hawtrey, Mises, Pigou, and Lavington to be his forerunners.

What is unique about this economic expansion is that it creates the conditions which guarantee its success. [. . .] This additional purchasing power has no foundation in the past; it is merely supported by the anticipation of future yields, although it is essential to understand that this anticipation of future yields is the basis upon which the realization of future yields takes place.

(*Ibid.*, p. 654)

This insight does, however, form only a preliminary consideration in the discovery of the wave path of the cycle. The cyclical boom, in which 'the economy seeks new directions' (*ibid.*, p. 655), will also be sociologically interpreted, following the example of Schumpeter. It is directed by 'changing elites'. From the standpoint of economic theory, these elites emerge 'by chance'. As is well known, Keynes and then, after him, Joan Robinson, talked of the 'animal spirits' of entrepreneurs when assessing influences on investment other than the rate of interest. Here he indicates how this vague phrase could have been endowed with historical content – the Historical School, having missed the opportunity to effect the integration of Keynesianism with social economics, a move which for Erich Preiser's generation seemed a possibility once more (Acham, Nörr, and Schefold (eds) 1998, pp. 31–70).

We have to omit here details of the analysis of cyclical trends which lead to particularly interesting statements on the theory of interest. As an economic policy-maker, Müller-Armack is not as optimistic as Hahn (or later Keynes); no economic

policy can make a boom last forever – just the same, he thought that an enduring depression was avoidable. His line of thought is based on Wicksell's interest spread theory; now the interest spread, however, affects quantities but not prices.³⁶

The positive side of the lack of analytical edge in Müller-Armack as a proto-Keynesian can be seen in his assessment of the possibilities of economic policy directed to the cycle. He already recognizes the danger that curbing a boom might bring about the disappearance of a growth trend (Müller-Armack 1929, p. 660). Such policy should not aim to suppress all price changes – we would say, above all, in money wages – since price fluctuations are not without a function. Credit policy offers a better prospect; this should start with regulating the financial system. Quantitative policies are only secondary. Müller-Armack assumes that the primary threat to the credit system consists not in too strong a contraction, but in an overexpansion. From the very first, he attempts to determine an employment optimum which does not correspond with absolute full employment (*ibid.*, p. 666). A regulation of demand can only be 'a defensive measure'. Ultimately, therefore, he believes himself compelled to take steps which we would call 'Keynesian', and for which he used labels such as 'intervention credit', 'wage subsidies', and 'support for consumption'. The multiplier may not have been formally developed, but he did establish that when measures are financed by taxes, 'even their imposition has a negative impact' (*ibid.*, p. 672). With full employment, there is a tendency toward price increases:

If however in the typical conditions of depression under-utilized factories face an army of the unemployed, then the impact of consumer credit is different. In this situation, where price levels can only be maintained at a high level artificially, an increase in purchasing power will not cause prices to increase, but at constant prices stocks of consumer goods will be run down and bring about an increase in employment in the consumer goods industry.
(*Ibid.*, p. 673)

There will then be some increase in demand in capital goods industries. But stimuli of this kind have only a temporary effect. Productive credit would have a broader effect, but all measures would be predicated on the mobility of the unemployed. He concludes with the remarks on socio-political measures, where he likewise immediately sees disadvantages linked to advantages.

From this careful assessment, with its many ifs and buts, we can see the beginnings of *Ordnungspolitik*. Müller-Armack seems to regard the formation of cartels as an especially hot issue which he prefers not to tackle. If the 27-year-old had wished to take, and been capable of taking, the energy evident in the density and range of this text and creating a systematic and analytical formulation of its main ideas, then he would have secured his place in the pantheon of the history of economics. But there is unfortunately no reward for the kind of overview and powers of judgement which he instead displayed.

As an economist, Müller-Armack reserved his deepest passion for understanding capitalist development. Doing justice to his early writings is the most difficult

task here. We will focus on *Entwicklungsgesetze des Kapitalismus* [Developmental Laws of Capitalism] from 1932. Marx and the socialists, Schumpeter, philosophical anthropology, the natural rights debate – all of this is worked through in an attempt to gain a new understanding of capitalist dynamics from the point of view of what has been learned from business cycle theory. Müller-Armack allows only the vaguest hints of the political orientation which underwrites the programme of value-neutrality he presents: ‘The aim of this study is not the evaluation of the present economic system’ (Müller-Armack 1932, p. 2). But he soon says that the correctness of the Marxist question has been forgotten because of the rejection of the Marxist solution. He wishes to complete what static theory definitively achieved in superseding Marxist value doctrine – replacing the labour theory of value – in respect of developmental theory: ‘It turns out . . . that the present dynamic phenomena in our economic system are not causal, but must be interpreted as processes of self-realization’ (ibid., p. 12). Marxism, like all ‘naturalistic theories of history’, attempted to explain cultural development by references to forces which treat men as natural beings. Mannheim’s analysis of ideology developed from this, and Müller-Armack interpreted psychoanalysis as part of the same movement. In contrast, a form of idealism developed which supposed the intellect to be autonomous, but this alternative, whether natural drives or intellect make up the driving force in history, whether they should be treated as causal or final, is a false one. Müller-Armack’s book is particularly strong in the critical development of this idea, i.e. in the presentation of the origins of both materialist and idealist reductionism and in pointing out their weakness in the unsatisfactory prediction of the course of history. But the more positive aspect of the work seems rather weaker. One also misses a serious consideration of the historical development of Utility Theory, which appears to be implicitly understood here to be a description of the motivational structure, although we know that it amounts to a decision theory which represents a possible neutral alternative, as against an alternative that Müller-Armack considers false. There is in Åkerman a significantly closer linking of the problems of socio-economics raised by Müller-Armack to the concept of economic theory. Åkerman’s socio-economic synthesis actually consists of permitting causal and final perspectives – the understanding of human decision-making as determined by the environment and its preconditions or as actively creative movements arising from the attempt to make sense of existence – to exist alongside each other and places them in economic science only according to a specific problematic and the given standpoint of an observer (Åkerman, 1938 [1997]).

Müller-Armack thus begins by taking up the Marxist notion that capitalism represents a ‘unified style’, ‘from religious dogma to technological form’: ‘Capitalism is the only economic system in history in which the dynamic has become a structural principle’ (Müller-Armack 1932, p. 28).

The new dynamics which Müller-Armack here discovers is that which he had elaborated in his work on business cycle theory, although he does not describe it as such in so many words. Even in a static state (stationarity in Schumpeter’s sense is meant here), capitalism has its own rationality, and this is something different

from traditionalism. This stationary state is eliminated by the appearance of an entrepreneur who makes expansion possible, creating savings through autonomous investments. And again: 'The process of expansion is not limited by the volume of savings initially available' (*ibid.*, p. 36).

The essence of capitalism should not be seen in the system of means, in the allocation mechanism, but rather in the will to action among the emergent European elites. Where these are immobilized, social ideas could force an expansion; hence, the 'internal lability of all capitalist social positions' (*ibid.*, p. 46). Whoever reads texts not to find confirmation of one's own ideas in the past, but to seek understanding of historical conditions, will understand that here Müller-Armack wants, in the context of the Soviet Union's five-year plans, to evaluate an imitation of the capitalist expansion process under different conditions. Similar to Mises, Müller-Armack believes continuing socialist accumulation to be impossible:

A socialist economic system is, even where strives for an expansion, predetermined in its construction. . . . The system remains socialist only so long as it is able to neutralize the consequences of this dynamic without relinquishing its form.

(*Ibid.*, p. 48)

Capitalism, conversely, provides '*carte blanche* to the anonymous entrepreneur' (*ibid.*, p. 48). 'With the exception of its character as an open system of anticipation', he writes, 'capitalism lacks all primitive contours' (*ibid.*, p. 49). In striving to define capitalism by this quality, Müller-Armack searches through alternative limiting concepts; he touches on the contrast of community and society, which could still be found in capitalism (a thought which remained quite characteristic of his later understanding of the social market economy as a unified style with communal elements) and combs through socialist class theory, which he rejects in favour of a functional theory of stratification.

Capitalism itself is subject to a complex developmental process which leads to 'interventionism', which has the tendency to increase – for example, cartels, interventions in financial services, and protective tariffs are discussed. 'Poorly-managed intervention finds itself constantly impelled to intensify its measures so that its failures might remain invisible' (*ibid.*, p. 111). Parliament could be understood not merely as the representative of given interests, but in an interventionist state could develop itself into an independent force (*ibid.*, p. 107).

In capitalist development, an autonomous process is thereby realized which sets it free from historical determinism. Insight into this process should be provided by philosophical anthropology; Müller-Armack examines Scheler, Dilthey, Heidegger, and others. Even the motivational structure of human beings overcomes environmental determinism; conversely, the spiritual is also connected with the human drive. 'The radical lack of background lends life the character of historicity' (*ibid.*, p. 145). From the potential subjectivism of this existentialist turn, the discussion leads to historical theory, whose mistake lay not only in its one-sidedness, an option for either materialism or idealism, but in the vain

attempt to determine the content of history. There is in history no factor which would not itself be subject to historicization and thus be mutable. However, each man remains rooted in his own historical situation.

A modern translation of this highly abstract discussion into the language of economics would probably read as follows: the economic process is understood here to be evolutionary; evolution cannot be reduced to mechanics or biology, nor is it oriented to the future through a constant set of ideas; it is by turns subject to each of these alternatives and is path-dependent. For Müller-Armack, however, humans achieve distinction in history by assuming responsibility for its formation; it would perhaps be better to say that they cannot avoid such responsibility. Müller-Armack would later seek, as a professed Lutheran, in his own conscience for the ethical standard which differentiates responsible action from arbitrariness or self-interest in a narrow sense, as a researcher in the sociology of religion; here, however, such thoughts are generally lacking, and a dangerously empty space opens up. The rejection of determinism is consistent with the rejection of the great historical syntheses: 'The visualization of the past can only be achieved by empirical historical research, the determination of the future only through historical acts' (*ibid.*, p. 174). The theory of historical understanding is quite broadly sketched, influenced by Dilthey and Herder, too, as the discoverer of the unified styles of cultural history: 'Cultural morphology and the sociology of knowledge are the scientific expression of modern historicism' (*ibid.*, p. 177). Müller-Armack rejects the reduction to doctrines of ideology and turns, finally, to the political form of capitalism. According to liberal doctrine, it should have led to an 'international, peacefully-exchanging society' (*ibid.*, p. 193); however, individual political powers have grown ever stronger, and classical liberalism missed the opportunity to secure itself politically.

The provision of such security would later be the aim of the social market economy; in this Eucken, Röpke, and Rüstow agreed with Müller-Armack. In 1932, Müller-Armack was apparently not yet in a position to see this task as the duty of his generation. At the end of the book, he deals with the interventionist state of the early twentieth century, he struggles with theories of imperialism, and he considers autarky policy an alternative.³⁷ In it, 'nationalist capitalist interests, supported by a national idea that is half-real, half-invented for the purpose', are united (*ibid.*, p. 213). There is an increasing drift towards an interventionist state; there is a lack of control and 'once the fact of the nationalization of the economic system is solidly in place, a theory of economic policy which determines the optimal organization of this interventionist system can no longer be avoided' (*ibid.*, p. 218). In this way, Müller-Armack drew his theory from the critique of Marx, tracing out a dynamic economic theory which determines the lines of development of modern capitalism. However, the final decision over the choice between the national orientation of the interventionist state and the preservation of Liberalism through 'regulation', a task today given to *Ordnungspolitik*, is not raised or, at any rate, remains unexpressed in this book.

It should be mentioned that in 1933, Müller-Armack initially opted for autarky, openly aligning himself with the National Socialist movement in a pamphlet (Müller-Armack 1933). He began cautiously: 'This era really does not make it

easy to see precisely what is happening in the present, to say nothing then of interpreting the meaning and purpose of what is coming' (ibid., p. 7). The movement was 'radical' and yet had an 'internal balance', a 'revolution from the right'. What follows is a powerful summarizing of historicism, which he divides into two parts. In some passages, especially where he strikes a political false note, he shows his teeth: 'Goethe thought Herder's ideas the most beautiful interpretation of the text: God so loved the world. History is here the past which has the power to bind the present' (ibid., p. 14). Historicism later becomes historical relativism; trust in history becomes scepticism and critique, man is stripped of his freedom through the subsequent determinist historical interpretation. Yet to this is countered freedom of action, as exposed in the previous book.

However, after visualizing the spiritual and intellectual struggles of the nineteenth century, he abandons its humanist connections; the new dictum is: 'The "national movement" is the mobilization of historicism . . . Whoever wants the nation must unreservedly affirm the historicity of our form of existence which recognizes the people as ultimate concept' (ibid., p. 18).

This switch to a voluntarism, which even then was unpleasant but which in retrospect is quite insupportable, now goes on for pages. The influence of the 'new movement' here is unfortunately evident in the language ('mobilization'). Perhaps it says something for Müller-Armack that the pamphlet, after the recapitulation of previously discovered insights on historicism and after the decisionistic turn to an unelaborated conception of the people, has very little substantial content. He attempts to explain the functionality of a corporate structure for the economy, referring to the Carta del Lavoro of 1927, which describes the individual as someone owing service to the nation. The multiplicity of groups, labour unions, and parties would have to be abandoned: 'The corporate framework . . . should supersede the condition of the parliamentary state in which economic interest groups seek to exert influence on government leadership or parliament, thus imperilling the power of the State to make decisions freely' (ibid., p. 51).

The few concrete things that do appear in the text are, when compared to what we remember of those twelve years, comparatively harmless. Müller-Armack now sees the way opened to a more systematic anti-cyclical policy. He saw the preservation of small-scale agriculture as a socio-political concern; he wondered whether the department store, which might perhaps technically be superior, disrupted social relations; and he hoped, in particular, that autarky could help to reduce cyclical sensitivity (ibid., pp. 55–61). During the crisis, the parliamentary state had not had the courage, when faced with declining revenue from taxation and increasing social burdens, to seek means for 'extending credit'. There are no anti-Semitic statements or calls for the use of violence in the pamphlet.

Von Stackelberg and Sombart were two other important German economists who enrolled in the cause of National Socialism. With the former, there was also a substantive relation between theory and political practice; von Stackelberg had discovered the instability of equilibria in oligopolies and called for stabilization through a stronger state. With a stronger state, Sombart saw the possibilities of countering the economic crisis and spoke out for what we would today understand

as a critique of consequences of technology, to ensure the preservation of the environment. Müller-Armack probably outdid the other two in his use of emphatic language. His public turn toward liberalism after the Liberation, in fact, as well as in scientific argumentation, was therefore all the more decisive.³⁸

Just as Eucken withdrew during the Nazi era to write his *Foundations*, which worked with historical illustrations, Müller-Armack wrote his famous *Genealogie der Wirtschaftsstile* [Genealogy of Economic Styles], in which he carried on the tradition of German economics, historically and theoretically, after his own fashion.

Just as art history has established styles of artistic creation as a unit of expression of various arts, economic research also has to face the fact that our economic forms do not exist by themselves in isolation, but are in history found in groupings of forms, in which common intellectual motives seek appropriate expression.

(Müller-Armack 1944, p. 5)

The setting of an economic style is done by history itself; Müller-Armack does not conceive this as the creation of the subjective observation of an onlooker. He is not interested in an aestheticization of the economy, but rather in understanding the importance of ‘the major ideological systems for economic development’; he therefore differentiated, in particular, between confessional zones. The concept of style had first been used intentionally at the end of the nineteenth century but had long before been used tacitly – for example, in both Conring’s and Achenwall’s comparative statistics. It could be added that similar efforts can also be found in the writings of the Scottish Enlightenment. The investigation of economic styles developed as a new extension of the doctrine of stages, which Müller-Armack considered to be a narrowing of the older comparative statistics. ‘Style is thus the visible unity of expression and attitude across the most diverse areas of life in a given period’ (ibid., p. 21). This frequently cited definition makes clear the difficulty of applying an internal affinity – between, for example, the ideal level of confession and the sensory-concrete level involving the comparison of artefacts (in economic terms: use-values, Schefold 1999) – to economic facts. Müller-Armack lists the following as interrelated characteristics of the modern era: the dynamic attitude toward life in new enterprises; a new type of state which seeks, among other things, colonial expansion; the claim to control nature; rational technology; the development of finance; the public (not feudal) funding of state and church; the development of the household (independent of the firm); and ways of meeting needs which are all imbued with new meaning.

The ideal types of style would not be created by a methodological template; they would have to be revealed through the historical process itself. ‘Only through researching the living, leading values in a particular epoch can it be understood what people sought, and why this or that style had to develop’ (Müller-Armack 1944, p. 25). As values which could be attributed to the present style, we could probably name equality, including gender equality; the rejection of the primacy of tradition; tolerance; an experimental approach to new lifestyles; the desire

for eventful experiences; the rejection of transcendence and the tragic; and the advocacy of the principle of desire; although, of course, a strong preference for leisure does not dominate life as a whole, because we can also observe a persistent search for vocational identity, even at the cost of the family relationship. Müller-Armack's own examples, by contrast, are oriented to historical developments. Inserting a genealogy of earlier economic styles, he proceeds from the observation of a magical worldview to the animistic era and then from polytheism to monotheism. With regard to polytheism, for example, he says that the state is infused with a sacred aura and becomes the guardian of religious organization (*ibid.*, p. 39). Naturally, similar things could be said of the Middle Ages. My impression is that Müller-Armack's account, in comparison with those of the younger Historical School, is particularly strong in the area of primitive cultures and then again in the treatment of European development from the Age of Reformation onward, while in his investigation of the ancient world and the Middle Ages, he does not improve upon his predecessors.

Capitalism presents itself as a broadly comprehensive style, with many historical variations. The different forms of Reformation and the Counter-Reformation in different areas led to a branching-off and to the parallel development of forms. They are, first of all, described as religious movements; then Müller-Armack actually traces their economic forms down to their role in the everyday world. The cultural and spiritual currents of the Renaissance and Humanism did not, in his eyes, leave such an impression as that which came later: the religious upheavals affecting all social strata of the population. As evidence, Müller-Armack refers to such documents as the Albertinian and Ernestinian pamphlets in the coin controversy of 1530. He takes up Max Weber's 'great ideas' and compares Calvinism with Lutheranism; more radical than Lutheranism, it allowed 'the energy of its ascetic-religious convictions . . . stream into worldly life' (*ibid.*, p. 95). The new principles are already materially apparent in dealing with church property, in the reorganization of handicrafts, in trade practices adopted from the Protestants, in a genealogy of enterprise forms and, particularly, in the treatment of poverty. Even the inscription on the prison is Calvinist: 'I avenge no evil, I enforce the good' (*ibid.*, p. 241). Recently, Cosimo Perrotta (1998) has shown the various approaches to the treatment of poverty which emerged in European states of differing confession. These are all in evidence in what we today call 'social policy' or 'economic education'.

The concept of economic style (Klump 1996) is still occasionally employed today (Schefold 1994c; 1995a). It is, however, often viewed with scepticism, because its use grew from intuition and visual impression (*Anschauung*), rather than simply from objective data. A rich description of older economic styles requires a broad education and hermeneutic penetration into old texts, which are difficult to read. The study of mentalities remains an important strand of work, but it does not link up with other elements in the way that an examination of economic style requires. The New Political Economy is reintroducing the kind of reductionism which Müller-Armack rejected, in which the concept of style is used one-sidedly in a search for a historically universal principle of acquisition and

historically specific rights of possession. There is finally the occasional accusation that economic style as a concept refers only to static relations. By contrast, Müller-Armack's book, whose main section starts with the Reformation, is dedicated to the *development* of style.

We cannot deal in greater depth with the study of economic style here, nor do we wish to evaluate it. It is nonetheless strange that the constant use of the phrase 'social market economy' [Soziale Marktwirtschaft] in current affairs has become detached from its original formulation as a particular economic style. Müller-Armack's early work focused primarily on questions of cyclical control, the explanation of capitalist economic development, and the analysis of style; he himself wished it to be known that the social market economy was unquestionably understood as an economic style, while today the general public is hardly aware of this background.³⁹

Müller-Armack did not write an autobiography, but he did put together a collection of his papers, *Auf dem Weg nach Europa. Erinnerungen und Ausblicke* [The Path to Europe. Memories and Outlook] (1971). He remarks in his opening that economic policy as a technical means has certainly always existed.

However, it was only with the ending of the First World War, which had completely overturned European political forms, that a revaluation took place: economic policy displaced national and dynastic forces, and moved into the foreground of economically relevant facts. . . . Walter Rathenau's phrase, 'the economy is our fate' emphasized this transformation.

(Ibid., p. 11)

Whoever has read the English classics would put the turning point elsewhere, for Ricardo as a theoretician and a member of Parliament experienced economic policy the way Müller-Armack describes it here. In the German-language area, even Jacob Burckhardt would not recognize that the economy had become one of the 'powers' of world history.

Müller-Armack had begun his studies in 1919. During his time as a student, he observed how historical economics was compromised by its failure during the great inflation. He therefore turned to theory, and his research into cyclical problems anticipated later developments. From 1929 to 1933, 'cyclical policy inactivity' prevailed, while, subsequently, the National Socialists carried out job creation by brute force. He consequently praised 'the conscious promotion of the modern instrumentaria of economic policy' (ibid., p. 16). He then spent nearly twenty years extending the Weberian theory of Protestantism into the eighteenth, nineteenth, and twentieth centuries, simultaneously examining the Eastern European and the Byzantine Greek church.

This original extension of the Weberian sociology of religion had as its starting point a journey Müller-Armack made in 1943 to the Balkans with a delegation of leaders from the textile industries – an adventure not only because it took place during the war, but also because under the National Socialists, travel abroad was almost impossible, and before that, in the 1920s, it had been quite difficult because

of the troubled economic situation. He thought the Weber thesis to be confirmed by Calvinists he encountered in Catholic Hungary, and he experienced the tradition of the Orthodox Church in renouncing to resistance to changing rulers. His account is strewn with descriptions of striking landscapes and accounts of personal meetings.

A second group of papers turns on the intellectually fruitful discussions which took place in difficult circumstances in the early post-war years, when economic policy was supposed to shore up the social market economy. For Müller-Armack and his like-minded friends, the religious foundation was of great interest: 'Our first problem was the attempt to develop a Protestant social doctrine analogous to the Catholic doctrine which was likewise founded upon natural rights' (*ibid.*, p. 42). In the Mont-Pèlerin Society, Müller-Armack met both neoliberals of a Hayekian stamp and international theorists: 'Attempts to introduce policy related to society, social objectives and policies to improve the life-sphere [Vitalpolitik] of the kind which Röpke, Rüstow and I sought to realise met with little response, if not perhaps outright opposition' (*ibid.*, p. 45). Nevertheless, he respected the neoliberalism of its 'highly qualified representatives'.

In 1952, Müller-Armack joined the core section of the Ministry of Economic Affairs and became the secretary of state for European Integration in 1958 (remaining in this post until Erhard resigned as economics minister in 1963). The law against limits to competition may not have turned out ideally, but it still placed limits on the tendency in German industry to form cartels, as had happened in the 1920s.

Müller-Armack's later memories concern his contributions to European integration. He played an important role in economics and even at times in politics, bringing him into contact with the major governmental leaders of the era. Descriptions of meetings with Chancellor Adenauer and with Pope Pius XII, the preparations for the Conference in Messina and the Rome Treaties, the drama of the Hungarian crisis, and the preparations for the candidacy of Spain and Portugal present a very lively narrative, in which there are also occasional economic observations:

Examples of highly-skilled crafts which were shown to us demonstrate that Spain, like all lands with old Catholic cultures, had preserved its capacity for handicrafts through the centuries, which should ease the transition into modern industrial production once the entrepreneurial forces have become stronger.

(*Ibid.*, p. 158)

Cultural evaluations constantly colour the judgement of historical situations. He remains optimistic about cyclical policy and thinks the success of 'deficit spending' in 1967 was remarkable (*ibid.*, p. 255); after the creation of the grand coalition in 1966, there was agreement on 'passing a stability law which equally emphasized price stability and economic growth, and brought about the creation of cyclical institutions and instruments that I had been advocating for decades' (*ibid.*, p. 254). But today cyclical policy is rarely used, since structural problems predominate. Müller-Armack finally returns to explore positions on economic integration and emphasizes that these do not necessarily imply

political integration – illusions about this were based on misinterpretations of materialist history. ‘Whoever seeks political union must, I think, pursue it directly’ (*ibid.*, p. 261). We are still confronted with this question.

For us, someone is of historical significance who, in a confused era, can with confidence point to a way out of confusion. In his youth, Müller-Armack had sometimes toyed with extremes, but in the economic want and intellectual bewilderment of the early post-war years, he stood before the public and recommended precisely those measures that would later lead into the so-called economic miracle. He had already staked his ground out in the 1930s: the prospect of holding your ground as a liberal, while also maintaining institutional security within a common, irenic framework, an order promoting freedom which permits a good outcome to flow from contradiction. Naturally, this ground had been contested, but now there was no more vacillation.

There is a certain contrast between the assessment of a situation as recalled by the persons concerned and that which more recent economic history provides. Memory tells of hunger arising from inadequate food allocations, from very crowded living conditions in bombed-out cities, and of difficult and time-consuming excursions in order to obtain daily necessities by trading on the black market. One might assume that it took some time for thinking to free itself of Nazi-era prejudice and adjust to democratic ideas and conceptions of human dignity. On the economic plane, scarcity seemed something that could be resolved by more consistent planning and allocation. How could the flood of refugees be managed if they were not given places to stay and so made further redistribution of shelter necessary?

By contrast, economic history points out that Germany’s industrial capacity had not been completely destroyed, and that, given the large amount of available labour, production could resume, as happened in other countries of Western Europe. Abelshausen’s exaggerated claim that the currency reform played only a minor role was initially hotly debated, but in the meantime, this debate has died down. His opponents had the better of the argument, claiming that the Reform had an important role in triggering the recovery (Buchheim 1998, p. 91). During the war, new investment outweighed destruction for a long time; fixed assets in the industrial sector were not only greater in 1945 than in 1938, but also more modern. Extensive repair was, of course, necessary; there was a scarcity of raw materials; and there was also a degree of dismantling in the West. Economic activity remained at a very low level (at half the level of 1935) until the middle of 1948, labour productivity was low, nutrition was poor, and low wages provided no incentive. An enormous excess money supply was accompanied by a price freeze. The Allies held fast to rationing. Relative prices were distorted. Firms remained on a downward trend; they renovated and hoarded scarce raw materials in the expectation of a sudden recovery, which arrived, in fact, with the currency reform. Preparing for and carrying out the currency reform is one of the most exciting chapters of economic history, into which we naturally cannot go here (*ibid.*, p. 117 sq.). It was linked to an economic reform which came primarily from Erhard and primarily consisted in a general relaxation of controls

and the unfreezing of prices. While many observers predicted this would bring about a recession, in fact there was a rapid increase in investment and productivity (labour productivity increased by 30 per cent between June 1948 and March 1949; *ibid.*, p. 135).

And so we come back to Müller-Armack and his classic work, printed on bad paper and delivered to poorly stocked bookshops in 1946. Even the foreword insists on the primacy of free organization and condemns regulations which had paralyzed the economy for more than a decade. First of all came the voices raised against control and regulation from abroad, from Hayek and Röpke. The irenic formulation was found:

The resumption of the basic laws of rational economic activity in no way involves the renunciation of an active economic policy corresponding to our social and ethical convictions . . . The 19th century notions of economic ethics which have since become meaningless must be superseded.

(Müller-Armack 1947, p. 6)

The first part of the book criticises economic control, starting with a historical perspective upon economic organization which resumes Müller-Armack's early arguments without elaboration. Once more, then, we confront a nineteenth-century liberalism which was wrecked by failure of the monetary and competitive order and by the theory of imperialism. What emerges more clearly than before is that the market economy form is more peaceful than any other form – since the experience of the First World War had led to a confrontation with imperialism and the Second World War with totalitarianism.

The functional problems of economic control are described in detail; there is no reference to the planned economies of the Soviet Union and economies in the emergent Eastern bloc. Instead, the point of reference is the economic system of Nazi Germany. Here central control does not displace entrepreneurs but binds them through the setting of prices, wages, and rate of interest, together with the control of investment financing. Quotas and rationing are also introduced. These are ways in which the authoritarian state mobilizes economic forces for its own ends, in which it is successful in the short term, in the same way that the regime is briefly popular due to the allocation of jobs and the stifling of inflation. But they are not adapted to actual scarcities, the business system becomes a benefits system, entrepreneurs become government officials, newly founded companies are obstructed, consumption will soon be throttled, and while the concentration of resources in particular technical areas may bring individual successes, this is at the price of restraining the general growth of productivity. The overuse of capacity cannot go on forever; the ability to adapt and the flexibility of capitalist economic development are based on maintaining reserve capacity. A cyclical policy suited to a market economy should not aim to maintain a constant boom but to achieve stable and steady growth.

The guided economy was built on political illusion, seeking, despite the lack of colonies, to control the export trade; irrationalism increased in the economy of

the occupied territories and especially with seductive promises of guided technical progress. Everywhere the guidance mechanisms became increasingly independent. Employment offices, whose primary task was initially to allocate work, became ‘institutions for forced labour’ (Müller Armack 1947, p. 63). They also served

a particular form of criminal law . . . to downgrade economically so-called politically unreliable people . . . [which] . . . also showed a tendency for economic regulation to be targeted against freedom even where, ostensibly, other ideals were professed.

(*Ibid.*, p. 63)

Germany had not yet become a democracy of its own. However, Müller-Armack now referred to this when he turned to the positive aspects of the (now explicitly named) ‘social market economy’. Montesquieu has shown that freedom thrives only where governmental powers are divided and the market economy ‘already corresponds, sociologically, to Montesquieu’s ideal’ (*ibid.*, p. 64). Often, when faced with petty economic difficulties, there is a thoughtless turn to measures which endanger political freedom, without any real feeling for its values. A ‘sophisticated market economy’ must set aside private pre-eminence – the final criterion of economic organization is the spiritual: the market economy would therefore be preferable even if it should turn out to be less efficient.

The essence of an economic system is not determined so much by its ultimate goals as by its sociological form . . . (the market economy is) the only sociological correlate for all political forms which strive for a liberal structure of spirit and State . . . the history of artistic styles teaches us how historical form endures only where there is a unity of style that pervades all areas of life. It is impossible to make an economic decision which has for a solution an outcome which contradicts the central spiritual values which one seeks to uphold.

(*Ibid.*, p. 69)

Müller-Armack thus introduces the social market economy as an economic style; the varieties of forms of economic organizations being demonstrated, in principle similarly to Eucken’s approach, by referring to a number of historical examples. He wishes to show in particular that the market economy assumed different forms during different phases of antiquity, both in the Mediterranean and in the Orient. He points to particular forms of labour (slave labour, bondage) and to the retreat of liberalism from domains of princes but thinks, however, that the formation of the market economy is not therefore concluded. ‘Liberalism has rightly been accused of considering the rules of competition to be a natural form which require absolutely no management, while in a developed market economy an organized, artificial form is visible . . .’ (*ibid.*, p. 84).

The decision today to allocate income according to performance implies no decision on the question of social justice – a careful formulation which leaves open the question of how to define social justice (*ibid.*, p. 85). Hayek doubted

indeed that the term can even be defined. The market economy would also survive if 'the economic process, through a particular planned configuration of economic space, [was guided along] existing channels. (ibid., p. 86). In this way, the social market economy is introduced as a new 'third form'; it is not a 'vague mixture', not a 'party-political compromise', but rather a 'synthesis of the full range of possible perspectives of our present moment' (ibid., p. 88). In view of the recent relapse into interventionism, restrained only in international competition by the word 'globalization', these definitions are today no longer adequate to the requirements of regulatory policy. Müller-Armack is therefore occasionally practically blamed implicitly for the re-emergence of interventionism. However, without his openness and readiness to adapt, the discussion would also certainly not have been focussed on the social market economy.

The central chapters of part II of the book are supposed to outline the principles of a controlled market economy. Müller-Armack managed to formulate clear and useable definitions of competition and price policy. He considers there to be an 'arbitrary element' in oligopolies and believes that intervention on prices would be justifiable, implicitly picking up on Stackelberg. (The dynamic theory of oligopolies has superseded this standpoint.) He believes, in addition, that market stabilization in agrarian markets is 'theoretically explicable'; then he returns to the necessity of a 'harmonious social order'. In this framework, he even includes aesthetic needs (architectural forms). The historic advance of actual social policy lies in the fact that Müller-Armack strictly rejects a social policy through the setting of prices and wage rates; if redistribution becomes necessary, then it must be done with a direct equalisation of incomes – a postulate that is finally beginning to be taken seriously in recent agrarian policy. He allows for progressive taxation, for subsidies for children, and for housing construction. Institutions which once represented an achievement in the face of set rates and rationing are today deployed excessively. His criticism of the National Socialist management of rent controls, for example, which prevented the construction of homes, shows that he had no yearning for a new interventionism.

Müller-Armack points to economies of scale of which advantage should be taken, but electrical and diesel motors have given small businesses new opportunities which the state should support. In export policy, he objects to abusive protective tariffs; he called in money, credit, and cyclical policy for 'currency adjustment' and outlined the measures which would have to accompany a currency reform. It will be almost entirely impossible in the future to do without anti-cyclical policy. 'Precisely at this critical point, however, it must be clearly understood that a therapy will be employed which, if administered in large doses, is outright poisonous' (ibid., p. 114). Finally, he returns to his main point: 'The re-establishment of the market economy can only be accomplished by means of a very radical act' (ibid., p. 142). The obvious thing would be to compare Müller-Armack's work with Eucken's posthumous work *Grundsätze der Wirtschaftspolitik* [Fundamentals of Economic Policy] (1959), which Eucken had nearly completed before his premature death in 1950; the 'radical act' of a return to the market economy had already happened. Eucken's book was used as a textbook for a long time, while the historical specificity of *Wirtschaftslenkung und Marktwirtschaft*,

together with some failings arising from its speedy composition, militated against such use, although its historical importance was recognised. Eucken's work, published somewhat later and somewhat more systematically organized, was essentially dealing with the same postulate but in the context of the initial success of the currency reform displaying greater self-confidence and therefore presented with somewhat less rhetorical zeal. The various forms of which a market economy is capable were neither for Eucken nor certainly for Müller-Armack automatically social; Eucken emphasized that 'social policy should not be viewed as an appendage to economic policy, but [has] to be to the fore of an ordered economic policy' (Eucken 1959, p. 179, my transl.).

That the content of 'social' has changed with time is clear in Müller-Armack's classic book and from the perspective of his life's work. Should we derive standards for basic necessities and for the roles imposed on us from the regional context, from a consideration of the situation in the Federal Republic of Germany, from a comparison with Europe, or even with respect to the whole world? In this last case, we could have to admit that there is no one in Germany who is not rich by comparison with the obvious misery suffered by millions of people in those areas struck by famine. What kind of work can one reasonably demand from the unemployed? Even during the first decades of the twentieth century, no man in full possession of his powers would have been considered needy if he had the opportunity to live off the countryside, feeding himself from his own labour as a smallholder. Faced with such a radical interpretation of social standards of comparison, whoever demands a share commensurate with that guaranteed to the needy in richer countries and also expects to participate in the cultural achievements of a locality, a nation, or Europe must be prepared to bear responsibility for the maintenance and further development of this culture as well. Those who are close together feel themselves more strongly bound, beginning with the family; however, responsibilities do not end at the nation's borders or even with humanity, if we also take the environment into account.

It turned out that it was not a national claim to power that would fulfil the possibilities of historical organizational forms but, rather, social obligation as part of a broader culture. This was, first of all, resolved by the establishment of a liberal economy system which allowed individuals to develop through meaningful labour, which maintained the competitive process and disposed of the inner bond that could set standards and limits for economic intervention and redistribution where necessary. In this, it seems to me, it makes sense to understand the social market economy as an economic style, as well as being Müller-Armack's spiritual legacy. Whether a new generation will accept that inheritance and identify themselves with its irenic formulation remains to be seen.

Market, policy, and society in Wilhelm Röpke

The victory of ordoliberalism in the emerging Federal Republic of Germany, although not complete and even less final, was not just owed to the advantageous conditions of the postwar years of reconstruction. It must also be understood as

the victory of an idea. Great Britain, at the same time, tested the alternative of social democratic economic policies, including comprehensive nationalisation, and fell behind. After Walter Eucken (1990 [1940]) and Alfred Müller-Armack (1999 [1947]), Wilhelm Röpke is the third mastermind of this idea of a renewal of liberalism in Germany to be represented in the series of *Klassiker der Nationalökonomie*. To these names, I would like to add Ludwig Erhard as a successful practitioner, whose book *Prosperity through Competition* (Erhard 1958) was very popular but written to justify and disseminate the new movement, rather than present its theoretical foundations.⁴⁰ The jurist Franz Böhm and the sociologist Alexander Rüstow are also mentioned regularly among the founders of ordoliberalism and rightly so. However, the distance between the disciplines would have made it difficult to include a work by one of them in our series. With its rich scope, covering historical-sociological and political aspects, as well as intellectual history, Rüstow's monumental *Ortsbestimmung der Gegenwart* can be compared to the work of his friend Röpke.⁴¹ Friedrich August von Hayek is often subsumed under a Freiburg School, but he was actually more committed to a Smithian liberalism; he is represented in our series with a theoretical text (Hayek 1995). In his *The Road to Serfdom* (Hayek 1944), Hayek already trusted competition to limit the concentration of economic power, even without state intervention, as long as the state does not directly create advantages for cartels and monopolies. In recent times, the ordoliberal thought among German economists took its orientation more from Hayek than from Eucken, due to the weakness of the competition policy (Schefold 2000c). Thus, we decided to complete our series with the triumvirate of German ordoliberalism: Eucken, Müller-Armack, and Röpke.

In terms of theoretical work, Eucken stands out from the other founders of the social market economy. His intention is to describe different economic systems as the realisation of different economic orders. It is the institutionally grounded order which determines how the problem of allocation is solved (i.e. by which combination of instruments from market and planned economies). These orders, the fixed forms of the market and the money and credit system, allow different combinations, not all of which are equally efficient, but which nevertheless represent ideal types that allow an approximate description of the historically given real types. Eucken does not want to accept the claim of the Historical School that fundamentally different economic theories are needed for different economic conditions. Indeed, he sets out from a single economic theory, which is Neoclassical at its core, but also contains some modifications that allow for imperfect competition, and so forth, to be taken into consideration. But nevertheless, his programme amounts to an alignment of different economic systems with varying economic models, which reflect differences in effective demand, income distribution, a.o., in addition to the market forms and monetary systems, which Eucken, in accordance with the economic knowledge of the time, also paid attention to in his analysis. These different models produce different sequences of events, and thus – in the sense of the Historical School – we may speak of different theories whose validity is limited by the actual circumstances (Schefold 1995c). In this perspective,

Eucken does not appear as an opponent, but as an end point of the Historical School (Labrousse and Weisz 2001).

Müller-Armack preferred to speak of economic styles, rather than economic systems. He tried to continue the tradition in the German humanities, which had set itself the task of describing the intellectual forces at work within a limited cultural space and in a certain epoch. During the war, he withdrew into an investigation of the religious character of economic forms and, in parallel to Eucken's *Foundations* (1950 [1940]), published his *Genealogie der Wirtschaftsstile* [Genealogy of Economic Styles] (Müller-Armack 1944).

Thus, immediately after the war, Müller-Armack was in a position to describe the national socialist governance of the economy as a deformation of the market economy, on the basis of aims and methods that were initially determined by ideology but whose interventions developed according to a logic of their own, because every disturbance of market processes by arbitrary steering measures causes undesirable consequences, which, in turn, lead to further attempts at correction until the ensemble of economic activities becomes entangled in dirigisme. The alternative concept of a social market economy, which Müller-Armack developed, included the removal of obstacles to a market economy, the reintroduction of competition, and social balance measures only for those who are unable to perform waged labour on the market for reasons of old age or health. In the question of the standards for measuring social balance, Müller-Armack relied more on the attitude individuals and the social values they have formed, as well as their preparedness for democratic compromise, than on norms and stipulations with a validity that is as general as possible. This flexibility stood him in good stead in politics, and as state secretary under Erhard, he was a successful practitioner.

In the end, the framework of ordoliberalism was not implemented as fully as Müller-Armack had wished for and as Eucken had demanded. And since the late 1960s, it was amended, adjusted, and modified to such a degree that one might ask whether Germany is actually still ahead of other countries with regard to ordoliberal policies. The late Müller-Armack himself spoke of a 'second phase' of the social market economy, in which he partly demanded a return to the strict principles of market economy policies and partly acknowledged the state's need to take on new responsibilities, for example, in the area of environmental policies. The most visible embodiment of ordoliberal policies was to be found in the Bundesbank, Germany's federal bank, which can act independently of directives from the government. Under the Maastricht Treaty, the Bundesbank's autonomy was transferred to the level of the European Union, while at the same time rules determining the maximum deficit of national budgets were introduced.

On the basis of his steadfast attitude during his emigration, his broad competence in economic questions, and the exceptional success of his books and other publications and as a natural continuation of his activities as an advisor on economic policy during the foundation the Federal Republic and during the first decades of its existence, Röpke could also have played a visible, maybe even decisive, role in Bonn or Brussels, if he had wanted to. However, faced with the

Roman alternative ‘*aut facere scribenda, aut scribere legenda*’ [to do things worth writing about, or write things worth reading], he did not chose the path of doing, but that of science and providing political advice – looking at the volume and character of his output, one may almost say: the life of a writer.

As an *homme de lettres*, he wrote in elegant style, full of literary quotations and historical allusions. Although he also made his mark as a theorist and an expert, providing reports on economic issues, his main strength was not the discussion of purely economic connections but the description of what in ordoliberal theory is called the ‘interdependence of orders’. For Röpke, the individual person was not a utility-maximising automaton but a passionate being that can only truly develop its possibilities under suitable conditions – that is, within a free economy, a liberal society, and a democratic state. The interconnections can show in disturbances, among which he counted not only imperfect competition, but also the sheer size of apparatuses of power within concentrated economies; not only low wages, but also the proletarianisation of the labour force; not just random disadvantages in the course of structural economic change, but the disappearance of the independent peasantry; not abstract external effects, but mutilated landscapes – these were the things that worried Röpke. In reverse, the interconnections show positively in the case of progressive historical developments. Röpke appreciated the social and political forms of the United States, Scandinavia, and Switzerland, while he was suspicious of France’s centralism. His main enemy, though, remained totalitarianism. He considered democratic socialism to be impossible. Because of his vivid characterisations, Röpke, compared to his fellow liberals, often appears more realistic in his analysis of individual problems. And because of his optimism regarding his ability to solve them, despite all claims to the contrary, at times he seems romantic and utopian.

The text we publish here, *The Social Crisis of Our Time*, shows Röpke at the height of his art – he himself spoke of a ‘first comprehensive picture’.⁴² Although many of his other writings are of independent value, all of them may be seen as essentially either a preparation or a continuation of what he has to say in *The Social Crisis*.

Wilhelm Röpke was born on 10 October 1899 in Schwarmstedt near Hannover. His father was a country doctor, and Wilhelm grew up in rural surroundings not far from what are today the nature reserves of the Lüneburg Heath. Later, the very different landscape of Switzerland became his second home.

Between 1917 and 1918, he was active in military service, and he was wounded in 1918.⁴³ He then studied political sciences [Staatswissenschaft], jurisprudence, and economy in Göttingen, Tübingen, and Marburg, passing his doctorate on potash mining in Germany in 1921, and his habilitation on the theory of economic cycles in 1922. A year later, he married Eva Finke. The marriage resulted in three children. After a short period working as an expert on questions of reparations in the Foreign Office, he received an extraordinary professorship at the University of Jena, which made him the youngest German professor at the time. In 1928, he was appointed to a full chair in Graz and then, in 1929, in Marburg. The astonishing scientific productivity of his early years stayed with him during his later life.

In February 1931, Röpke was asked to join the Brauns Commission, which was charged with reforming unemployment benefits and fighting unemployment. In this context, Röpke, together with W. Lautenbach, showed himself deeply impressed by John Maynard Keynes's *Treatise on Money* (Janssen 2000, p. 414), which had appeared in 1930. Röpke suggested an active approach to stimulating the economy, although, as we shall see, he would later clearly distance himself from the Keynes of the *General Theory*, especially in relation to the stimulation of demand as a permanent task.

In the run-up to the national elections in 1930, he published a call in which he warned against a new war and National Socialism, and as late as February 1933, he gave speeches against the party. Thus, after the NSDAP's 'seizure of power', he was first suspended for political reasons and then forced to retire. Röpke was one of the few individuals who would not have been prevented by membership in a left-wing party or their Jewish descent or personal connections to arrange himself with the regime and yet chose to emigrate.⁴⁴ 'In his physical appearance, Röpke at that time fitted what might have been the Nazi's ideal of a Young Siegfried to such an extent that some people found it hard to understand that such a man did not 'join in'' (Neumark 1980, p. 73). To Neumark, Röpke appeared to be 'a liberal of the old school, and moreover convinced that the nightmare of the "Third Reich" would sooner or later disappear, and that he would then again have to fulfil important tasks in Germany and for Germany'. In Istanbul, Röpke, who was well versed in the classical languages, as well as speaking several modern languages, laid the foundations for his later works with concentrated scientific activity and in friendly exchange with other emigrants. However, he engaged neither with the country nor with the Turkish language. And he was glad when, in 1937, he was able to move from an alien world, which was also too economically influenced by dirigisme, to the liberal world of Geneva. The same year, his *Die Lehre von der Wirtschaft* appeared, which would later be translated into fourteen languages.⁴⁵ Röpke taught as a professor of international economics at the Institut de Hautes Études Internationales until his death in 1966.

Röpke's closest friend in Istanbul was Alexander Rüstow. Rüstow's *Das Versagen des Wirtschaftsliberalismus* (Rüstow 2001 [1945]) was written during those years and is dedicated to Röpke. Rüstow distanced himself sharply from the old type of liberalism:

We distinguish between a market economy characterised by perfect competition, which is the normal object of liberal economic theory, and the subventionist, monopolistic, protectionist, and pluralist economy of the 19th and 20th centuries, which we call 'capitalist' and 'capitalism', and which is the result of a degeneration brought about by taking the principle of Laissez-Faire as an absolute, quasi-theological maxim. Throughout the world's history, this pathologically degenerate economic form has so far – fortunately – only ever arisen this one time.

(Rüstow 2001 [1945], p. 121)

The text traces the intellectual roots of liberalism back to antiquity and, in particular, gives an exposition of the Stoic roots of Adam Smith's liberalism. Thus, in Rüstow's work, economy, society, and politics remain closely connected with religion and philosophy, and in his *Ortsbestimmung der Gegenwart* [Freedom and Domination], mentioned previously, he juxtaposes the ideological foundations of the free world and totalitarianism.

This was also Röpke's theme from now on. In 1942, *Die Gesellschaftskrisis der Gegenwart* [The Social Crisis of Our Time] appeared as the first volume of a trilogy that was to be continued with *Civitas Humana* [The Moral Foundations of Civil Society] in 1944 and *Internationale Ordnung – Heute* [International Order and Economic Integration] in 1945. During and in the years following the war, Röpke also wrote for newspapers. Through the *Neue Züricher Zeitung*, his analyses reached a worldwide audience. Röpke recognised the dangers that would be associated with a continuing alliance between the United States and the Soviet Union, and he promoted the creation of the West German Federal Republic so that a line could be drawn between the satellite states in the East and the free West. At that time, Röpke was one of the most respected anti-communist writers in Europe (Hahn 1997, p. 16). Adenauer's policies agreed with his recommendations, and he was in contact with Ludwig Erhard, as well as being a frequent advisor of the German Federal government. He viewed the centralist tendencies within the EEC with growing scepticism, whereas he supported global market integration, liberalisation, the limitation of the welfare state, and the primacy of monetary stability (and thus was in favour of raising the value of the deutschmark). In 1947, Röpke was one of the founders of the Mont-Pèlerin-Society, which united the world's liberal economists. In politics, there developed a widening gap between the liberal ideas of Röpke and the practical policies of the Federal Republic's market economy under conditions of European integration. And likewise, within the academic world and the Mont-Pèlerin-Society, there was a certain contrast between the theoretical foundations for liberal economic policies based on the Anglo-Saxon and Austrian traditions and the social policies Röpke promoted (and which he shared with Rüstow, who was probably even more explicit in his commitments). The controversies which resulted from this situation did not change anything about the fact that Röpke could be considered globally one of the most widely read authors in his profession. He died early, in 1966, of a heart attack, in Cologny near Geneva, the same year that Ludwig Erhard was toppled as chancellor.

Before discussing Röpke's main work, let us take a look at a few texts that were written in preparation of it or belong to its context. In his published habilitation, *Konjunktur* [Economic Cycle] is understood as a term that is typically used in German-language areas and which does not yet denote the wave-like development of production to which it relates today: '*Conjunctio rerum omnium* (the linkage, connection of beings) is what the Roman and Greek Stoics called the Orphic, "untearable band", the chain of fate which . . . ties and connects together all being' (Röpke 1922, p. 1).

Conjunctio, Röpke says, was originally a term of astronomy, and even in Schiller it still means 'the constellation of things and temporal relations'. Then,

'*Konjunktur* becomes 'an expression for the incalculability and independence of social connections and relations, in particular in the merchant world'.

Thus, Röpke's book begins with an old-fashioned history and explanation of the concept and only slowly works his way through to theories of the economic cycle in the late nineteenth (Jevons) and early twentieth century (Lederer, for example). The most important building block in his analysis is Spiethoff's theory of the economic cycle. As the theoretical approaches at the time were not satisfied with describing a mechanism producing regular oscillations but also wanted to interpret every cycle individually, what was needed were specific factors which could trigger the beginning, i.e. an economic upturn, such as a decrease in 'psychic depression' or a low rate of interest. Such an upturn leads to a disproportionate growth in capital investments, the foundation of new businesses, which ultimately exceed the growth of demand and thus produce disproportionality, in the sense of Tugan-Baranowsky, and overproduction in large-scale industries, according to Cassel. Even a 'professional speculator who knows better . . . must swim along' (ibid., p. 21) with this tide. In this formulation, we can hear the Keynesian insight that speculative bubbles do not form out of the actors' independent judgements of the situation but out of their assumptions about other actors' interpretations of it (Keynes's 'beauty contest'). The opinion of the stock market precedes the opinion of industry. Thus, the theoretical understanding of economic cycles presupposed an understanding of mass psychology.

Public economic policy may try to slow down the upturn and to dampen the downturn which accompanies the increasing insolvency of those in debt, by implementing certain monetary and discount policies. In times of a depression, the state may also try to stimulate demand in suitable sectors of the economy, a possibility that was very seriously discussed: ' . . . the accusations still do not ebb away that the procurement of the railways leaves much to be desired with regard to policies affecting the economic cycle' (ibid., p. 127).

If the state does not make use of such means, Röpke says, the reason for this is, to a certain extent, not to be found in a lack of financial power but in a lack of will. The habilitation contains a vivid description of the process of the economic cycle and theoretical reflections on the uneven growth in different economic sectors, on the interdependence of demand and production, and on the nature of speculative behaviour. But it does not present an actual analysis of the circle and problematic connection between savings and investment.

Ten years later, the crisis was in full swing. By then, Röpke had read Keynes's *Treatise* and had become a member of the Brauns Commission. His book *Crises and Cycles* was ' . . . written during the worst and most widespread economic crisis ever recorded in the annals of economic history . . . ' (Röpke 1936, p. 1; Röpke 1932, p. 3).⁴⁶

However, this does not mean that we have entered a new epoch of world history. In order to avoid exaggerated conclusions, one should remember the time after 1918:

At that time, too, there were people who were quick to assume that the war-time economy had come to stay, who talked of the 'dethronement' of

gold and predicted the end, once and for all, of the competitive economic system, and the definite bankruptcy of Liberalism.

(Röpke 1936, p. 2; Röpke 1932, p. 4)

This charge can be understood as directed against all of the heterogeneous movements after the end of the Great War that were looking for a solution in socialism, in fascism, or in 'organised capitalism' (Hilferding 1981 [1910]). The catchword of the 'dethronement of gold', however, is a reference to Edgar Salin, who, although an old-style liberal at heart, had realised that the old international order of the time before the Great War could not be restored and, like Keynes, doubted that a permanent return to the gold standard would be possible – a doubt that turned out to be well-founded. In 1932, Röpke, by contrast, was of the opinion that the global economy and gold backing had been resurrected after 1918. We shall return to this discrepancy in opinion.

In Röpke's book of 1932, fluctuating levels of investment are responsible for economic cycles. In times of an economic upturn, planned investments exceed planned savings; in times of an economic downturn, the opposite is the case. Röpke describes the mechanism in the terminology developed by Wicksell and Keynes before the *General Theory*. He uses the cost-diminishing effects of technological progress as an explanation for the absence of significant price rises during the years of economic upturn between 1926 and 1929. Thus, he interpreted the economic development on the basis of Wicksell's theory of interest, i.e. the distinction between the real rate of interest and the market rate of interest, in which the nominal increase in the national product is the result of rising prices, a rising capital-labour ratio, and investments in new technologies. The possibility of fluctuations also occurring under stable technological conditions and stable prices, if there are changes in employment, is not identified by Röpke (Röpke 1936, pp. 113ff.; Röpke 1932, pp. 83ff.).

Röpke's specific contribution consists in the idea that a necessary and cathartic primary depression may be followed by a secondary depression because 'an independent and economically purposeless secondary deflation develops out of the unavoidable deflation of the primary depression' (Röpke 1936, p. 136; Röpke 1932, p. 90).

During a secondary deflation, the means of purchase are neutralised by savings, and an economic shrinkage ensues until either the level of investment rises or that of savings falls. A mass psychological mental block may extend the condition of secondary deflation. Of the crisis at the time, Röpke says that it has long since left the 'cathartic stage' behind, and this provides him with the intellectual space in which he may justify state employment policies, appropriate for the unusually depressed economic situation.⁴⁷

Thus, Röpke tried to account for what he saw as a historically exceptional situation by constructing a theoretical exception. His theory of investment, which he developed prior to 1929, followed the model of the Austrian School (Röpke 1929a). Capital formation, he writes, is an area that is scientifically neglected. It is interpreted as a shift of production from present goods to future goods, a shift that

is not begun by a prior accumulation of money or goods, because such an accumulation constitutes precisely an obstacle to this process. Rather, the shift is made possible by changes in interest rates and prices. In order to explain this further, Röpke, as is common, first describes capital formation in barter economies, where labour expended on the production of goods for consumption is redirected to the production of goods for investment. He then goes on to distinguish between three forms of capital formation in money economies, i.e. individual savings, self-financing of enterprises, and compulsive capital formation in the financial sector and through monetary policy.

Röpke prefers outside financing drawing on individual savings to self-financing, because loaned capital is used more cautiously. He is also worried that self-financing might become associated with the formation of cartels and the concentration of economic power. In the financial sector, private capital formation pushes out that of the state, and by capital formation through monetary policy, he means the manipulation of interest rates.

Hence, healthy economic growth depends on individual savings. Such savings may serve the purpose of building up reserves, in order to be able to invest in assets that yield a return and because consumption is saturated. The influence of interest rates is therefore not decisive, and the capacity for savings is described as depending on income. With this, Röpke comes close to a Keynesian consumption function (*ibid.*, pp. 25–30) and formulates an approach which is compatible with the later Neoclassical synthesis. Excess savings appear to be a possibility; such savings consign ‘the equilibrium of the economy to the scrap heap’ (*ibid.*, p. 37). Even before the outbreak of the global depression, Röpke was well prepared for its theoretical comprehension and for formulating suggestions for interventions. But it was part of the nature of his approach that a situation which justified state intervention had to be seen as an exception, rather than full employment being the exceptional limit case, as it is in Keynes. Röpke’s textbook on public finance confirms this. It was more theoretical than other such texts at the time. He tried to ‘keep the field to be investigated as free of the thicket of detail on tax laws as possible, in favour of a stronger emphasis on economic contexts than is usual in textbooks on public finance so far’ (Röpke 1929b, vol. 2, chapter III, my transl.).

But, nevertheless, he did not have in mind a permanent steering of the economic cycle. In his widely disseminated general textbook on economics (Röpke 1951 [1937], Röpke 1963), written in Turkey, printed in Vienna, and then banned in Germany, the point of departure is the spontaneous order of the market – an anarchic process without a human ruler, and yet operating in a rule-governed fashion. Against this background, Röpke then distanced himself radically from Keynes and Keynesianism.

Someone trying to reduce Röpke’s magnum opus to a few theses may find these trivial, whether one agrees with them or not. Someone who sees in their embeddedness within a panorama of history and contemporary history nothing but a source of literary pleasure will at least be able to enjoy reading the book but will still fail to recognise the intention of its author, which is no less than to change the way the reader thinks. As an understanding of his allusions to literature and

intellectual history requires a certain education, the circle of those addressed is limited. ‘*Pessimis displicere*’ (Röpke 1950 [1942], p. xxxvi) [Displease the bad] – this maxim of Boethius he adopted, and with the courage of a conservative mind, he refused to see his own times as the pivotal point of development so far. Had not others come closer to solving the problem of the right order for society?

The sun that shone on Homer is still smiling on us, and all the essentials around which life revolves have equally remained unchanged – food and love, work and leisure, religion, nature, and art. Children still have to be born and raised, and we may surely be permitted to presume that other times, without radio and motion pictures, have done better than we in this respect.

(*Ibid.*, p. 2)

The sudden fall into barbarism before the mid-twentieth century turned the triumphant belief in progress into pessimism. The developments of the nineteenth and early twentieth century used up cultural reserves, but ‘there can be no question of artificially “replanting Christianity for the sake of good conduct” (Jakob Burckhardt), . . . ’ (*ibid.*, p. 7).

Our relationship with the most elementary aspects of life is in disarray. Mass society, lacking in structure, becomes the first target of Röpke’s critique. The proletarianisation not only shows in wages that are too low and working hours that are too long, but also in the devitalising effect of life and work under conditions of large-scale industries. Machine production, mass production, and mass entertainment belong together as phenomena accompanying the disappearance of many independent existences. Families disintegrate, and the task of education is moved into schools. Village communities turn into suburbs. Democracy becomes tyranny, and where it still exists, it is disfigured by the ‘arrogance of vested interests’ and ‘. . . the decreasing understanding of the requisites of a well-constructed democratic state and of the sacrifices which have to be made for it . . . ’ (*ibid.*, p. 17).⁴⁸

Röpke stays clear of a political economy that would see the democratic process to be realised in a balancing of organised interests. The crisis of democracy leads to collectivism, and socialism represents the completion of the erroneous path of capitalism (*ibid.*, pp. 17f.). As Röpke realised even then, socialism is not even capable of avoiding fluctuations in the production process; there are ‘economic crises’ in the ‘socialist state’ (*ibid.*, p. 146).

Röpke wants to meet the challenges with a new economic policy, one that is conservative ‘in insisting on the preservation of continuity in cultural and economic development, making the defence of the basic values and principles of a free personality its highest immutable aim . . . ’ (*ibid.*, p. 21).

At the same time, this policy is meant to be radical and unprejudiced in the choice of its means. Röpke speaks of a new economic humanism, or, in the terminology he himself suggested but which has led to a number of misunderstandings, a ‘Third Way’ (*ibid.*, p. 32).

He encourages the reader to follow him by referring to tendencies which already point in the desired direction. He thinks the attraction of big cities with

millions of inhabitants is waning, and that there is a slow turning away from monumental style and monopolism – the World War, he says, may prove to be a cruel preceptor (*ibid.*, p. 25).

Röpke's hopes are based on those countries in which his aims are, to a large extent, realised. In particular, Switzerland is an example to be followed:

As the common enterprise of freedom-loving peasants and burghers, it [Switzerland] has offered the world a living example of the harmonious integration of peasant and city culture, and from this synthesis it has drawn the strength to fuse society's conservative and progressive forces, to blend continuity and flexibility, tradition and modernity, reason and faith, technology and humanitarianism, valour and love of peace, order and freedom, community life and individuality, prosperity and spirituality into a well-balanced whole. . . . The most essential elements of that strength, however, are clarity of thought and sureness of judgement . . .

(*Ibid.*, pp. 25f.)

At the time of writing this, Röpke had to fear for this country in which he had found refuge. When reading the eulogies on Switzerland that are scattered throughout the book, we are reminded that to begin with, this was a widely shared perspective in post-war Europe. Doubts regarding the Swiss model arose only a generation later when questions were asked over possible unfair advantages which the country may have gained due to its neutrality, its privileges as a financial centre, and the distance it maintained from European unification (Schefold 1991b). And the goals pursued by Switzerland are changing, too (Schefold 1996d). What nevertheless remains valid of Röpke's perspective, which is informed by its historical context, is the central question we must ask as readers today.

So far, we have looked only at the introduction, which, like all of the chapters that follow, is complemented with a series of short, fascinating digressions and discussions of further literature.

The actual argument and interpretation of the contemporary situation begins with a historical retrospection which contrasts the positive aspects of the eighteenth century, its spirited tolerance and internationalism, and its rootedness in tradition and enlightenment attitude, with the brutality of the French Revolution and the despotism that emerged from it.⁴⁹ Röpke thought very little of Napoleon or his later admirers, even less of those who imitated his form of rule, conquest, and government. The positive opposite to this is represented by the democratic movements in America, Scandinavia, and Switzerland but also England, whose roots he sees in their respective societies of free peasants on which the states' traditions rest.

The view of the liberal order emerging out of a process of self-organisation corresponds to the tradition of the Scottish Enlightenment and was also held by von Hayek. The German Historical School – in particular, Hildebrand – added that for this order to be hedged and preserved, a special moral effort, special human traditions, and thus advantageous historical circumstances are required (Schefold 1998c). Röpke accused classical liberalism of being rationalistically

constricted: 'Thus the market economy was endowed with sociological autonomy and the non-economic prerequisites and conditions, which must be fulfilled if it is to function properly, were ignored' (Röpke 1950 [1942], pp. 51f.).

The market economy is not an '*ordre naturel*, but 'a highly fragile artificial product of civilization' (ibid., p. 52). Today, Röpke writes, we know, . . . that competition reduces the moral stamina and therefore requires moral reserves outside the market economy; . . .' (ibid., p. 52).

Thus, Röpke formed a synthesis out of English and German liberalism which puts most of the blame for what has gone wrong on the nineteenth century, the time when the concentration of economic power, the formation of the proletariat, and imperialism led up to the fatalism of the twentieth century. However, in the interest of historical justice, we should not forget that during that same period, the Historical School associated the advancing economic development and the formation of the German Reich with the hope that technical and moral progress would combine.

Röpke's values are different ones. Friedrich List, he says, contributed to the undermining of cultural reserves and 'initiated a new and more robust period of acquisitiveness, of a realistic sense of life, of lusty participation in political and economic affairs, of a glorification of power and of "the cult of political unity and national expansion" (Jakob Burckhardt)' (ibid., p. 59).

By contrast, Röpke saw the eighteenth century as the time of humanity, of a humane balance, of pedagogy. Small cities such as Geneva and Weimar became centres of intellectual life, and, surprisingly, Röpke identifies Switzerland in the eighteenth century as a spiritual centre of European intellectual life (ibid., p. 71).

The chapter on political and economic systems begins with a quotation from Hölderlin: 'The state has become hell because men wanted to make it their heaven' (ibid., p. 83), before explaining the connection between the steering of production and political life with the use of a negative example: '[Socialism] wants to crown the work of emancipation, yet can result in nothing but the most abject subjugation of the individual' (ibid., p. 87).

In the absence of a market, the state must give the orders for production. While the bailiff is the last resort in a market society when deficient allocation processes lead to bankruptcy, the ultimate sanction under socialism is the executioner (ibid., p. 90). Exceptions, such as the planned war economies of democracies, cannot last long.

On the other side of the coin, 'social malnutrition' is the typical illness affecting a society that disintegrates into isolated individuals. At this point, the idea may arise that the formation of associations and, going even further, of corporatism and cartels represents a middle way between capitalism and collectivism. Here, Röpke needs to draw the lines more sharply. Associations are good if they further the quality of a profession and thus the pride in work. But they are bad if they hinder the functioning of the market through the formation of cartels. Thus, Röpke introduces differentiations that allow him to explain why the dirigisme of an Atatürk was closer to democracy and a market economy than to the national socialist regime and its methods of directing the economy.

The book faces its specific challenge in the third chapter, which undertakes to demarcate capitalism from the market economy.

Economic activity either is autonomous or is subject to orders. An individual farm can be run by a self-sufficient farmer or by a slave. Peasants as a community can be free or dependent serfs. A market economy enables consumers to be autonomous, while planned economies abolish the economic democracy of consumers. Röpke does not waste any time over Eucken's system of combinations between plan and market. Imperfect competition also falsifies 'the consumers' plebiscite' (*ibid.*, p. 104). By way of autonomous decisions, the market succeeds in keeping politics out of the economy, and international trade succeeds in avoiding violent battles over natural resources and imperialism.

Röpke's critique of capitalism, in contrast to Marx's, is not directed at wage labour, which he hardly mentions, but rather at machine production. While it may increase productivity and, at best, liberate people from drudgery, it frequently also creates a new desire for distraction, due to the monotony of labour; it affects marketing costs and urbanisation, due to the concentration of economic power; and it brings about a drop in quality, resulting from the exclusion of the crafts. Röpke's point is not to claim that we can do entirely without machines, and to that extent we must put up with a certain capitalist character of the market economy. But there is a broad spectrum of possibilities, as can also be seen when comparing different countries. Not everywhere do we find a predominance of large-scale enterprises; not everywhere does agricultural production rest on a rural proletariat; and not everywhere does competition law allow contracts that lead to market domination.

Then there is the private sphere:

... just as democracy must permit spheres free from the influence of the state if it is not to degenerate into the worst kind of despotism, so the market system, too, must allow spheres free from the influence of the market if it is not to become intolerable; there must be the sphere of communal life and altruistic devotion, the sphere of self-sufficiency, the sphere of small and simple living conditions, the sphere of the state and of planned economy.

(*Ibid.*, p. 119)

Economic cycles and crises are part of the frictional loss under conditions of capitalist production. They can also be caused by a malfunctioning of the monetary and credit system or a state administration which degenerates into a plaything of interests. In order to set limits to the demands for a welfare state, Röpke recommends the 'cultivation of the local sphere' (*ibid.*, p. 133).⁵⁰

Röpke next sorts out the idea of an approaching end of the capitalist market economy, which was typical of the time. He does not, for instance, expect high levels of unemployment and a depression after the war, because he believes in the positive effect that reconstruction would have on employment.

The positive programme set out by Röpke in the second part of the book contains little in the way of concrete recommendations for action, a fact already

criticised in reviews at the time. However, the following principle, after all, constitutes a clear regulative principle:

The incompatible character of an intervention is revealed when, by paralysing the price mechanism, it creates a situation which immediately calls for further and even greater intervention, transferring the regulating function so far carried out by the market to a government agency.

(Ibid., p. 161)

Social 'assistance' is incompatible if it destroys 'the secret spring of a healthy society, i.e. the sense of responsibility' (ibid., p. 164).⁵¹

Röpke considers properly executed social security indispensable, and he is also not opposed to pursuing a policy of full employment. Rather, he says, he was relieved when, in the spring of 1933, Roosevelt introduced such a policy in the form of the 'New Deal', except for the fact that the wrong measures were introduced: a 'devaluation which damaged the economies of the rest of the world' [my transl.; German edition: p. 263], a hesitant implementation of an effective expansion policy, artificial wage and price boosts, and production regulation (Röpke 1950 [1942], p. 169), where what would have been called for was '... an extensive programme of public investment, farming and unemployment subsidies, special incentives for new private investments, scaling down of taxation of enterprises and production ...' (ibid., pp. 168f.).

As a result of the mistakes that were made regarding regulatory policies, one was faced with '... an economy which through planning and monopolies had become lethargic and almost impossible to operate' (ibid., p. 169).

Instead of exercising self-criticism, there was talk about disappearing investment opportunities. Between the thesis of the Keynesians that only even greater expenditure, such as the war would later bring with it, made it possible to get out of the depression, and Schumpeter's suggestion that first a new technological boost had to appear, Röpke takes a peculiar middle position.

Would the proletariat disappear, and would a country that has lost its peasants and craftsmen get them back, if the 'comprehensive economic freedom' Röpke demands became a reality? (Ibid., p. 177) The question is similar to the one that arises in the transition economies today. Röpke is far more cautious in approaching an answer than those American liberals who, in 1991, promised with aplomb that Eastern Europe would quickly catch up on economic development through radical privatisation. Röpke alternates between pulling back the reins on his optimism and practicing sceptical social criticism, and giving it free rein again and hoping to be able to strengthen medium-sized enterprises as the pillars of a market economy through development planning, retraining, and credits.

Röpke turns to the peasants:

A peasant who is unburdened by debt and has an adequate holding is the freest and most independent man among us; neither food problems nor the threat of unemployment need worry him and the subjections to the moods

of nature which he exchanges for that of the market and the business cycle usually ennobles a man instead of embittering him.

(Ibid., p. 203)

And finally Röpke discusses the family as the basis of the whole edifice, juxtaposing the family in the city, 'which has been degraded to a mere consumption co-operative', with the rural family, 'which gives each member a productive function and thus becomes a community for life, solving all problems of education and age groups in a natural manner; . . .' (ibid., p. 203).

Part of the de-proletarianisation is the promotion of cottage industries, the introduction of different rhythms of work, and incentives for the crafts – the cobblers are meant to make better shoes than those provided by mass production, and the consumers are meant to learn to appreciate such superior products. They are to be educated so that they can see through the advertising practices of monopolists. In this way, the production of medium-sized enterprises is finally made possible by an attitude to life that is appropriate to it.

Any country that puts into practice the principles of a market economy needs to embed this within a corporate order of the world, which counteracts the formation of empires. Large coherent economic spaces do not solve the problems of reconstructing a worldwide economy. Even in the international context, the only politically neutral option for the economy is the market. Röpke therefore demands ' . . . a return to a liberal and multilateral form of world trade with tolerable tariffs, most-favoured-nation clauses, the policy of the open door, the gold standard, and the elimination of closed compulsory blocks . . .' (ibid., p. 242).

A federal worldwide community of states, however, is not conceivable 'without the leadership of a dominant group of nations', each of which follows the principles of the 'Third Way'. Finally, at the end of the book, Röpke commits himself firmly to 'gold as a lasting element of a genuine world economy' [my transl., German edition, p. 395].

Every now and again, complaints are voiced that in the Anglo-Saxon countries, the German ordoliberal thinkers did not find the recognition they deserved. The opportunity for such recognition was certainly there. Eucken's *magnum opus*, the *Grundlagen*, was translated into English (Eucken 1950 [1940]), and several books by Röpke appeared in English. The *Gesellschaftskrisis* was published as *The Social Crisis of Our Time* in 1950, but the German edition had been reviewed in leading journals before then, and thus it had been read. Old liberalism, new Keynesianism, and national differences in thinking about the economy fed into a critique of Röpke, which was, however, informed by respect for him. The review in *Economica* begins: 'This is a book to warm the heart of the student of Society' (Shenfield [1944], p. 151). After a short summary of Röpke's theses, the reviewer observes,

However, his program includes something which the English liberal instinctively thinks of as superstition – the re-establishment of a strong peasant and small craftsman class. It requires a real effort for the English liberal to

give this idea fair consideration, for historically he has always seen it in other men's camps, wrapped in some romantic anti-liberal clothing.

(Ibid., 151)

This is followed by the remark that a conservative liberalism would need to be based on social strata that support him, but that these strata are different ones in England, and finally the idea is kindly aired whether it might be possible that even English liberal conservatism will one day be in need such support again.

Other reviewers were more unequivocal in their criticism. H. W. Singer felt that Röpke's 'cult of the small' was far too idyllic, and Röpke's alleged discovery that the Swiss really follow this cult, he compared to Rousseau's discovery of the noble savage (Singer 1943, p. 235). And apart from all of that, he adds, Röpke was closer to the uncompromising liberalism of a Hayek or a Robbins than to the 'Middle Way' of a Keynes or a Macmillan. Although F. A. Fetter, in the *Journal of Political Economy*, admired Röpke's 'wide scholarship, . . . ingenious analogies and . . . descriptive terms' (Fetter 1943, p. 266) and appreciated the book as the work of a true welfare economist who is interested in human values, he nevertheless detected 'a touch of romanticism and . . . an underestimate of the potential good in modern improved technology' in those parts of Röpke's programme where he is even more radical in his criticism than the liberal opponents of monopolistic practices in the United States. Along similar lines, K. Pribram, in the *American Economic Review*, asked where, outside of Switzerland and possibly Scandinavia, Röpke expected to find the countries 'that are ready and in a position to adjust their economic life to this programme' (Pribram 1944, p. 172).

In his review, Pribram also expressed his surprise over the fact that Röpke did not waste much time with a critique of National Socialism. The explanation for this might be that Röpke rightly foresaw that the NS ideology would quickly disappear with the victory of the Allies. Hence, he identified liberal socialism as his actual enemy, a position mentioned in H. W. Singer's review in the *Economic Journal* and which the Attlee government in Great Britain tried to put into practice after the war. In *The Moral Foundations of Civil Society*, a book which is presented as the sequel to *The Social Crisis* and which was published as early as 1944, Röpke undertook to prove the impossibility of a liberal socialism, i.e. to work out the contradiction between 'liberal' and 'socialist'. As this was the analytic task to be solved, he defended himself against the charge of writing in a purely popular and associative style: 'There are not many who know what agonies hide behind the so-called 'easy' style of an author, and what processes of intellectual maturation are required before a thought can find a clear and simple expression' (Röpke 1944).

He wanted to focus his critique on liberal socialism because, as he saw it, it was impossible to enter into discussions with those who wanted to establish a dictatorship, but one could discuss with those who hoped to combine collectivism in the economic system with a liberal state. Much of the book was inevitably a repetition of content from the previous one, but Röpke needed to find specific arguments against the idea of a Keynesian welfare state, which emerged in the Anglo-Saxon discussion. Röpke wanted to demonstrate that the preservation of full employment already became entangled in collectivism. After half a century

of full employment policies in the industrial countries of West, we have three answers at our disposal: Röpke was wrong, or, if he was right, then it was only possible to avoid collectivism because genuine full employment was achieved only temporarily, and most of the time there was actually over-employment and immigration or under-employment. Or, the third possibility, a catastrophic collapse of employment was always averted in the end, but at the cost of an intensity of interventions which borders on collectivism.⁵²

The contemporary reviewers did not yet have the benefit of that experience. In his review of *Civitas Humana for Economica*, A. G. B. Fisher assumed a reader who was familiar with the arguments in *The Social Crisis* (Fisher 1945). He defended the form of life of the metropolitan Englishman against Röpke's unreasonable demand to counter the agglomeration of people in large cities and wherever possible to revert this trend, to some extent. Did such policies not border on illiberalism themselves? Fisher opposed Röpke's charge that the state developed too much economic initiative by referring to the economic policies not of Great Britain, which, in that respect, was comparatively liberal, but of the British dominions Australia and New Zealand, whose economic development had required state-run enterprises – for instance, for the building of railways.

The review of G. Lovasy in the *American Economic Review* ended by saying: '... the question remains whether those exposed to unemployment and suffering from the lack of social security would actually prefer Dr Röpke's alternative to active employment and social security policies – even if these involve some sacrifice of "freedom"' (Lovasy 1944, p. 909).

Fifteen years later – at the height of the Cold War and the efforts at armament associated with it, in the final phase of German reconstruction and the high level of employment this brought with it, and in view of the material success of the social market economy – Röpke insisted on his basic idea: '*certum an, incertum quando*' (Röpke 1961 [1958], p. 36) – it was certain that his vision would be realised one day; the only uncertainty was *when* that would be.

His theme was still a self-responsibility that was threatened by mass society and the concentration of economic power. These threats began in the family and were strengthened by a change in the inner nature of man, who was facing a process of degeneration, leading to

... an intellectually homeless and morally shipwrecked human being whose capacity for genuine religious devotion and for maintaining traditional culture has been dissolved by progressive intellectualisation and a sharp consciousness, while he is looking for a substitute among the political and social ideologies of our time which are advocated with fanatic intolerance.

(Ibid., p. 30)

He turned against the popular misconception that a socialist-progressive front was responsible for the successes of the postwar economic policies. While it was true that in 1945, set within a Europe with a left-wing orientation, Switzerland had looked like an antiquated liberal relic from the museum of history, soon liberal policies had led to success, first in Belgium, then, thanks to Einaudi, in Italy,

and thanks to Erhard in Germany, whereas socialism in Great Britain lost face. The victory of the market economy was, however, already threatened anew by beginning inflationary tendencies, overly generous financial policies, the missing reform of taxation, obstacles to international capital movement, the increasing concentration of economic power, and the transition to an 'employee society': 'In many respects we are certainly better off, but in many other respects considerably poorer than the previous generation' (*ibid.*).

Now environmental destruction enters the scene, beginning with a reference to John Stuart Mill (1848), who wished that society may become stationary before taking up too much of nature's space (Mill 1988): 'What we have in mind is the almost uncanny force with which our modern industrial, urbanised, and mass civilisation is able to destroy beauty, dignity, harmony, and poesy wherever it arrives' (Röpke 1961 [1958], p. 123).

His liberal conception remains an indivisible totality. He had had the honour, he says, to enter into a controversy with the great Benedetto Croce, in which Röpke put forward the thesis: '... that every society in all its aspects and areas forms a unity, in which all parts are mutually dependent on each other and form a whole which we cannot arbitrarily put together' (*ibid.*, p. 159)

Croce, by contrast, wanted to divide the economic from the political order and thus abetted an illusion that was dangerous to the development in Italy. He opposed the alleged success of the welfare state with the argument that state-organised mass welfare is the 'prosthesis for a society crippled by proletarianism', and that the task was to make it dispensable. He objects to the pay-as-you-go pension system, saying

... it does not suffice to refer to the elementary proposition that, after all, the pension paid at any one time, in reality, has to be covered by current production. Rather ... : the volume of current production is ... determined by previous investments ... ,

(*ibid.*, p. 159)

and these investments are meant to be based on savings. The pay-as-you-go system is therefore problematic in two respects: for the individual, because of insufficient personal provisions, and for society, because of insufficient capital formation.

The largest part of the book, finally, is dedicated to the question of how to fight creeping inflation, which would accelerate in the majority of European countries in the decades to follow and appeared to be under control only at the end of the century. Röpke, however, thought that with increasing production, prices should actually fall (*ibid.*, p. 279). He ends with a critique of the technocratic attitude of economists, about which, today, we can only say that, alas, it has since substantially solidified. Röpke held against it: '... what is decisive in economic life is associated with things that are as complicated and non-mathematical as a love letter or a Christmas party' (*ibid.*, p. 369).

We cannot attempt a comprehensive critical evaluation of Röpke's oeuvre. Ordoliberal thinking has prevailed in the Maastricht Treaty, and the concentration

of economic power has proved to be unstoppable. Röpke's name is still known in the world – there is, for instance, an American institute named after him, and he is a point of reference for representatives of the neo-Austrian School – but he is not widely read.⁵³

There are several reasons for this. To a modern economist, his theoretical tools appear too simple, while his philosophical thought and historical knowledge exceed the bounds of the discipline. His temporal closeness still prevents us from understanding certain extreme aspects of his position as conditioned by his times. His revulsion towards monopolies and cartels was influenced by memories of the late Kaiserreich and the Weimar Republic, where powerful authoritarian positions, on one hand, and proletarianisation, on the other, emerged, both of which would appear objectionable from a liberal perspective, even without National Socialism. Given today's high wages, contestable markets, and a broad base of shared ownership, the concentration of economic power seems less objectionable now.

Regarding this question, Röpke's opponents were not just socialists. At the meeting of the Verein für Socialpolitik in Bad Kissingen in 1960, Edgar Salin had voiced his support for a stronger concentration in German industry, because otherwise it would not be able to compete in a unified Europe. And he recommended a managerial form of capitalism, in which the owners of capital pass the entrepreneurial role to a hierarchy of managers. Röpke had always thought himself to be an adversary of Salin, who was seven years his senior. In Salin's Festschrift, marking his seventieth birthday, he wrote,

... while I try to be a reliable friend (with some success, I hope), I have – and others have – long since discovered that I am an unreliable enemy ... really ... we should very much bear a grudge against each other, even hate each other's guts.

(Beckerath, a.o. 1962, pp. 28f.)

Salin had also emigrated to Switzerland (to be precise: after he had been appointed to a chair in Basle in 1927, he declined a prestigious offer from Germany that was made prior to 1933, because he anticipated the evil to come). And Salin was also, like Röpke, a *hommes de lettres*, maybe even more so – his posthumous fame rests on his books on Stefan George, Burckhardt, and Nietzsche, as much as on economic activities and works. But he was an old liberal who thought in terms of power positions and was a supporter of nuclear power. Röpke was neo-liberal, and at least one slogan of the ecological movement was apt for him: 'Small is beautiful' (Schumacher 1973).

Salin was one of those who in 1971 impressed on us in his seminar: 'Today, Keynes would not be a Keynesian'. But what he meant was that after the old liberalism had in many ways exhausted itself, what was needed were additional institutions. And in his view, the ordoliberal diet was not rich enough in this regard. Thus, there was a quarrel going on between the city-states of Basle and Geneva, and yet they invited each other to present lectures.

Röpke's support of peasant family economies was not as utopian around the middle of the twentieth century as it may appear by now. Today, the scientific discussion of environmental problems has moved away from the description of cultural landscapes, with their social, settlement, and family structures, and has become an area for applied biology, environmental chemistry, and environmental physics. All is well with the environment if the diversity of species increases and environmental toxins decrease. Given the industrialisation of agriculture, an environmental expert is not necessarily a friend of modern farmers. It is possible that Röpke would have joined the environmental movement of the 1980s in its demand for ecological farming, practiced by environmentally conscious city-dwellers who return to the countryside and are supported by a negative income tax or similar means (Meyer-Abich and Schefold 1981). Nevertheless, he had peasant family economies in mind. Hermann Priebe has described the structural transformation that took place in German rural areas since 1945 and tried to design a programme for an ecologically sensible agriculture, supported by secondary income (Priebe 1982). In a modern village, there are only very few farmers, but many combine agriculture with other professions, and this at least prevents a rural exodus.

An environmental economist, when looking back in time, does not distinguish between 'then' and 'now', but between 'Medieval', 'modern peasant', and 'industrialized' agriculture (Hampicke 1991, my transl.). The productivity of Medieval agriculture was low; at the most, it was able to support a fifth of the population living in Germany today. The human impact on the environment led to greater ecological richness:

The clearing of forests and creation of a highly diverse spectrum of open land and succession habitats, in combination with the removal of nutrients from the soil over large areas of land, allowed light-demanding, often non-competitive, plants to spread . . . for the purpose of environmental protection it is very important to know that many of today's biotopes worth protecting are insular relics of mediaeval semi-cultivated landscapes, as in the case of almost all oligotrophic grassland.

(Ibid., pp. 250f., my transl.)

Preservation of such areas requires the continuation of the use – as, for instance, sheep pasture. Between the mid-eighteenth century and the mid-twentieth century, modern peasant agriculture regenerated the over-exploited forests and improved farming (von Thünen 1986). Through better fertilisation, including the cultivation of leguminous crops for nitrogen fertilization; through the use of horses, instead of ox for ploughing; and by other means, productivity was raised, while keeping free spaces for a mixture of habitats. This is the period of which Röpke is thinking when he gives his optimistic evaluations of the effects of traditional agriculture, which achieved significant labour savings with the help of simple machines and without damaging the soil by the use of heavy machinery or fostering the development of monocultures. These effects, however, were brought

about by industrialised agriculture and its use of chemical fertilisers and pesticides, with the farmer now sitting in front of the television in the evening and more and more often becoming a part-time farmer.

In many places, but especially in Switzerland, pockets of old peasant culture were preserved for a long time. Today, they appear small and threatened, but at the time of my childhood they still seemed strong and capable of asserting themselves. At the time of the campaigns in Poland, France, Norway, Africa, and Russia, when Röpke was writing *The Social Crisis*, Switzerland's hopes did not rest on fraudulent financial arrangements with German or Italian rulers or on providing the Allies with opportunities for espionage. Such things may have been helpful, and, of course, National Socialists also existed in Switzerland, as well as traitors who were prepared to take on the role of quislings, if need be. What is crucial for historical judgement is the fact that these succumbed because what Röpke was talking about actually existed: the democratic tradition in the cities and, most of all, the steadfast peasants. One can still see them on photographs: harvesters of wild hay underneath enormous bundles of dried grass, walking along slim paths in the mountains, close to a precipice; village women who open and close the tiny sluices of the narrow irrigation canals which have been dug under great efforts on the slopes; the rural communities, then the rural crafts, cobblers sewing military boots, tanners, weavers, ropers, wainwrights – all professions whose century-old traditions have almost completely disappeared.⁵⁴ Apart from the modest peasantry in the mountains, there was a more affluent one in the central plateau, which was economically much more important. However, here the harmony between natural forms of production, rural community, and local democracy was threatened first.

The means, though, by which Switzerland supported peasants and craftsmen did not at all conform purely to ordoliberal principles. When the state gave contracts to saddlers and cobblers, it was rarely asked whether the industry could produce the same goods cheaper, possibly by using synthetic material, instead of leather. What mattered was to preserve the professions as forms of life. Peasant production was supported by guaranteeing prices. In the long run, subventions which ran counter to the economic system could not be maintained. But the generation following that of Röpke was still able to enjoy the stability of tradition. Today, there are attempts at supporting agriculture in the form of landscape gardening.

Röpke's recommendations seem visionary, and yet they are based on concrete experiences of his time. His merit is not to have established a detailed catalogue of measures that conform to the ordoliberal system, but in establishing a connection between the principles of his anthropology, his social vision, and economic measures. The postulate according to which economic policies are principally to be judged with respect to all three of these dimensions should remain indisputably valid in its general form, whereas individual judgements are more difficult to make because the standards of tradition lose their validity, and a utilitarian perspective will nevertheless not be able to replace them entirely. New perspectives on how to arrange human affairs can only be opened up by individuals who, like Röpke, combine knowledge, judgement, and experience with the courage of personal commitment to a cause in a form that is relevant to the times.

Notes

- 1 E.g. *The New Palgrave: A Dictionary of Economics* (1987) contains the following entries: 'Wicksell, Johan Gustav Knut (1851–1926)' (Uhr 1987); 'Wicksell and Neoclassical economics' (Samuelson 1987); other important entries are on 'Wicksell effects' (Burmeister 1987), on 'Wicksell's theory of capital' (Pivetti 1987), and on the 'Cumulative processes' (Hansson 1987).
- 2 Cf. on this: also the acknowledgement of Blankart (1995).
- 3 Cf. on this: the review by Sanger (1898).
- 4 Cf. on this: Blaug (1992, introduction).
- 5 Cf. on this: Uhr (1960, pp. 10–15).
- 6 Joan Robinson suggested the following interpretation of the 'natural interest rate': 'Wicksell similarly distinguishes between the "natural rate of interest", which means the rate of profit, and the "money rate of interest", which is the cost of borrowing' (Robinson 1971, p. 28). In 1939, she classified natural interest according to the marginal efficiency of capital (cf. Robinson 1966b, p. 78). She viewed the notion of a full employment interest rate with scepticism: 'Far more important is the fact that the maintenance of full employment requires a sufficient urge to keep investment going, and that the influence of the rate of interest (even if it were managed with the greatest possible skill and wisdom by the monetary authorities) is not strong enough to govern the rate of investment when that urge is lacking' (Robinson 1969 [1965, 1956], p. 398).
- 7 On the real balance effect, cf. e.g. Lybeck (1994 [1974]).
- 8 Stackelberg's works are cited from the original edition. His works are collected in Stackelberg (1992). Citations from this volume will be added in brackets, after the brief citation, if the work appears in this collection.
- 9 Cf. Tirole (1990).
- 10 The critique which Eucken is responding to is presented in Stackelberg's essay '*Möglichkeiten und Grenzen der Wirtschaftslenkung*' (1949 [pp. 1007–20]).
- 11 Cf. Möller (1949).
- 12 See, for example, the view of O. Weinberger (Stackelberg 1930). Or the critical essay on G. Cassel (Stackelberg 1933) or the review of the translation of A. L. Bowley (Stackelberg 1936a).
- 13 Cf. 'Increasing returns, competition, and growth', in the present volume, pp. 244–260
- 14 Cf. Stackelberg (1992, p. 185 sq.).
- 15 A geometrical illustration of a duopoly constellation corresponding to our own can be found in Stackelberg (1934, p. 49 [p. 241]), case $\alpha\alpha$. For the mirror image of that, forming an opposite case $\beta\beta$ (*ibid.*, p. 50 [p. 242]), is put in an appendix by Stackelberg with a numerical example (as case IX.3 in (*ibid.*, p. 126 [p. 318])). There the unique situation arises that for the first supplier, the independence of the second promises the greater profit, which is only realizable for Stackelberg when the first 'voluntarily' submits to dependence on the second: (*ibid.*, p. 129 [p. 321]).
- 16 Niehans has pointed out a strange omission (Niehans 1992, p. 194).
- 17 'Since if they were to seek the greatest revenue, on the basis of collusion, the results will be quite different, and would not differ for the consumer from those obtained in the case of monopoly' (my transl.).
- 18 Chamberlin is speaking here of additional income, which, with minor exceptions, allows the result to be clearly determined: 'It is indeterminate only in so far as the best choice between these assumptions is doubt' (Chamberlin 1929, p. 91).
- 19 B. Schefold, 'Max Weber's *Protestant Ethic* as an inquiry into economics', in Schefold (2016c, pp. 320–39).
- 20 That Eucken's definition of market forms constitutes a critique of Stackelberg is mentioned on p. 124.
- 21 The question which arises here about Stackelberg's relation to National Socialism has been dealt with by H. Möller in the introduction to Stackelberg (1992). In the

Archiv für mathematische Wirtschafts- und Sozialforschung, a publication in which Stackelberg collaborated, there is a programmatic 'Introduction to the First Meeting of the Community of Supporters of Mathematical Economic and Social Research' from Minister President Dietrich Klagges, in which (even only in the short term!) the advantage of protectionism for employment is presented, and there is a call for mathematically oriented economics to adopt, and give more than lip-service to, 'the expressions of the National Socialist world view.' It is necessary to deal with 'the major problems which are thrown up by the new economic organizational will of the Third Reich,' Klagges (1936, p. 55, my transl.). Even if the young Stackelberg does not appear to have been involved in an instrumentalization of mathematical economics in this sense – the violence particular to National Socialism is based on a use of technology which stood in a particular tense relationship with conservative ideals of an orientation to nature – and even if Stackelberg was liberal to the extent that the validity of the theory of perfect competition was sufficient, he oriented himself toward Fascist or National Socialist ideas, where the theory became vulnerable. Traces of this orientation are still to be found in his textbook, which is a masterpiece on account of its 'cosmopolitan scholarship and its scientific up-to-dateness' (Niehans 1992, p. 202), although it was written in the middle of a war. Stackelberg, as student and scientist at the beginning of his career, discussed positions of National Socialist economic policy that went even further. Cf. on that, the early essays in '*Jungnationale Stimmen*' (Stackelberg 1932a, 1932b, 1932c) on German economic autarky or on the popular biology, as well as the clear rejection of liberalism in his review of a book by Haberler (Stackelberg 1936b). All of the essays, even the early ones, are characterized by remarkable scientific skill.

- 22 Cf. also the essay collection from Langlois (1986a).
- 23 According to Fisher (1987, p. 235).
- 24 Cf. Samuelson (1966b), as well as Wood and Woods (1989).
- 25 Review in Schneider (1949), my transl.
- 26 Cf. Schefold (1997e, chapter 18).
- 27 An example of this would be the numerous references to the economies of scale debate associated with names such as Clapham, Sraffa, Pigou, and others in the *Economic Journal*, in which chapter 4, 'A comprehensive restatement of the theory of cost and production' (Samuelson 1975), implicitly refers in part to the concluding analytical explanations and in part to the lively and polemical positions taken. It also alludes to the question of whether it really is the case that according to marginal productivity theory, the product is exhausted by factor incomes only with linear homogeneous production functions; many other aspects of Marshallian analysis are discussed.
- 28 After examining Hicks's papers and the related texts, Ingrao and Israel have come to the conclusion that the origin of the notion of temporary equilibria is to be found in Myrdal, Hicks learned from Lindahl how to relate them, and the intertemporal equilibrium came from Hayek. Cf. Ingrao and Israel (1990, pp. 226, 233).
- 29 Hicks accused Hayek of ascribing disruptions of an intertemporal equilibrium exclusively to monetary factors – a view which has remained characteristic in Monetarism (*ibid.*, p. 234).
- 30 Cf. Garegnani (1976).
- 31 In *A Theory of Economic History* (Hicks 1969), he attempted to sketch the contribution which can be made by the economist well-versed in theory and history in explaining the great lines of historical economic development. Anthony Courakis, one of Hicks's students, organized a conference in Delphi in the same spirit, at which ancient historians, students, and friends of Hicks, together with some economists, discussed the applicability of modern economic models to the ancient economy. Cf. Schefold (1994b).
- 32 The book was submitted to the publisher in 1946 and is therefore often referred to in the literature as a book from the year 1946, a year in itself of some significance.
- 33 Cf. C. Watrin (1980, p. 19) and Kowitz (1998).

- 34 This quotation, as well as all other quotes taken from Müller-Armack's writings, were translated by the author.
- 35 Many books could be referred to which deal with Max Weber primarily as an economist and with Sombart and his contemporaries; cf. also: Nörr, Schefold, and Tenbruck (1994); and Acham, Nörr, and Schefold (eds) (1998).
- 36 'Knut Wicksell, *Interest and Prices*', present volume, pp. 325–332
- 37 He does not believe imperialism to be a necessary symptom of modern capitalist development, but he does not, like Schumpeter, merely ascribe it to the resilience of feudal strata.
- 38 Müller-Armack was exonerated during the denazification process. As a full professor in Münster, he gave employment to religiously involved colleagues, who as such had a difficult position under the regime. Higher authorities criticized the 'liberal attitude' which was 'quite evident' in his lectures. After 1933, he must have quickly lost enthusiasm; he therefore manoeuvred, without exposing himself (cf. Kowitz 1998, pp. 60–85).
- 39 We do not know for certain whether Müller-Armack created this phrase himself. According to anecdotal evidence, it was first used by a secretary as a name for the archiving of a group of files (cf. Schmidt-Klingeberg 1997, p. 97).
- 40 [Transl. note]: The German title of Erhard's book (Erhard 1957) differs significantly from that of the English translation. It is *Wohlstand für alle*, i.e. *Prosperity for All*.
- 41 [Transl. note]: The text is, according to its subtitle, a three-volume 'universal history' which presents a 'critique of civilisation' (Rüstow 2003 [1950]). The three volumes are titled *Ursprung der Herrschaft* [The Origins of Domination], *Weg der Freiheit* [The Path of Freedom], and *Herrschaft oder Freiheit?* [Domination versus Freedom?]. The abbreviated English translation, as the editor points out, makes no attempt 'to translate the German title, which literally could be rendered as "Taking Bearings on the Present"' (p. x): Alexander Rüstow (1980) *Freedom and Domination. A Historical Critique of Civilization*, Dankwart A. Rüstow (ed.), transl. by Salvator Attanasio, Princeton, New Jersey: Princeton University Press.
- 42 See Röpke (1961 [1958], p. 17).
- 43 Röpke hated the brutality of war and at first was inclined to blame capitalist imperialism as its cause. However, under the influence of the work of Ludwig von Mises, he left his socialist tendencies behind.
- 44 He followed an offer of a chair at the University of Istanbul. Fritz Neumark (1980) has described the 'refuge at the Bosphorus', which attracted a considerable number of German scholars who had been invited by the government of Atatürk, in order to support the modernisation of the Turkish University system.
- 45 Published in English as *Economics of the Free Society*. See Röpke (1963).
- 46 [Transl. note:] Röpke's *Crises and Cycles* (1936) is partly based on, but not identical to, *Krise und Konjunktur* (1932).
- 47 [Transl. note:] The German expression is '*Stadium der "Reinigung"*'. In *Crises and Cycles*, Röpke's term '*Reinigung*' is very literally translated as 'cleaning up'.
- 48 [Transl. note:] The German term is '*Rücksichtslosigkeit*', which could also be rendered as 'ruthlessness' or 'selfishness'.
- 49 Röpke considered the French Revolution a mistake that could have been avoided, and Jefferson, the author of the Declaration of Human Rights and the third president of the United States (but the American envoy in Paris at the time of the revolution) agreed with him. See Jefferson (no year, pp. 109–11).
- 50 [Transl. note:] The German is '*Pflanzland hinter dem Haus*', 'garden patch behind the house'. However, within the context of the passage, this refers not only to growing one's own produce, but also to a localised economy, as opposed to abstract competition in abstract markets.
- 51 [Transl. note:] '*das Gefühl der Selbstverantwortung*' = 'the feeling of self-responsibility'.
- 52 The second of these possibilities appears most likely the right one to me – B.S.
- 53 In Steubenville, Ohio.
- 54 Brunner (1995). See also Schefold (1996d).

**Appendix: The Series *Klassiker
der Nationalökonomie***

<i>First publication (Publication of reprint and commentary volume)</i>	<i>Author and Work (Bold font entries indicate translated commentary by B. Schefold in the present edition)</i>	<i>Reproduction</i>	<i>Title of commentary volume: Vademecum . . .</i>	<i>Authors (pp.)</i>
369–354 BC 1734 (1998)	XENOPHON, OIKONOMIKOS ODER XENOPHON VOM HAUS-WESEN	Facsimile reprint of the bilingual edition of 1734 (published in Hamburg)	. . . zu einem Klassiker der Haushaltsökonomie	B. Schefold, K. Schefold, S. T. Lowry, and A. Schmitt (198 pp.)
335–23 BC 1879 (1992)	ARISTOTELES, POLITIK	Facsimile reprint of the edition published in 1879 by Franz Susemihl in Leipzig	. . . zu einem Klassiker des antiken Wirtschaftsdenkens	H. Flashar, O. Issing, S. T. Lowry, and B. Schefold (180 pp.)
81 BC 1501 (2002)	HUAN KUAN, YANTIE LUN. DIE DEBATTE ÜBER SALZ UND EISEN	Facsimile reprint of the edition of 1501 (Hongzhi)	. . . zu dem Klassiker der chinesischen Wirtschaftsdebatten	E. v. Mende, B. Schefold, H. U. Vogel, and partial translation of Kuan by S. Ludwig with annotations by E. v. Mende (195 pp.)
44 BC 1465 (2001)	MARCUS TULLIUS CICERO, DE OFFICIIS	Facsimile reprint of the <i>Editio Princeps</i> , published in Mainz 1465	. . . zu einem Klassiker des römischen Denkens über Staat und Wirtschaft	H. Kloft, W. Rüegg, B. Schefold, and G. Vivenza (164 pp.)
1356–77 1485 (1995)	NICOLAUS ORESMIUS, TRACTATUS DE ORGINE ET NATURA, IURE & MUTATIONIBUS MONETARUM	Facsimile reprint of an illuminated manuscript of 1485	. . . zu einem Klassiker der mittelalterlichen Geldlehre	F. Avril, O. Langholm, D. Lindenlaub, B. Schefold, H. Tietmeyer, and translation of Oresmius by E. Schorer, with notes by B. Schefold (220 pp.)

1267–73 1496 (1991)	THOMAS VON AQUIN, ÖKONOMIE, POLITIK UND ETHIK AUS 'SUMMA THEOLOGIAE'	Facsimile reprint (extracts) of the edition printed by Anton Koberger in 1496	... zu einem <i>Klassiker der Wirtschaftsethik</i>	P. Koslowski, N. Lobkowitz, H. C. Recktenwald, H. Thurn, E. A. Synan, and A. F. Utz (86 pp.)
1401 (2000)	IBN KHALDUN, ÖKONOMIE AUS MUQADDIMA	Facsimile reprint (partial) of the manuscript written in 1401/02	... zu dem <i>Klassiker des arabischen Wirtschaftsdenkens</i>	H. Daiber, Y. Essid, A. Hottinger, B. Schefold, and partial translation of Khalidun by A. Schimmel and M. Pätzold (184 pp.)
1524 (1987)	MARTIN LUTHER, VON KAUFFSHANDLUNG UND WUCHER	Facsimile reprint of the first edition, published by Hans Lufft at Wittenberg	... zu einem <i>frühen Klassiker der ökonomischen Wissenschaft</i>	H. Hesse and G. Müller (103 pp.)
1530, 1530, 1548 (2000)	DIE DREI FLUGSCHRIFTEN ÜBER DEN MÜNZSTREIT DER SÄCHSISCHEN ALBERTINER UND ERNESTINER	Facsimile reprints of 'Gemeyne stimmen von der Muntz', 'Die Müntz Belangende. Antwort und bericht', and 'Gemeine Sbynnen Von der Müntze: Apologia ... und vorantwortung'	... zu drei <i>klassischen Schriften frühneuzeitlicher Münzpolitik</i>	K. H. Kaufhold, M. North, C. Perrotta, and B. Schefold (174 pp.)

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1556 + 1558 (1998)	MARTIN DE AZPILCUETA, COMENTARIO RESOLUTORIO DE CAMBIOS; LUIS ORTIZ, MEMORIAL DEL CONTADOR LUIZ ORTIZ A FELIPE II	Facsimile reprint of the first edition of <i>Azpilcueta</i> and facsimile of the manuscript copy of Ortiz	. . . <i>zu zwei Klassikern des spanischen Wirtschaftsdenkens</i>	M. Grice-Hutchinson, E. Luch, B. Scheffold, and partial translation of Ortiz by A. Ixmeier (200 pp.)
1605 (1999)	LEONARDUS LESSIUS, ÖKONOMIE UND ETHIK AUS 'DE IUSTITIA ET IURE'	Facsimile reprint of the first edition, published in Leuven	. . . <i>zu einem Klassiker der spätscholastischen Wirtschaftsanalyse</i>	L. Baeck, B. Gordon, T. v. Houdt, and B. Scheffold (160 pp.)
1613 (1994)	ANTONIO SERRA, <i>BREVE TRATTATO DELLE CAUSE, CHE POSSONO FAR ABBONDARE LI REGNI D'ORO & ARGENTO</i>	Facsimile reprint of the first edition, published in Napoli	. . . <i>zu einem unbekanntem Klassiker</i>	A. Heertje, C. Poni, R. R. Portioli, A. Roncaglia, and B. Scheffold (136 pp.)
1651 (1990)	THOMAS HOBBS, <i>LEVIATHAN</i>	Facsimile reprint of the first edition, published in London	. . . <i>zu einem Klassiker der Geistes- und Naturwissenschaft</i>	H. C. Reectenwald, J. Aubrey, H. Maier, and L. S. Moss (79 pp.)
1664 (1989)	THOMAS MUN, <i>ENGLAND'S TREASURE BY FORRAIGN TRADE</i>	Facsimile reprint of the first edition, published in London	. . . <i>zu einem frühen Merkantilisten</i>	H. C. Reectenwald, F. Gehrels, and C. P. Kindleberger (108 pp.)
1668 (1990)	JOHANN JOACHIM BECHER, <i>POLITISCHER DISCURS</i>	Facsimile reprint of the first edition, published in Frankfurt	. . . <i>zu einem universellen merkantilistischen Klassiker</i>	J. Klaus and J. Starbatty (120 pp.)

1675 (1993)	JACQUES SAVARY, <i>LE PAREFAIT NEGOCIANT</i>	Facsimile reprint of the first edition, published in Paris	... zu einem Klassiker der <i>Handlungswissenschaft</i>	J.-F. Fitou, E. le Roy Ladurie, B. Scheffold, and D. Schneider (112 pp.)
1684 (1997)	PHILIPP WILHELM VON HÖRNIGK, <i>OESTERREICH ÜBER ALLES, WANN ES NUR WILL</i>	Facsimile reprint of the first edition	... zu einem Klassiker <i>absolutistischer Wirtschaftspolitik</i>	B. Scheffold, H. Matis, M. Streissler, E. W. Streissler, and K. Tribe (336 pp.)
1690 (1992)	WILLIAM PETTY, <i>POLITICAL ARITHMETICK</i>	Facsimile reprint of the first edition, published in London	... zu einem Klassiker <i>der angewandten Nationalökonomie</i>	T. Aspromourgos, A. W. Coats, D. P. O'Brien, and B. Scheffold (144 pp.)
1692 (1993)	JOHN LOCKE, <i>SOME CONSIDERATIONS OF THE CONSEQUENCES OF THE LOWERING OF INTEREST, AND RAISING THE VALUE OF MONEY</i>	Facsimile reprint of the first edition, published in London	... zu einem Klassiker <i>der merkantilistischen Geldtheorie</i>	H. C. Binswanger, W. Eltis, B. Scheffold, and K. I. Vaughn (192 pp.)
1697 (1996)	PIERRE DE BOISGUILBERT, <i>LE DÉTAIL DE LA FRANCE. SOUS LE RÈGNE DE LOUIS XIV</i>	Facsimile reprint of the edition published in Rouen	... zu dem Kolumbus der <i>Nationalökonomie</i>	A. Heertje, G. Faccarello, P. D. Groenewegen, and J. Hecht (312 pp.)
1735–37 (1999)	GEORGE BERKLEY, <i>THE QUERIST</i>	Facsimile reprint of the first edition, published in three parts between 1735 and 1737 in Dublin	... zu einem irischen <i>Klassiker der politischen Ökonomie</i>	A. Heertje, C. G. Caffentzis, S. Rashid, and K.-H. Schmidt (184 pp.)
1714 (1990)	BERNARD DE MANDEVILLE, <i>THE FABLE OF THE BEES</i>	Facsimile reprint of the first edition, published in London	... zu einem klassischen <i>Literaten der Ökonomie und Ethik</i>	H. C. Recktenwald, M. Perlman, F. B. Kaye, and F. A. v. Hayek (138 pp.)

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1741 (2001)	JOHANN PETER SÜSSMILCH, DIE GÖTTLICHE ORDNUNG	Facsimile reprint of the first edition, published in Berlin	. . . zu dem deutschen Klassiker der Bevölkerungswissenschaft	H. Hax, H. Birg, E. Elsner, and J. Hecht (215 pp.)
1750 (1986)	FERDINANDO GALLIANI, DELLA MONETA	Facsimile reprint of the first edition, published in Napoli	. . . zu einem frühen Klassiker der ökonomischen Wissenschaft	P. Dongli, L. Einaudi, and E. Ganzoni (66 pp.)
1752 (1987)	DAVID HUME, POLITICAL DISCOURSES	Facsimile reprint of the first edition, published in Edinburgh	. . . zu einem frühen Klassiker der ökonomischen Wissenschaft	A. Peacock and E. Topitsch (116 pp.)
1755 (1987)	RICHARD CANTILLON, ESSAI SUR LA NATURE DU COMMERCE EN GÉNÉRAL	Facsimile reprint of the first edition, published in London	. . . zu einem frühen Klassiker der ökonomischen Wissenschaft	J. Niehans (52 pp.)
1756 (1993)	J. H. G. VON JUSTI, GRUNDSÄTZE DER POLICEY-WISSENSCHAFT	Facsimile reprint of the first edition, published in Göttingen	. . . zu einem Klassiker des Kameralismus	H. Rieter, B. Schefold, K. Tribe, and J. Wysocki (172 pp.)
1759 (1986)	ADAM SMITH, THE THEORY OF MORAL SENTIMENTS	Facsimile reprint of the first edition, published in London and Edinburgh	. . . zu einem frühen Klassiker der ökonomischen Wissenschaft	H. C. Recktenwald (106 pp.)

1763 (2002)	VICTOR RIQUETTI MARQUIS DE MIRABEAU & FRANÇOIS QUESNAY, <i>PHILOSOPHIE RURALE</i>	Facsimile reprint of the first edition, published in Amsterdam	... zu einem Klassiker der <i>Physiokratie</i>	A. Heertje, J. Cartelier, W. A. Eltis, P. D. Groenewegen, and B. Schefold (152 pp.)
1767/68 (1987)	FRANÇOIS QUESNAY, <i>PHYSIOCRATIE</i>	Facsimile reprint of the edition published in two parts in Paris	... zu einem frühen Klassiker der ökonomischen Wissenschaft	W. Leontief and H. C. Recktenwald (72 pp.)
1767 (1993)	JAMES STEUART, <i>AN INQUIRY INTO THE PRINCIPLES OF POLITICAL OECONOMY</i>	Facsimile reprint of the first edition, published in two volumes in London	... zu einer klassischen <i>Synthese von Theorie, Geschichte und Politik</i>	T. W. Hutchison, D. A. Redman, B. Schefold, A. S. Skinner, and J. Starbatty (109 pp.)
1769/70 (1990)	A. R. JACQUES TURGOT, <i>RÉFLEXIONS SUR LA FORMATION ET LA DISTRIBUTION DES RICHESSES</i>	Facsimile reprint of the first edition, which appeared in the form of three successive articles in Paris	... zu einem Verfechter des aufklärten <i>Individualismus</i>	H. C. Recktenwald, C. Jessua, P. D. Groenewegen, A. Alcouffe, and J. Frayssé (141 pp.)
1771 (2000)	ISAAC DE PINTO, <i>TRAITÉ DE LA CIRCULATION ET DU CRÉDIT</i>	Facsimile reprint of the first edition, published in Amsterdam	... zu einem niederländischen <i>Pionier des Denkens über die Staatsverschuldung</i>	A. Heertje, A. E. Murphy, I. J. A. Nijenhuis, and K.-H. Schmidt (123 pp.)
1773–1789 (2001)	MIURA BAIEN, KAGEN. <i>VOM URSPRUNG DES WERTES</i>	Facsimile reprint of the manuscript (written between 1773 and 1789)	... zu einem japanischen Klassiker des ökonomischen Denkens	G. Distelrath, K. Dopfer, J. Kreiner, M. Komuro, B. Schefold, and translation of Baien by G. Distelrath (232 pp.)

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1798 (1986)	THOMAS ROBERT MALTHUS, AN ESSAY ON THE PRINCIPLE OF POPULATION	Facsimile reprint of the first edition, published in London	. . . zu einem frühen Klassiker der ökonomischen Wissenschaft	J. P. Henderson and W. J. Samuels (38 pp.)
1803 (1986)	JEAN-BAPTISTE SAY, TRAITÉ D'ÉCONOMIE POLITIQUE	Facsimile reprint of the first edition, published in Paris	. . . zu einem frühen Klassiker der ökonomischen Wissenschaft	H. C. Recktenwald and W. J. Baumol (58 pp.)
1815 (1996)	DIE 'CORN-LAW-PAMPHLETS' VON 1815 (TH. R. MALTHUS, E. WEST, R. TORRENS, and D. RICARDO)	Facsimile reprints of five first editions, published in London	. . . zu den Klassikern der Differentialrenten-Theorie	S. Hollander, L. Pasinetti, B. Schefold, and M. S. Skourtos (164 pp.)
1817 (1988)	DAVID RICARDO, ON THE PRINCIPLES OF POLITICAL ECONOMY AND TAXATION	Facsimile reprint of the first edition, published in London	. . . zu einem frühen Klassiker der ökonomischen Wissenschaft	K. J. Arrow, M. Ricardo, and H. C. Recktenwald (84 pp.)
1819 (1995)	JEAN CHARLES LEONARD SIMONDE DE SISMONDI, NOUVEAUX PRINCIPES D'ÉCONOMIE POLITIQUE	Facsimile reprint of the first edition, published in Paris	. . . zu einem Klassiker der Sozialökonomie	B. Schefold, A. Alcouffe, G. Eisermann, and P. Schiera (184 pp.)

1820 (1989)	THOMAS ROBERT MALTHUS, <i>PRINCIPLES OF POLITICAL ECONOMY</i>	Facsimile reprint of the first edition, published in London	... zu einem wegweisenden Klassiker der ökonomischen Wissenschaft	H. C. Recktenwald, J. M. Keynes, S. Rashid, J. P. Henderson, and W. J. Samuels (100 pp.)
1821 (1998)	CLAUDE-HENRI DE SAINT- SIMON, <i>DU SYSTÈME INDUSTRIEL</i>	Facsimile reprint of the first edition, published in two parts in Paris	... zu einem Klassiker des utopischen Sozialismus	A. Heertje, L. Bergeron, P. D. Groenewegen, and C. Jessua (123 pp.)
1826 (1986)	JOHANN HEINRICH VON THÜNEN, <i>DER ISOLIERTE STAAT</i>	Facsimile reprint of the first edition, published in Hamburg	... zu einem frühen Klassiker der ökonomischen Wissenschaft	H. C. Recktenwald and P. A. Samuelson (88 pp.)
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1832 (1992)	CHARLES BABBAGE, <i>ON THE ECONOMY OF MACHINERY AND MANUFACTURES</i>	Facsimile reprint of the first edition, published in London	... zu einem Klassiker der Arbeitsteilung	H. M. Enzensberger, H. Hax, N. Rosenberg, B. Scheffold, and K. Steinbuch (192 pp.)
1836 (2000)	NASSAU WILLIAM SENIOR, <i>AN OUTLINE OF THE SCIENCE OF POLITICAL ECONOMY</i>	Facsimile reprint of the first edition, published in London	... zu einem Klassiker der Verteilungstheorie	H. Hax, S. F. Frowen, T. W. Hutchison, and H.-M. Trautwein (95 pp.)
1838 (1991)	ANTOINE AUGUSTIN COURNOT, <i>RECHERCHES SUR LES PRINCIPES MATHÉMATIQUES DE LA THÉORIE DES RICHESSES</i>	Facsimile reprint of the first edition, published in Paris	... zu einem Klassiker der mathematischen Wirtschaftstheorie	A. Alcouffe, J. Frayssé, H. L. Moore, B. Scheffold, and W. G. Waffenschmidt (86 pp.)

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1841 (1989)	FRIEDRICH LIST, DAS NATIONALE SYSTEM DER POLITISCHEN OEKONOMIE	Facsimile reprint of the first edition, published in Stuttgart and Tübingen	. . . <i>zu einem schöpferischen Klassiker mit tragischem Schicksal</i>	H. C. Recktenwald, K. Häuser, W. Lachmann, and H. Scherf (152 pp.)
1844 (1997)	THOMAS TOOKE, AN INQUIRY INTO THE CURRENCY PRINCIPLE	Facsimile reprint of the first edition, published in London	. . . <i>zu einem Klassiker der Banking School</i>	A. Arnon, M. Pivetti, H. Rietter, and B. Schefold (174 pp.)
1848 (1988)	JOHN STUART MILL, PRINCIPLES OF POLITICAL ECONOMY	Facsimile reprint of the first edition, published in two volumes in London	. . . <i>zu einem frühen Klassiker der ökonomischen Wissenschaft</i>	H. C. Recktenwald and G. J. Stigler (92 pp.)
1848 (1998)	BRUNO HILDEBRAND, DIE NATIONALÖKONOMIE DER GEGENWART UND ZUKUNFT	Facsimile reprint of the first edition, published in Frankfurt	. . . <i>zu einem Klassiker der Stufenlehre</i>	G. Eisermann, V. Gioia, T. Pierenkemper, E. Rothschild, and B. Schefold (288 pp.)
1854 (1987)	HERMANN HEINRICH GOSSEN, ENTWICKELUNG DER GESETZE DES MENSCHLICHEN VERKEHRS	Facsimile reprint of the first edition, published in Braunschweig	. . . <i>zu einem verkannten Klassiker der ökonomischen Wissenschaft</i>	W. Krelle and H. C. Recktenwald (72 pp.)
1860 (1998)	LORENZ VON STEIN, LEHRBUCH DER FINANZWISSENSCHAFT	Facsimile reprint of the first edition, published in Leipzig	. . . <i>zu einem Klassiker der Staatswissenschaft</i>	H. Hax, H. Grossektler, M. Heilmann, S. Koslowski, and T. Shibata (200 pp.)

1861 (1994)	WILHELM ROSCHER, ANSICHTEN DER VOLKSWIRTSCHAFT AUS DEM GESCHICHTLICHEN STANDPUNKTE	Facsimile reprint of the first edition, published in Leipzig and Heidelberg	... zu einem Klassiker der <i>historischen Schule</i>	B. Schefold, E. W. Streissler, F. Baltzarek, K. Milford, and P. Rosner (212 pp.)
1863 (1995)	HANS V. MANGOLDT, GRUNDRISS DER VOLKSWIRTSCHAFTSLEHRE	Facsimile reprint of the first edition, published in Stuttgart	... zu einem frühen <i>Klassiker der Preistheorie</i>	B. Schefold, P. D. Groenewegen, K. H. Kaufhold, and J. Schumann (120 pp.)
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1871 (1990)	CARL MENGER, GRUNDSÄTZE DER VOLKSWIRTSCHAFTSLEHRE	Facsimile reprint of the first edition, published in Wien	... zu einem Klassiker der <i>subjektiven Wertlehre und des Marginalismus</i>	H. C. Recktenwald, F. A. v. Hayek, J. R. Hicks, and I. M. Kirzner (102 pp.)
1871 (1995)	WILLIAM STANLEY JEVONS, THE THEORY OF POLITICAL ECONOMY	Facsimile reprint of the first edition, published in London and New York	... zu einem Klassiker der <i>Grenznutzenschule</i>	B. Schefold, R. D. Collison Black, T. Negishi, and I. Steedman (132 pp.)
1873 (1996)	CARL KNIES, DAS GELD	Facsimile reprint of the first edition, published in Berlin	... zu einem deutschen <i>Klassiker der Geldtheorie</i>	B. Schefold, G. Eisermann, K. Häuser, and K. Yagi (143 pp.)
1873 (1996)	WALTER BAGEHOT, LOMBARD STREET	Facsimile reprint of the first edition, published in London	... zu einem Klassiker <i>der Banktheorie und Geldpolitik</i>	B. Schefold, M. A. King, D. P. O'Brien, and H. Rietter (192 pp.)

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1874 (1992)	WILHELM ROSCHER, GESCHICHTE DER NATIONAL-OEKONOMIK IN DEUTSCHLAND	Facsimile reprint of the first edition, published in Munich	. . . zu einem <i>Klassiker der deutschen Dogmengeschichte</i>	B. Schefold, J. G. Backhaus, G. Eisermann, P. D. Groenewegen, and F. Schinzinger (180 pp.)
1874–77 (1988)	LEON WALRAS, ÉLÉMENTS D'ÉCONOMIE POLITIQUE PURE OU THÉORIE DE LA RICHESSSE SOCIALE	Facsimile reprint of the first edition, published in two parts in Lausanne, Paris, and Basel	. . . zu einem <i>zentralen Klassiker der ökonomischen Statik</i>	H. C. Recktenwald, M. Blaug, and D. A. Walker (112 pp.)
1876 (1991)	ADOLPH WAGNER, ALLGEMEINE ODER THEORETISCHE VOLKSWIRTSCHAFTSLEHRE (GRUNDELEGUNG)	Facsimile reprint of the first edition, published in Leipzig and Heidelberg	. . . zu einem <i>Klassiker der Finanzwissenschaft</i>	K. Häuser, K.-D. Gröske, B. Schefold, and R. K. v. Weizsäcker (120 pp.)
1881 (1994)	FRANCIS YSIDRO EDGEWORTH, MATHEMATICAL PSYCHICS	Facsimile reprint of the first edition, published in London	. . . zu einem <i>Klassiker der Vertragstheorie</i>	B. Schefold, K. J. Arrow, W. Hildenbrand, and P. Newman (116 pp.)
1884 (1999)	FRIEDRICH VON WIESER, ÜBER DEN URSPRUNG UND DIE HAUPTGESETZE DES WIRTSCHAFTLICHEN WERTHES	Facsimile reprint of the first edition, published in Vienna	. . . zu einem <i>Klassiker der österreichischen Schule</i>	H. Hax, H.-H. Hoppe, H. D. Kurz, J. T. Salerno, R. Sturn, and E. W. Streissler (160 pp.)

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1899 (2000)	THORSTEIN B. VEBLEN, <i>THE THEORY OF THE LEISURE CLASS</i>	Facsimile reprint of the first edition, published in New York	. . . zu einem Klassiker des institutionellen Denkens	K.-D. Grüske, K. Dopfer, W. J. Samuels, and M. R. Tool (168 pp.)
1900–04 (1989)	GUSTAV SCHMOLLER, <i>GRUNDRISS DER ALLGEMEINEN VOLKSWIRTSCHAFTSLEHRE</i> MAX WEBER, <i>DIE PROTESTANTISCHE ETHIK UND DER 'GEIST' DES KAPITALISMUS</i>	Facsimile reprint of the first edition, published in two parts in Leipzig Facsimile reprint of the first edition, published in two parts in Tübingen	. . . zu einem Klassiker der historischen Methode in der ökonomischen Wissenschaft . . . zu einem Klassiker der Geschichte ökonomischer Rationalität	H. C. Recktenwald, J. Backhaus, B. Schefold, and Y. Shionoya (127 pp.) B. Schefold, K. H. Kaufhold, G. Roth, and Y. Shionoya (144 pp.)
1906 (1991)	IRVING FISHER, <i>THE NATURE OF CAPITAL AND INCOME</i>	Facsimile reprint of the first edition, published in New York and London	. . . zu einem Klassiker der Nationalökonomie	P. A. Samuelson, J. Tobin, and B. Schefold (95 pp.)
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Index

- 1815 pamphlets on rent 9–10, 28–40
- Abelshauser, W. 367
- abolition of money 95
- absolute surplus value 125
- abstinence theory 195
- accounting 116
- accumulation 70–1, 87–8
- acquisition, forms of 99–100
- acquisitive principle 344–5
- Adenauer, K. 376
- Adler, M. 172
- agriculture: peasant family economy
310–22, 384–5, 390–1; returns to 35–6
- Åkerman, J.G. 6–7, 359; *The Problem of a
Socio-Economic Synthesis* 299–310
- Alcouffe, A. 262
- Allen, J. (later Sismondi) 42, 43
- alternatives, analysis of 308–9
- American Economic Association 216, 294
- American Institutionalism 6, 216, 290
- amortization 111–13, 194
- Analytical Engine 52–3
- Anderson, J. 33, 184
- approaches to the history of economic
thought 1–2, 3–5
- Aristotle 45, 60, 64, 65, 92, 103, 178;
exchange 59; interest 202; kinds of
acquisition 99
- Arnon, A. 132
- Ashcraft, R. 22
- Ashley, Lord (later Earl of Shaftesbury) 21
- associations 382
- asymmetrical duopoly 340
- Aumann, R.J. 262
- Auspitz, R. 14, 264–8
- Australia 387
- Austrian capital theory 184
- Austrian School 100, 230
- autarky 361–2
- average industry 79–80
- average production period 199, 204, 222–3
- Babbage, C. 11, 48–57, 127
- Backhaus, H.-G. 57, 58
- Bagehot, W. 13, 147–57
- Bank Charter Act 1844 152, 154, 155
- Bank of England 131, 148–51, 152–7
- bank notes 95, 133, 134, 162, 287–8
- bank reserves 149–50, 152, 155, 156, 165–6
- Banking-Currency Controversy 131–2
- Banking School 13, 133
- banking system 147–57; free 149–50, 151,
152, 156–7; natural 149, 156
- banks 12–13; profit rates 164–8; regulation
131–2
- Barbon, N. 102
- barter economy 117

- Becker, W. 57, 58
 Belgium 387
 Bentham, J. 178
 Bernoulli, D. 49, 263
 Bertrand, J.L.F. 341
 biological regularities 313
 Bismarck, O. von 289
 Blaug, M. 157
 Böhm, F. 372
 Böhm-Bawerk, E. von 16, 92, 110, 188–215, 265, 299, 327; and Fisher 221, 222, 226–7; Hilferding's response to his critique of the third volume of *Capital* 159; history and critique of theories of interest 188–200, 202–3; *Positive Theory of Capital* 200–15; transformation problem 69, 74–5
 Bonar, J. 34, 189
 Bortkiewicz, L. von 69–70, 209
 Boulding, K.E. 293
 Bowley equilibrium 338, 339
 Brauns Commission 375
 Brentano, F. 264
 Brentano, L. 202–3
 Bretton Woods system 95
 Brüning, H. 174, 175
 Bücher, K.W. 280, 283
 Bukharin, N. 310
 Bundesbank 373
 Burckhardt, J. 278, 281, 365
 business cycle 89, 92–5, 169, 301–2, 356–8, 376–8
- calculating machines 48–9, 52–3
 Calvinism 364
 Cambridge University 8, 50, 245–6, 260
 Cannan, E. 189
 capital: Åkerman's theory 305; Austrian theory 184; Böhm-Bawerk's theory 200–15; circulation of 97–8; comparison of capital theories of Pareto and Walras 235–6; demand and supply of 14–15, 349; fictitious 94–5, 163; finance 161–70; Fisher on income and 216–28, 233; fixed *see* fixed capital; Jevons 184; metamorphoses of 113–18; organic composition of 56, 88–9; paradox of 81; turnover of 118–22; variable 119
 capital intensity 79–80, 211–12
 capitalism: development of 160–1, 358–61; Marx's definition 98–102; organised 170–5, 355, 378; Röpke's critique of 383
 cardinal utility 236
 Carta del Lavoro 362
 cartels 167–8, 170, 382
 Cauchy-Riemann differential equations 240–3
 causal analysis 308–9
ceteris paribus conditions 254
 Chamberlin, E. 248, 249, 335, 340, 392; imperfect competition 244–5, 249, 263, 334, 342
 Chayanov, A.W. 7; *The Theory of Peasant Economy* 310–22
 Chayanov's rule 321
 chrematistic acquisition 99–100
 Churchill, W.S. 257
 Circuitistes 95, 120
 circulation 94, 97–122; law of 161; metamorphoses of capital 113–18; turnover of capital 118–22; unity of production and circulation 106–13; use value and 102–5
 civil liberties 297
 Clapham, J. 246, 250, 251, 253, 254
 Clark, J.M. 335
 Classical economics 6, 9–13; *see also* Marx, K., Ricardo, D., Smith, A.
 closed market forms 343
 coal supply 179–80
 collectivism 320, 386–7
 Colmar, T. de 52
 combined development 312
 commanded labour prices 75–7, 78, 139, 141
 commodities 102; craft commodities 86–7; dated 18; standard commodity 80–1, 106–7, 108, 138–9
 commodity fetishism 64–5
 commodity knowledge 86
 Commons, J.R. 6, 290–9
 communication technology 147
 communism 320
 competition 260–1; declining 332; imperfect *see* imperfect competition; workable 335
 computers 48–9
 concentration of economic power 388–9
 Condorcet, J.-A.-N. de C. 237
 consumer goods 143–7
 consumption 120–1, 220
 consumption tax 218
 contract curve 338
 contracts 187–8
 Copeland, M.A. 299
 Copernicus, N. 12
 corn model 9–10, 30–40, 47, 71–3, 95–6
 Corn Pamphlets 9–10, 28–40

- correspondence principle 346–7
 Cournot, A.A. 14, 49, 55, 177, 185, 247;
 duopoly 338–40, 340–1, 341–2; *Research
 into the Mathematical Principles of the
 Theory of Wealth* 260–3
 craft commodities 86–7
 credit 12–13, 133, 154; Hilferding 162–3;
 Locke 27; Marx 85–96
 credit economy 117
 Creedy, J. 187–8
 crises 10–11, 133, 377–8; Marx 93–5;
 Sismondi 45–7
 Croce, B. 388
 Cromwell, T. 22
 culture 277–80
 currency reform 367–8
 Currency School 13, 133; Banking-
 Currency Controversy 131–2
 cycles, economic 89, 92–5, 169, 301–2,
 356–8, 376–8
 cyclical policy 358, 366, 368
- dated commodities 18
 declining competition 332
 declining rate of profit 5, 11, 31, 35–6,
 87–8, 227–8
 demand 284–5, 346–7; effective 17, 19, 89;
 for money 286–7; paradox of 237, 238
 demand and supply 74–5, 270; Böhm-
 Bawerk 74–5, 208–9, 270; of capital
 14–15, 349; Hilferding 160; Jevons 182;
 Schmoller 284–5
 Denis, H. 47, 263
 depreciation 83–5, 111–13, 118–19, 150
 depression 147, 174
 derived curve 266–7
 determinism 360–1
 devaluation 225
 development 350; capitalist 358–61;
 combined 312
 Difference Engine 53; No. 1 52; No. 2 49, 52
 differential equations 237–44
 differential rent 9–10, 28–40
 Dilthey, W. 275–6, 277–9, 280, 281
 diminishing returns 33, 35–6, 252, 253,
 254
 Diogenes 314
 disequilibrium 47, 126–7
 distribution 5, 197, 206; Chayanov 317;
 Jevons's theory of 184–5; ordering
 development of economic theory
 according to theories of 8–20; Pareto
 234–5; relationship to growth 89–94;
 Ricardo, price and 30–3, 206; Tooke's
 An Inquiry into the Currency Principle
 and the theory of 131–47
 division of labour 53–5, 114
 Dmietriev, V.K. 69, 189, 315
 domestic economy 99–100
 domestic production 321–2
 Dopsch, A. 60
 Dorfman, J. 294
 duopoly 335, 336, 337–42
 Düring, E. 189
- economic control 368
 economic cycles 89, 92–5, 169, 301–2,
 356–8, 376–8
 economic democracy 171
Economic Journal debate 19, 244–60,
 262–3, 334
 economic stages 59, 279–81, 281–3
 economic styles 279, 353–4, 363–5
 economic systems 372; Åkerman 301,
 304–8; non-capitalist 319–20
 economies of scale debate 19, 244–60,
 262–3, 334
 Edgeworth, F.Y. 17–18, 236, 261, 269, 341;
 Mathematical Psychics 185–8
 effective demand 17, 19, 89
 Ely, R.T. 294
 employment 5, 16–20; full 212–13
 Engels, F. 68, 69, 87, 93, 97–8, 120
 Engels, W. 150–1
 England: Bank Charter Act 152, 154,
 155; banking system 147–57; London's
 financial market 148, 154
 English Civil War 22
 entrepreneurial function 92, 128
 entrepreneurial profit 91, 195–8
 environmental problems 388, 390
 Epstein, L.G. 214–15
 equilibrium: general 17–18, 226–8, 255,
 267; intertemporal *see* intertemporal
 equilibrium; long-term 232–3, 348–9;
 Nash 336; Stackelberg's concept of
 332–45; temporary 79, 348–51, 393
 equilibrium economics 305, 307
 equity capital 165–7
 Erhard, L. 354, 372, 376
 ethics 309
 Eucken, W. 7, 244, 301, 307, 353, 385;
 economic systems and economic
 models 372–3; Müller-Armack's work
 compared with 370–1; Stackelberg 333,
 343–4
 Europe 147
 European integration 366–7

- European Union 373; Maastricht Treaty 356, 373, 388
- evolutionarily stable market behaviour 332–45
- evolutionary economics 1, 303, 350–1
- exchange 25, 59–60; Edgeworth 186–8; intertemporal 193, 195, 201, 202–4, 219
- exchange value 86, 102, 203
- expanded reproduction 122–3
- expectations 308
- expenditure tax 218
- exploitation 66, 103; theory 55, 195, 206–7
- falling rate of profit 5, 11, 31, 35–6, 87–8, 227–8
- family economy 313–14; peasant family economy 310–22, 384–5, 390–1
- fascism 301, 344, 378
- Feldman, G.A. 122, 310
- Fetter, F.A. 386
- Fetter, F.W. 153
- feudal system 44–5
- fictitious capital 94–5, 163
- finance capital 161–70
- First World War 173, 200, 236, 287, 327, 368, 378
- Fisher, A.G.B. 387
- Fisher, I. 16, 135, 216–33, 263; determination of interest and long-term equilibrium 229–33; *The Nature of Capital and Income* 216–28
- fixed capital 105–13, 143–6; Marx 83–5, 118–19; *see also* machinery
- flows, stocks and 220
- Flügge, E. 294
- forms of value, theory of 57–69
- founder's profit 13, 86, 163–4
- France, A. 42
- France 44–5, 147
- Frayssé, J. 262
- free banking system 149–50, 151, 152, 156–7
- free trade 169
- Freiburg School 7
- Frisch, R. 302, 303–4
- full employment 212–13
- full employment interest rate 331, 392
- Garegnani, P. 212, 349
- Gelesnoff, W. 315
- general equilibrium 17–18, 226–8, 255, 267
- Genmei, Empress 61
- George, H. 221
- German Federal Republic 371–2, 376; post-war 367–8, 388
- German ordoliberalism 7–8, 371–3; *see also* Eucken, W., Müller-Armack, A., Röpke, W.
- Germany 147, 318, 333, 389; inter-war 173–5; National Socialism *see* National Socialism; reunified 116
- Gerschenkron, A. 310
- Gibbs, J.W. 217
- Gibson's paradox 135
- Giffen's paradox 237
- gift giving 59–60
- Glick, M. 82
- Goethe, J.W. von 278
- gold 11–12, 95
- gold standard 95, 147–8, 257, 378
- Gossen, H.H. 177, 185, 348
- Gothein, E. 278
- Grampp, W.D. 35, 36
- gravitational model 75
- Great Britain 387, 388; *see also* England
- Great Depression 174
- group allegiance 309
- Grove, W. 63
- growth: economies of scale debate 244–60; models 122; relationship with distribution 89–94
- Grünberg, C. 172
- Gründergewinn* (founder's profit) 13, 86, 163–4
- guided economy 368–70
- guilds 86
- Hahn, F. 347
- Hansen, A. 346
- Harrod, R. 126, 331, 352–3
- Hayek, F.A. von 226, 372
- Hennis, W. 277
- Heuß, E. 333
- Hicks, J.R. 17, 238, 303, 345; *Value and Capital* 348–53
- Hicks, U. 351
- hierarchy of needs 317
- Hildebrand, B. 117, 154
- Hilferding, R. 13, 69, 86, 95, 157–75, 208
- historical method 275–81
- Historical School 6, 124, 289–90, 381, 382; Marx and 58, 69; relationship to Institutionalism 216, 293–5; Wicksell and 328

- historicism 273, 275–81
 Hitler, A. 175
 Hollander, S. 30
 household economy 99–100
 housework 316
 human sciences 275–81
 Hunt, E.K. 82
 Hutchison, T. 28
- imperfect competition 167–8; Cournot
 260, 262–3; economies of scale debate
 19, 244–60, 262–3, 334; Stackelberg
 332–45
 imperialism 161, 170
 income: Fisher on capital and 216–28;
 national 123–4, 261
 increasing returns 244–60, 262
 independent peasantry 44, 45
 India 314
 indifference curves 17–18, 236, 237–44
 Industrial Revolution 50
 inflation 141–7, 288, 388
 input-output analysis 124
 Institutionalism 2–7, 216; American 6,
 216, 290; relationship to the Historical
 School 216, 293–5; *see also* Åkerman,
 J.G., Chayanov, A.W., Commons, J.R.,
 Schmoller, G. von
 integration 237–44
 intellectual labour, division of 53–5
 interest: Böhm-Bawerk 188–200, 202–5,
 209–11, 213; Fisher 219–28; history of
 theories of 188–200, 202–3
 interest rates 217–18; Bagehot 155–6;
 Fisher's determination of 229–33; full
 employment 331, 392; Hilferding 163;
 Locke 25–8; monetary 225, 230, 330–1,
 392; natural 25–6, 135–6, 330–1, 392;
 neutral 331; own rates of interest 93,
 203, 213–14, 226; and profit rate 19,
 89–94, 195–8; real 225; Tooke 134–47;
 Wicksell on prices and 328–32
 intermediate goods 18, 108
 intertemporal capital theory 200–15
 intertemporal equilibrium 18–19, 93–4,
 349–50; Böhm-Bawerk 203, 205–6,
 212–13, 214; Fisher 225–6, 230–2
 intertemporal exchange 193, 195, 201,
 202–4, 219
 interventionary state 353–71, 373
 intuitive theory 124–5
 investment 18, 155–6, 356–7, 378–9
 IS-LM-Model 349
 Italy 147, 154, 301, 387
- Japan 61, 314
 Jefferson, T. 23, 394
 Jevons, W.S. 14, 177–85, 305
 job creation 174–5
 joint production 83–5, 110–13, 143,
 183
 joint-stock companies 164
- Kahn, R.F. 246, 326
 Kaldor, N. 218, 249, 333
 Kalecki, M. 89, 218
 Kaufhold, K.H. 289
 Kautsky, K.J. 172, 173, 312
 Keynes, J.M. 5, 16–17, 19, 96, 97, 217–18,
 299, 357; Bagehot 151–2; compared with
 Böhm-Bawerk 200–1; contribution and
 influence 300; deflation 212; economies
 of scale debate 246, 260; Edgeworth
 187, 269; Gibson's paradox 135; Hicks
 and 349; interest 89, 198, 210; interest
 rate 150; Jevons 179, 180–1; liquidity
 preference 210; long-term interest rates
 146; natural interest rate 331; Röpke and
 375
 Knight, F. 291
 Kondratiev, N. 310
 Koopmans, T.C. 214
 Kugelmann, F. 158
 Kula, W. 316
- labour: division of 53–5, 114; Jevons
 182–3; Marx and the value form theory
 62–85, 206–7; negative labour values
 84–5
 labour theory of value 86–8, 118, 159;
 Locke 23–5
 labourers, protection of 297–8
 Lamprecht, K.G. 280
 land 143–6, 184, 296; peasant economy
 317–18
 Lange, O. 333
 legal system 296–7
 Leibniz, G.W. 52
 Lenin, V.I. 161, 170, 173, 310, 312
 Leontief, V. 97, 310
 Lerner, A.P. 352
 liberal socialism 386–7
 liberalism 375–6, 381–2
 Lieben, R. 14, 264–8
 linear depreciation 112–13
 liquidity preference 210
 List, F. 382
 location theory 317–18
 Locke, J. 8, 12, 21–8

- logical action 238
 London's financial market 148, 154
 long-run cost curves 248
 long-term equilibria 232–3, 348–9
 Lovasy, G. 387
 Lovelace, A. 53
 Luxemburg, R. 161, 170, 173
 luxury goods 74, 100, 107–8
- Maastricht Treaty 356, 373, 388
 Mach, E. 172
 machinery 46–7; Babbage 48–57; *see also*
 fixed capital
 Machlup, F. 352
 Magna Carta 296
 Malinowski, B. 279–80
 Malinvaud, E. 226
 Malthus, T.R. 29, 33, 34–5, 46
 manufacturing 50, 53–7
 marginal revenue curve 247
 Marginalist Revolution 177
 market economy 382–8; social market
 economy 353–71, 373
 market prices 9
 market segmentation 255–6
 market stability 332–45
 Marshall, A. 5, 262, 351; Böhm-Bawerk
 and 190–1, 201; economies of scale
 debate and 245, 246, 247, 249–50, 251,
 259, 334; Jevons 177; normal prices 13
 Marx, K. 5, 8, 11, 12, 21, 57–125, 157–61,
 189, 222, 283, 355; banking system
 149–50; Böhm-Bawerk's critique of
 208–9; circulation of capital 97–8;
 combined development 312; corn model
 10, 39–40; definition of capitalism
 98–102; letter to Vera Zasulich 313;
 materialism 1; metamorphoses of
 capital 113–18; profit and interest 197,
 198; reproduction schemes 98, 122–5;
 technical progress 56; theory of credit
 and of crises 85–96; theory of forms of
 value 57–69; transformation problem
 67, 68, 69–85, 206–7; turnover of capital
 118–22; use-value and circulation 102–5
 mass entertainment 380
 mass production 380
 mass society 380–8
 material culture 280
 materialism 1
 mathematical economics 185; Cournot
 260–3
 Mauss, M. 60
- maximization 346
 maximum profit rate 76, 78, 199, 222–4
 medium-sized enterprises 384–5
 Meillassoux, C. 313
 Menabrea, L. 52
 Menger, C. 177, 190, 193–4, 273, 275–6,
 281, 352
 Mercantilism 28, 282, 283
 metal coinage 161–2
 metallism 60
 metamorphoses of capital 113–18
 Metzler, L. 346
 Milgate, M. 226, 270
 Mill, J. 30, 184
 Mill, J.S. 39, 153, 178, 183, 185, 388
 Minsky, H. 89
 Mitchell, W.C. 290–1, 293, 295
 modern Neoclassicals 5, 17–19; *see also*
 Hicks, J.R., Müller-Armack, A., Röpke,
 W., Samuelson, P.A., Stackelberg, H.
 von, Wicksell, K.
 Möller, A. 174
 monetary interest rate 225, 230, 330–1, 392
 monetary orthodoxy 148, 154
 monetary theory: Bagehot 147–57;
 Hilferding 157–75; Schmoller 286–8;
 Tooke 131–47
 money 11–13, 20, 60–1, 95; abolition of 95;
 introduction in Japan 61; Locke 26–8;
 quantity theory 16, 135, 327, 328–9
 money capital 94–5
 Monissen, H. 217, 228
 monopoly 334, 338–9; closed monopolies
 343
 Mont-Pèlerin Society 366, 376
 Montaner, A. 294–5
 Montesquieu, Baron de 369
 Morgenstern, O. 352
 Morishima, M. 85, 348
 Mühlpfordt, W. 69
 Müller, J. von 41
 Müller, J.H. 52
 Müller-Armack, A. 7, 279, 372, 373, 394;
 from the interventionary state to the
 social market economy 353–71
 Myrdal, G. 249
- Napoleonic wars 34–5
 Nash equilibrium 336
 national income 261; flow of 123–4
 national income accounting 94–5
 National Socialism (Nazism) 7–8, 301, 365;
 Müller-Armack 355, 361–3, 368–9, 373;

- Röpke 375, 386; Stackelberg 333, 362, 392–3
- nationalization 251–2
- natural banking system 149, 156
- natural interest rate 25–6, 135–6, 330–1, 392
- natural price 9, 77–8
- necessary goods 74, 100
- need satisfaction principle 344–5
- needs, hierarchy of 317
- negative labour values 84–5
- Neoclassical economics 5, 13–16, 124; *see also* Auspitz, R., Böhm-Bawerk, E. von, Cournot, A.A., Edgeworth, F.Y., Fisher, I., Jevons, W.S., Lieben, R., Marshall, A., Pareto, V., Walras, L.
- Neumark, F. 375
- neutral interest rate 331
- New Deal 301, 384
- New Zealand 387
- Niehans, J. 185, 345
- Nietzsche, F. 281
- nominalism 60
- non-capitalist economic systems 319–20
- normal prices 13–14, 15–16
- Norman, G.W. 93, 149
- obsolescence 111–12
- Ohlin, B. 325–6
- oligopoly 334–7, 343
- open market forms 343
- optimal values 85
- optimization 346
- ordinal utility 236
- ordoliberalism 7–8, 371–3; *see also* Eucken, W., Müller-Armack, A., Röpke, W.
- Oresme, N. 60
- organic composition of capital 56, 88–9
- organised capitalism 170–5, 355, 378
- overproduction 183–4
- own rates of interest 93, 203, 213–14, 226
- Pagano, U. 54
- pamphlets 9–10, 28–40, 244
- panics 155
- paper money 95, 133, 134, 162, 287–8
- paradoxes 237–8
- Pareto, V. 17–18, 233–44, 267; indifference curves 237–44; *Manual of Political Economy* 233–6
- partial-analytic thinking 226–7
- partial equilibrium analysis 267–8
- Pascal, B. 52
- path dependency 291–2
- path dependent/independent integration 239–43
- pay-as-you-go pension system 388
- peasant family economy: Chayanov 310–22; Röpke 384–5, 390–1
- peasant proprietors 44, 45
- Peel, R. 131, 152
- periodic cycle 47
- Perrotta, C. 364
- Petty, W. 8, 23–4
- Pigou, A.C. 245, 249, 251–2, 256
- Pivetti, M. 132
- planned economy 308, 320
- Plato 178
- Plekhanov, G.V. 315
- Polanyi, K. 297
- political approach 1–2, 4
- political organisation 283
- positive theory of capital 200–15
- positivistic approach 3
- post-Keynesians 5, 19–20, 330
- power 19, 209; concentration of economic power 388–9
- precious metals 12, 134, 286–7; *see also* gold, silver
- preferences: paradoxes related to 237, 238; time preference 214–15, 229–32
- Pribram, K. 386
- prices: and distribution in Ricardo's corn model 30–3; market prices 9; normal prices 13–14, 15–16; production prices 70, 105–13; relative prices 31, 186–7, 329; Schmoller's value and price theory 283–6; Tooke on interest rates and 134–47; transformation of values into prices 67, 68, 69–85, 159–60, 206–7; Wicksell on interest rates and 328–32
- prices in labour commanded 75–7, 78, 139, 141
- Priebe, H. 390
- printing press 47
- privately emitted bank notes 133, 134
- process innovation 101, 104
- product innovation 101, 104
- production 38–40; and circulation 114–16; and consumption 120–1; domestic 321–2; joint 83–5, 110–13, 143, 183; mass 380; roundabout 202, 204; unity of circulation and 106–13
- production costs 37–8, 220–1, 329
- production period 31, 108–10; average 199, 204, 222–3; Böhm-Bawerk 211–12; Fisher 222–4

- production prices 70, 105–13
 productivity theories of interest 191–2, 195, 202, 221–2
 profit rate: falling 5, 11, 31, 35–6, 87–8, 227–8; and interest rate 19, 89–94, 195–8; maximum 76, 78, 199, 222–4
 profits: banks' 164–8; entrepreneurial profit 91, 195–8; founder's profit 13, 86, 163–4; Tooke and the theory of distribution 136–47
 progress 327–8; technical 48–57, 88–9
 progressive depreciation 112–13
 promoter's profit 13, 86, 163–4
 property rights 23–5, 295–7
 protectionism 289
 purpose 291–3
- quantity theory 16, 135, 327, 328–9
 quasi-rents 136–7
quasi-usus fructus 193
 Quesnay, F. 97
- Radbruch, G. 174
 Rae, J. 221
 rational theory 124–5
 real interest rate 225
 reduction to dated quantities of labour 76, 77, 78, 222
 regulation 384; of banks 131–2
 relative prices 31, 186–7, 329
 relative surplus value 66–7, 124–5
 relativistic approach 1, 3–4
 religion, sociology of 365–6
 Remak, R. 70
 rent 33, 43, 77–8, 143–7; 1815 pamphlets 9–10, 28–40; Jevons 184; prices and interest rates 143–6
 reproduction model 37–9
 reproduction schemes 98, 122–5
 reserves, bank 149–50, 152, 155, 156, 165–6
 reswitching 211–13, 224, 233
 Ricardo, D. 5, 11, 28–9, 68, 71, 87, 265, 365; Bagehot and 152; corn model 9–10, 30–40; distribution 30–3, 206; exchange value 203; interest rate 90, 196; Jevons and 177, 178, 185; rent 9–10, 30–7; rising wages and falling profit rate 15–16; Sismondi and 43, 46; Wicksell and 326–7
 Rieter, H. 132
 Robbins, L. 31–2, 245, 258–9
 Robertson, D. 245, 251–2, 259–60
 Robinson, J. 57, 263, 303, 331, 332, 342, 357; imperfect competition 244–5, 344–5; and Marx 70–1, 72, 87–8; natural interest rate 392
 Rooke, J. 33
 Roosevelt, F.D. 301, 384
 Röpke, W. 8, 48, 353, 371–91, 394
 Roscher, W. 188–9, 200, 314
 roundabout production 202, 204
 Rousseau, J.-J. 23
 Russia: economics 310–11, 314–15; peasant family economy 310–22
 Rüstow, A. 48, 353, 372, 375–6
- Sahlins, M. 313, 321–2
 Salin, E. 124, 289, 315, 378, 389
 Samuelson, P.A. 17, 122–3, 226, 252, 351; *Foundations of Economic Analysis* 345–7
 savings 155–6, 356–7, 379
 Say's Law 10
 Schmoller, G. von 2–6, 273–90, 294–5, 328; economic stages 279–81, 281–3; historical method in economics and historicism in the human sciences 275–81; limits of his theoretical achievements 288–90; theoretical aims 273–5; theory of money 286–8; value and price theory 283–6
 Schneider, E. 346
 Schumpeter, J.A. 2, 87, 97, 168, 189, 198, 236, 299, 300, 312, 355; Diltthey 277; economies of scale debate 249–50, 257–8, 260; imperialism 161, 170; interest 209–10; Samuelson and 346; Schmoller 294
 Science Museum, London 49
 Second World War 201, 333, 367, 368
 secondary deflation 378
 secondary rules 210–11
 segmentation of markets 255–6
 seismographs 51–2
 Seligman, E.R.A. 33
 Senior, N. 195, 329
 sequential analysis 86
 serfdom economy 319–20
 services 101–2
 Shackle, G.L.S. 246–7
 short-run cost curves 248
 Shove, G. 246, 256, 260
 Shubik, M. 261–2
 Sidgwick, M. 276
 silver 12
 simple commodity production 87
 simple reproduction 122–3
 Singer, H.W. 386
 Sinzheimer, H. 170

- Sismondi, J.C.L. 10, 41–8, 126–7
 situation-related paradoxes 237–8
 Skourtos, M. 30
 slave economy 319, 320
 Slutsky, E. 352
 Smith, A. 5, 87, 256, 314; Bagehot 152;
 Böhm-Bawerk and 196–7; division of
 labour 54; exchange value 203; falling
 profit rate 11; interest 198, 203; Marx
 and 68; prices 9, 31, 77–8
 Social Democratic Party (SPD) 172, 173, 174
 social market economy 353–71, 373
 social security 383–5, 388
 socialisation 94
 socialism 207–8, 360, 378, 380; Hilferding
 171–5; liberal 386–7
 society, mass 380–8
 socio-economic synthesis 299–310, 359
 sociology 306–7; of religion 365–6
 Sombart, W. 278, 294, 305–6, 362–3
 Soviet Union 171, 301; *see also* Russia
 specialisation 114
 Spiegel, H.W. 47, 48
 Spiethoff, A. 6, 273, 289, 377
 spiritual culture 280
 spot economy 350
 Sraffa, P. 19, 57, 58, 96, 126; economies
 of scale debate 244, 246, 247, 248, 249,
 250, 252–6, 259–60, 262, 334; own
 rates of interest 226; production prices
 70, 106–13; Ricardo 28, 30, 32–3;
 scheme for the unity of production and
 circulation 106–13; standard commodity
 80–1, 106–7, 108, 138; transformation
 problem 72–7, 80–1, 84
 stability 346; market 332–45
 Stackelberg, H. von 7, 186, 247, 258, 362,
 392–3; concept of equilibrium 332–45
 Staël, Madame de 41, 42
 stages, economic 59, 279–81, 281–3
 Stalin, J. 171, 310, 312
 standard commodity/good 80–1, 106–7,
 108, 138–9
 standard industry 80
 standard system 106
 state 382; Hilferding's organised capitalism
 170–5; intervention 47–8, 344–5,
 353–71, 373
 statistics 181–2
 Steedman, I. 85
 Stigler, G.J. 264
 Stockholm School 326
 stocks, flows and 220
 storage costs 117
 Storch, H.F. von 314
 Strasser, G. 174–5
 Stresemann, G. 173, 174
 Struve, P.B. 315
 styles, economic 279, 353–4, 363–5
 Suez Canal 147
 supply 74–5; and demand *see* demand and
 supply; of money 286–7
 supply curve 256
 surplus value 32, 66–8, 73–4, 85, 206;
 absolute 125; relative 66–7, 124–5
 Switzerland 381, 382, 387, 391
 taxation 251–2; consumption tax 218
 technical progress: Babbage 48–57; Marx
 88–9
 temporary equilibria 79, 348–51, 393
 Theoharis, R.D. 263
 Thornton, H. 148
 Thünen, J.H. von 327
 time economics 305–6, 307
 time preference 214–15, 229–32
 Tooke, T. 13, 90, 327, 330; *An Inquiry into
 the Currency Principle* and the theory of
 distribution 131–47
 Torrens, R. 29, 32, 37–40, 96, 126
 trade 385; free 169; protectionism 289
 trade unions 297–8
 transformation of values into prices 67, 68,
 69–85, 159–60, 206–7
 transition economies 384
 transport costs 117
 Trotsky, L. 173
 Trotskyism 171
 Tugan-Baranovsky, M. 315
 Turgot, A.R.J. 192
 turnover of capital 118–22
 ultra-imperialism 173
 unemployment 328; caused by technology
 46–7
 United States (US) 147, 216, 256; New Deal
 301, 384
 use value 70, 86, 91–2, 100–1, 118; and
 circulation 102–5
 usury 91–2, 99
 Utilitarianism: Edgeworth 187–8; Jevons
 and the path to 177–85
 utility: cardinal and ordinal 236; Pareto's
 indifference curves 238–43
 utilization theory of interest 192–5, 202
 value 5, 8–16; exchange value 86, 102, 203;
 Jevons 182; labour theory of 23–5, 86–8,

- 118, 159; Marx and the theory of forms of 57–69; ordering of development of economic theory according to theories of 8–20; Schmoller 283–6; transformation of values into prices 67, 68, 69–85, 159–60, 206–7; use value *see* use value
- variable capital 119
- Veblen, T. 290–1, 293, 294, 299
- Velupillai, K. 303–4
- Versailles Treaty 200, 236
- Viner, J. 346
- visual theory 124–5
- von Neumann, J. 49, 70, 110, 244, 352
- voting paradox 237
- wages 15–16, 30–1, 79–80
- Wagner, A. 132, 315
- Walras, L. 5, 8, 13, 177, 233, 235, 305, 327; Auspitz and Lieben 265, 267–8; imperfect competition 262; theory of capital formation 14–15; utilization theory 192, 194–5
- Warenkunde* (commodity knowledge) 86
- weak homogeneity of labour 63–4
- wealth 219
- Weber, M. 1, 20, 277, 291, 343, 344; sociology of religion 365–6
- welfare state 48, 383–5, 388
- West, E. 29, 33, 35–7
- Wicksell, K. 16, 90, 301–2, 341–2, 392; *Interest and Prices* 325–32; and Tooke 132, 135
- will 291, 298–9
- Winter, J. 264
- workable competition 335
- World War I 173, 200, 236, 287, 327, 368, 378
- World War II 201, 333, 367, 368
- Xenophon 103
- Young, A. 245, 249, 250, 256–7, 260
- Zasulich, V. 313