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ECONOMICS FOR SUSTAINABLE PROSPERITY

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Binzagr Institute for Sustainable Prosperity

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"Sustainable prosperity" is a holistic notion encompassing the physical, mental, environmental, financial, educational, and civic wellbeing of all individuals, families, neighborhoods, and regions throughout the world. In this sense, sustainable prosperity requires the development of a multifaceted public policy framework addressing the root causes of global, national, and regional socioeconomic challenges. It must guarantee all individuals a decent quality of life with dignity and the opportunity to be a member of an inclusive, participatory, and just society. Sustainable prosperity means that every decision we make, individually or collectively, must take into account its direct and indirect effects on people, on the planet, and on the economy.

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Preface

This book has been written largely in response to comments made by Fadhel Kaboub, the President of the *Binzagr Institute for Sustainable Development* and Associate Professor of Economics at Denison University, on a doctoral thesis I submitted in 2016. He wrote that he would recommend me publishing the dissertation as a book, but would also encourage 'the publication of a non-technical version of this work to invite non-academic audiences into these very important public policy discussions. After all, public policy in a democratic society ought to be truly participatory in nature, but when the public lacks the ability of understanding the basic implications of alternative economic policy proposals, and also lacks the ability of challenging so-called experts, then we end up with people submitting to policies that actually work against their own interest, and increase inequality and socio-economic exclusion'.

I set out to do as he recommended. However, I have not removed every equation and chart from the book, since to do so would have blunted its effectiveness in advocating for the replacement of the neoclassical orthodoxy which has been used so successfully in support of a neoliberal agenda in recent decades, with a new economics for sustainable prosperity, which can be used in support of a genuinely progressive and inclusive agenda for the future. Instead, I have kept them to a minimum, explaining their significance along the way, and occasionally inviting those readers not wanting to bother with algebra to take the results for granted and move on.

At the heart of this new economics is modern monetary theory. In February 2018, I saw a podcast of a brilliant interview, conducted by Steve Grumbine of Real Progressives, with two of the founders of modern monetary theory, Professor Stephanie Kelton and Professor William Mitchell. Kelton and Mitchell separately made the point that without an understanding of modern monetary theory, there can be no successful prosecution of a genuinely progressive agenda in the USA or elsewhere, and that the achievement of equitable and sustainable prosperity in the future depends on a widespread understanding of the principles of modern monetary policy among the voting public.

As Professor Joan Robinson said, long ago, people need to learn some economics to avoid being fooled by economists. It is my hope that people will choose to read this book, and that it will help equip them with enough understanding of both the old economics and the new so that they are not fooled, but instead are empowered by what they have learned.

My thanks go to Philip Lawn, a colleague and a mentor over many years, at both the University of Adelaide and Flinders University. I have also benefited greatly from regular discussions with Colin Rogers, at the University of Adelaide; with Anna Mihaylov, now at Kaplan Australia; and, in recent times, with the prize-winning journalist, Claire Connelly. Occasional opportunities down the years to talk with and to be inspired by Geoffrey Harcourt have also been a treasure.

I wish I could thank an unknown banker, who, in spite of his seniority at work, was a student on a course I was teaching in London, leading to the membership examinations of the Chartered Institute of Bankers, at some point during the late 1990s. He approached me, at the end of an intensive course, and, with reference to the orthodox description of monetary policy, said, 'You know it couldn't really work that way, don't you?'

Twenty years later, I now know very well that it doesn't work that way. This book is an attempt to share with you some of what I have learned.

My greatest debts will always be to my father and late mother, Tom and Trudy, and to my wife, Katherine, for their unfailing love and support.

Adelaide, Australia Steven Hail

Contents

List of Figures

List of Tables

CHAPTER 1

Introduction—Searching for a New Economics

I arrived as a student at the *London School of Economics*, nearly four decades ago, full of enthusiasm and idealism, wanting to learn how to make the world a better place. I had already done 'Advanced' level economics at school, and read a little bit of Keynes, without properly understanding what I was reading. I believed in 1981, as he had written in 1935, that 'the outstanding faults of the economic society in which we live are its failure to provide for full employment and its arbitrary and inequitable distribution of wealth and incomes'. This seemed obvious, and under the Prime Ministership of Margaret Thatcher, it was only getting worse.

I had at least taken in Keynes' statement, made in the final sentence of *The General Theory*, that 'soon or late, it is ideas, not vested interests, which are dangerous for good or evil', although this is in part because I have always had a tendency to read the final sentence in a book before reading what goes before it. Like many of my contemporaries, I wanted to learn about how the world worked. I wanted a set of ideas which would help to bring about a better society.

What I got, from lecturers who were, in many cases, among the leading economists of the day, was training in pure mathematics, and particularly in the fruits of the rational expectations revolution in macroeconomics of the previous decade. By the time I left university, I knew a great deal about the work of Robert Lucas, whose name will crop up in Chapter 2 of this book, and of his colleagues. I knew they had built on earlier work by Milton Friedman. I was vaguely aware of a

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debate between Friedman's monetarists and James Tobin and his fellow Keynesians, which it seemed the monetarists had won. I was thoroughly taken in by the notion that macroeconomics had progressed to be a genuine science; that my job was to learn to use the tools of this science; that no serious alternative existed; and that Keynes, and anyone who had ever worked with him, was out of date. Keynes had been dead for more than thirty years, and economics had moved on. In the apparently triumphant words of the economist David Laidler (1981, 7), 'we are all monetarists now'.[1]

Like many of my generation, and of the next, I had been sold a pup. Macroeconomics had not moved forwards, and the whole discipline of economics was not progressing. It was regressing. It was already in a muddle, and sadly since then, the muddle has only got worse. I did not learn what I had expected to learn, in my naivety. I learned an economics which normally serves powerful vested interests, albeit often without economists being aware this was the case. It is an economics resting on a set of assumptions which, though demonstrably invalid, were convenient both for the development of particular types of mathematical models, and as a justification for the neoliberal transformation which followed, not only in the USA and the UK, but across most of the world.

I was never exposed to the work of Post-Keynesians, like Michal Kalecki, Joan Robinson, Nicholas Kaldor, Abba Lerner, Hyman Minsky, Paul Davidson or Wynne Godley. I never did understand Keynes, or at least not until many years later. We did not so much as mention the ecological limits to growth, as discussed in the Club of Rome report (Meadows et al. 1972). There was nothing from the then newly emerging literature of behavioural economics. We certainly did not discuss Karl Marx. This is not to say that there were no electives available, where Marx might at least have got a look in. However, by the time you had taken your macro, micro and econometrics subjects, in my masters degree, there was no room for more than one elective. I chose development economics and swallowed even more neoclassical dogma as a result. By then, I had been so badly misled, that I would have objected to anything else.

It took me many years, before I understood that I had been misled. I began to develop an interest in behavioural economics, after the 1987 stock market crash, which undermined my faith in the previously all-conquering efficient markets view of financial markets. Over time, during

a career spent training accountants and bankers, I met the odd banker who suggested to me that the orthodox description of monetary policy could not possibly be correct, and gradually the significance of this began to sink in. Financial crises seemed to be happening more and more frequently. Inequality kept rising in many countries, and trickle-down economics began to seem absurd.

Then, in 2002, I started teaching at the University of Adelaide, which at the time, in Colin Rogers, had a head of school who was a prominent Post-Keynesian. I barely knew such economists existed. I read some of Colin's work (for example, Rogers 1989), which led me on to that of Geoffrey Harcourt (Harcourt 2001, for a good start), the most famous economist ever to work at the University, and to what was for the first time a correct understanding of Keynes. Forgive me for the religious reference, but I felt like a born-again economist. This was what I had wanted to know in 1981, and had lacked both the maturity to discover for myself, and the encouragement to do so from those who had been my educators.

There was still something missing, though. The general equilibrium approach of orthodox economics, which I will reject in Chapter 2, for very good reasons, at least seems to hang together. It is suggestive of the approach to economic management which the great majority of economists, politicians and pundits continue to take for granted, to this day. Post-Keynesian economics seemed to me to lack the internal consistency and power to ever challenge orthodox economics with much prospect of success. To change the direction of our societies from a path of neoliberalism towards one of equitable and sustainable prosperity, something was missing.

That something is modern monetary theory. I was originally introduced to modern monetary theory by Philip Lawn, who is Australia's leading ecological economist, and a pioneer of a metric of economic development called the Genuine Progress Indicator. Phil was a colleague of mine at Flinders University, in the middle of the last decade, and persuaded me to start reading Bill Mitchell's *Billyblog*. William Mitchell, from the Centre of Full Employment and Equity, in Newcastle, New South Wales, is not only one of the principal developers of modern monetary theory, but also a candidate for the title of the world's best living economist. However, despite reading his blog, I remained something of an MMT sceptic until the collapse of Lehman Brothers, on 15 September 2008. It was that event, and the events that followed

it, which led me to read voraciously all the modern monetary theory I could lay my hands on, as well as books and papers by Hyman Minsky and Paul Davidson, and by Michal Kalecki and Keynes himself.

As you can see, I am a slow learner. It took years for me to think about and understand the main elements of an economics for sustainable prosperity. Modern monetary theory is central to such an economics. It is, in my opinion, a genuinely beautiful set of ideas, concepts and principles; elegant in its simplicity; powerful in its validity; profound in its significance; revolutionary in its implications; and for many people, transformational in its impact on their thinking. For me, it lies at the centre of a broader set of ideas, arguments and discoveries, drawn from a variety of disciplines and perspectives, which hold out the hope that we can harness this interconnected knowledge to deliver a future economy characterised by sustainable prosperity. We can do much better in the future than we have ever done in the past.

Escaping from the Old Ideas

More and more people are learning about modern monetary theory; asking questions about it; discussing it with others; using it to distinguish truth from fallacy in a variety of economic debates; and applying it to make sense of the appropriate role for governments to play in pursuit of genuinely sustainable and equitable prosperity. It is close to a tipping point, beyond which it will become impossible to ignore. There is a great deal of momentum behind it.

This is just as well, as the dominant, orthodox wing of the economics profession stands in the way. The barriers to fundamental change in the economics profession are very high. Heterodox economists have been trying to challenge the prevailing orthodoxy for many years, with little practical success, even when the evidence has been clearly in their favour. They have often been sidelined and ignored.

It seems, then, that a large part of the impetus for any such change has to come from outside the economics profession, so that the mass of the profession is eventually forced to wake up and think again about much that has long been taken for granted. This book is meant to be a small push in the direction of change. While I hope it is a good read for economists, of both the heterodox and the more open-minded orthodox varieties, it is intended just as much for activists and policy-makers with an interest in economics. I hope for some people it will be a short

cut. I would not like you to have to go through such a long process of transition as I have done. I hope it is accessible to all, useful to many and I hope it doesn't make economics seem like brain damage.

That is exactly how economics was described by the environmental activist, David Suzuki, in a 2011 documentary movie.[2] Economics, however, is obviously just the study of the economy. The economy is the set of natural and fabricated resources, institutional arrangements, organisations and markets which are available to meet our needs and to influence our current and future well-being. It is something which we have created and which we can and will change, for better or for worse. Like all institutions, it evolves over time, and not necessarily in ways which are conducive to genuine progress. It has evolved, and been managed, in such a way as to push us beyond our planet's ecological frontier, while at the same time in many countries failing to provide the social foundations for shared prosperity.

You could say the same thing about economics as a discipline. It has evolved in a way which has not been conducive to the well-being of people and the planet. To state that millions have been lifted out of extreme poverty is not much of a defence for economic orthodoxy. Many millions still live in want and insecurity in a struggle for survival, in a global economy with the technology to make this unnecessary. And all the while we are using, according to the Global Footprint Network, such a high level of ecological resources that we would need 1.7 Planet Earths for this to be sustainable in the long term. If every individual on the planet consumed resources at the rate of the average American or Australian, we would need 5 Planet Earths. We have, since the 1970s, unnecessarily gone well beyond our planetary boundary for resource use, partly because orthodox economics has encouraged our leaders to concentrate on goals which are largely irrelevant to human welfare, and to ignore those things which really matter. Even in America and Australia, relative poverty has increased, as inequality has been allowed to rise to levels not seen since before World War II. Many of the changes which have happened in the USA and elsewhere over the past 30 years have been destructive rather than progressive, and for that, the economics profession shares a great deal of the blame.

So it is understandable that a lot of people have lost faith in economics, and might echo Suzuki's words. Much of the economics done over a long period has been, if not brain damage, at least a form of brainwashing, and this is true of virtually all the work done within

orthodox macroeconomics since about 1980. The good news is that this brainwashing is not irreversible. If you have had too great an exposure to it, and feel yourself to have been damaged as a result, then this book is offered as a remedy. If you have so far avoided being damaged, then please see the book as a form of inoculation. Once you have read it, you will be able if you wish to read a wide variety of mainstream texts, or to engage prominent conservative economists in debate, with no fear of being misled. Instead, you will be amazed that they could have been so wrong about so much that matters over such a prolonged period. You will wonder how this is even possible.

To describe all economics as 'brain damage', though, is silly and potentially self-defeating, whatever your form of activism. To quote John Maynard Keynes, once again from the last page of *The General Theory*, 'the ideas of economists and political philosophers, both when they are right and when they are wrong, and more powerful than is commonly understood'. Now, as much as at any time in history, it is important for as many people as possible to engage with economic ideas, and to identify which seem to be right and which are wrong. At the very least, we can then, as Joan Robinson put it, 'avoid being deceived by economists'—by the wrong sort of economists, in any case. Because the right sort of economics can be a force for good, and help to deliver a genuinely sustainable prosperity.

In his brilliant popular science book, *A Short History of Nearly Everything* (2003), Bill Bryson described the reluctance of leading geologists over many years to accept, or even to take seriously, the notion that the continents are not fixed in place, but drift and collide over time. It took more than fifty years for plate tectonics to be accepted as valid, despite the fact that generations of children had by then noticed that the continents in places seem as if they would fit together like pieces in a jigsaw, and that there was overwhelming scientific evidence of continental drift. For half a century, plate tectonics was not something in which a respectable geoscientist could believe. It is not only in economics that the great majority of the supposed experts in a field can be badly wrong about fundamental issues over a long period.

Imagine that the economic well-being of billions of people had relied on the theory that the continents are fixed in place. The consequences could have been disastrous. They might have included growing inequalities and insecurities in many countries; long-term unemployment and underemployment; rising household indebtedness; financial fragility; and

dangerous climate change. All this may have gone along with growing political unrest, terrorism, the rise of the alt-right, and public disillusionment with mainstream politicians and their advisors. David Suzuki might have described the work of these scientists as 'brain damage'. He would of course have been wrong to describe the whole of geoscience in those terms.

It will be obvious once you have read this book that for many years, the majority of economists have doggedly maintained and built upon a core model of the economy which has been no more reliable than the theory that the continents are fixed in place, but far more difficult to displace, and with precisely the consequences described above. So dominant is this orthodoxy that David Suzuki might imagine it to be the only approach to the study of the economy in existence. Fortunately, it isn't. There is a better alternative.

My purpose is to identify and explain the main elements of a new approach to economics which will help us to achieve sustainable prosperity, allowing 'all individuals a decent quality of life with dignity and the opportunity to be a member of an inclusive, participatory and just society'.[3] This approach has different roots, different characteristics and suggests radically different policy options to the economics which has dominated global discourse in recent history. Inequality, insecurity, poverty, unemployment, financial instability and ecological crisis have multiple causes, but an important contributory factor to them all, and to the social problems which are derived from them, has been the discipline of economics as practised by the great majority of the profession in recent decades. Economics can be a force for good or ill, but has too often in the past been the latter, acting as a barrier to genuine and widespread progress. This book is a search for an economics which will contribute towards, rather than frustrate, sustainable prosperity and so be a force for good.

Two Traditions

Let us begin with a distinction between two very broadly defined approaches to doing economics. We might regard them as traditions. They are so broadly defined that it has been possible for the entire economic debate that many outside the profession, including David Suzuki, and even some within it, have ever been exposed to, to fall entirely within the first of them.

According to the first of these traditions, the economy revolves around and is controlled by you and people like you. What is produced is what you want to consume. It is produced, before being traded in markets, using your labour and using capital goods, or machines. Natural resources, including energy, are either ignored or treated as a form of capital good. There is very little discussion of ecological sustainability. Growth is good—it means there are more goods and services for you to consume.

It is assumed that you choose how much to spend and save out of your current income, or how much to borrow, based on your well-established preferences and well-informed foresight as to your future needs, opportunities and risks. You are free to choose[4] how much of your time to use for leisure, and how much time to spend in paid employment, again based on your preferences. The amount you earn depends entirely on how productive you are and on the number of hours you choose to work. You love to consume, but you hate to work. If you are unemployed, at least for longer than the time it takes the economy to recover from occasional random shocks, this is your choice.

There are a few frictions[5] and so-called externalities,[6] including pollution and the emission of greenhouse gases, disturbing what would otherwise be a perfectly efficient economy, but otherwise, a free and competitive market economy provides the best of all possible worlds,[7] given the behaviour of people like you. If there are things about the world you don't like, that is the fault of people like you. You have all the power. There isn't very much that governments need to do.

According to the second tradition, if you are a typical worker, people like you have very little control over the way the economy works. Entrepreneurs and corporations might hire you if they are confident they will be able to make enough profit from doing so to make it worth their while. Those entrepreneurs and corporations are operating in an uncertain economic environment. The amount you earn is largely dependent on the bargaining power you possess, rather than on any measure of productivity. Whether you have a job, and how secure that job appears to be, is something over which you probably have no direct control. What is available for you to buy in the shops is what those corporations think they can persuade you to buy.

The pursuit of a standard of living comparable to those around you, and you do tend to compare yourself with people living around you, can lead you into debt. Involuntary unemployment can have severe and

long-lasting psychological effects. The economy can be a very unequal place. Growth has benefits, but it also has costs, and it is potentially unsustainable if it pushes economic activity beyond our planetary ecological boundary. Governments have a responsibility to keep the economy close to full employment, to limit inequalities of income and wealth, to ensure everyone can meet their basic needs without being forced into debt or exploited, to maintain the natural environment for current and future generations, and to work towards some form of sustainable prosperity.

It is the first of these traditions which has up to now been dominant. It is often labelled as mainstream, orthodox or neoclassical economics. If you have been an economics student at any point since about 1980, then unless you are very lucky, virtually everything you were exposed to in what passed for your education came from within this tradition. It includes what many people call Keynesian economics,[8] though not, as we shall see, the economics of Keynes, as well as including Monetarism. It includes Neo-Keynesians, New Keynesians, New-Monetarists and real business cycle theorists. It includes those who have advised Republican presidents and those who have advised Democrats. They are all from the same tradition and have far more in common than what divides them, at least in so far as their views on the correct way of doing economics are concerned.

At least on average over time, they all agree the economy will be close to its full employment level of activity. They all believe governments should balance their budgets in the long run.[9] They generally think that if you are on a low income, while this is unfortunate, it is a reflection of your low productivity, and the only solutions are to train you to a higher level, or to find ways to motivate you to be more productive. If you have a low wage or are unemployed, it is a problem with you. The economy revolves around you. It must be your fault.

In Chapter 2, for reasons which will be explained there, this dominant tradition will be labelled real analysis, despite its lack of realism. For the moment, I will call it *soft economics*.[10] Soft economics will play no role in our foundations of an economics for sustainable prosperity. Those who practise soft economics, however, remain at the helm of central banks and finance departments worldwide. Their grip on power is perhaps very slightly looser than it was before 2009, but they still dominate the overwhelming majority of university economics departments; control leading academic journals to the exclusion of work produced by those from outside

their tradition, and act as gatekeepers to careers in economics within major policy institutions. They normally hire people just like themselves, and so are self-perpetuating and self-reinforcing. They are usually defensive of their tradition and dismissive of those working outside their tradition.

But there is another tradition, and there have always been some economists working wholly or largely within the other tradition. It goes by the name of heterodox economics and includes people who call themselves Post-Keynesians, and a variety of others who fall outside what remains at the moment the orthodox approach to doing economics. In Chapters 2 and 3, we will give it the label of 'monetary analysis', but for the moment, it can be called *hard economics*.[10] Sustainable prosperity will be built on 'hard' foundations, and not on 'soft' ones, with a recent contribution to hard economics known as modern monetary theory playing a central role in the new economics for sustainable prosperity for which we are searching. In Chapter 3, we will see that Keynes is a central figure within this tradition, and that those who call themselves New Keynesians have little or nothing in common with the economics in Keynes.

Soft and Hard Economics

The words 'soft' and 'hard', in this context, have nothing to do with how difficult the approaches are to learn and to apply, or how harsh the policies advocated by economists from within each tradition might be. Instead, the words refer to the realism, or lack of it, of the assumptions on which economic theories and models are built. Their use, in this context, is drawn from a recent book on neuroeconomics (Glimcher 2011).

In soft economics, realism is ignored, and the only concerns of model builders are whether the predictions of their models appear to them and their colleagues to have value, and the conformity of their methods with the currently dominant view of the correct way to do economics. If the techniques are standard and the predictions are seen as useful, the realism of the assumptions used to build the model is of no consequence. The soft tradition lends itself to mathematical theorising, and so attracts to the profession people who are easily impressed by mathematics, and less interested in realism. In turn, this biases the profession towards a model of the economy which tends to be supportive of a laissez-faire approach to economic management. Those doing soft economics typically deny that ideology has any role to play in their theorising, seeing themselves as objective scientists, but they abuse the scientific method,

albeit unintentionally, and are wrong to argue that economics can ever be a values-free discipline.

Those doing hard economics take an interest in how and why real people behave the way they do, and how economic institutions and processes actually work and evolve over time. Hard economics is 'because' economics. It is not just about making predictions, but about building a useful map to guide policy-makers through a complex economic landscape. Those doing hard economics make regular use of insights from a wide variety of other disciplines, within the other social sciences and outside them. Psychology, sociology, anthropology, history, law and even neuroscience are among those disciplines which are potentially important to hard economics.

Conversely, soft economics is 'as if' economics, where a set of often wildly unrealistic assumptions are accepted, and it is then standard practice to explore mathematically how the world would work if those assumptions applied, and to imagine that such predictions have relevance to a world where those assumptions clearly do not apply. Nobel Prize-winning economists from within this tradition, and the great majority of Nobel Prize-winning economists come from within this tradition, have dismissed disciplines like neuroscience, and issues like the limitations a decision-maker with a human brain might face, as being irrelevant to an economist.[11] At best, there is a grudging acceptance that other disciplines might sometimes have relevance to economics, but not where they contradict axioms economists hold dear. There have been some changes for the better, but not so as to fundamentally threaten the way macroeconomics is done.

I want us to go on a journey from the economy we have today to an economy of sustainable prosperity. Economic models and theories which are fit for purpose should provide us with a map to help guide us to our destination. Useful maps are not completely realistic reproductions of the regions they are supposed to represent. In a similar way, economic models can never include every detail of what influences human behaviour, or of the structure of the economy and its institutions. All models and all maps must be 'wrong', in the sense that they are not identical to that which is being modelled or mapped.[12] Those who practise soft economics take comfort in this fact, and sometimes claim on this basis that a search for realism is misplaced.

Advocates of hard economics can only agree that models require simplifying assumptions to be of any use. However, as my former head of

school Colin Rogers says, if you are trying to find your way across New Zealand, what you want to guide you is a simplified representation of New Zealand, and not a map of Tolkien's Middle Earth.[13] Don't expect to find your way across New Zealand using a map of Middle Earth. Don't expect to anticipate a global financial crisis and a Great Recession, or to plot the best path out of that recession, or to achieve sustainable prosperity, using soft economics.

In other words, for a model to be useful, it must share at least some of the characteristics of what it is supposed to represent. In a hard economic model, any assumptions you make must be justified. They may be assumptions which could be relaxed without changing the predictions of the model; they may be assumptions which specify the precise circumstances under which the model is useful to policy-makers; or they may be assumptions which exclude factors playing no significant role in the processes the model describes.[14] If they are none of these things, you are not doing hard economics.

It comes as a surprise to a lot of people that there are these two very different approaches to the study of how economies work, what drives their evolution over time, and what role, if any, government policies can play in ensuring economic outcomes serve the public purpose. It should be a greater surprise that the dominant tradition is that of soft economics, for no better reason than it is more susceptible to mathematical theorising and to ideological bias.

Soft economics, as it is taught in the majority of universities around the world, and practised in governments, central banks and international agencies, limits the range of economic policy proposals which can be given serious consideration, and consequently biases policy outcomes. Paul Samuelson was one of the founders of modern-day soft economics, as well as the author of the best-selling economics textbook in the history of the discipline, and the intellectual father or grandfather of almost all the texts used in universities and colleges around the world subsequently. He said, 'I don't care who writes a nation's laws—or crafts its advanced treatises—if I can write its economics textbooks'.[15]

Hyman Minsky, who made major contributions to hard economics, once wrote that 'The game of policy making is rigged; the theory used determines the questions that are asked and the options that are presented. The prince is constrained by the theory of his intellectuals'.[16]The options that are presented to 'the prince' almost always exclude policies which would contribute to sustainable prosperity, because of the soft

economics being used. The game is rigged and has been rigged for a long time.

Ronald Coase, like Samuelson a Nobel Prize winner, said that 'knowledge will only come if economics can be reoriented to the study of man as he is and the economic system as it actually exists'.[17] Soft economics is neither the study of people as they are nor of the economic system as it actually exists. It is for the most part fake knowledge. The increasing softness of macroeconomics over the past 40 years has been a collective intellectual failure with profound consequences. This is why we need to search for a modern version of hard economics to replace the modern-day orthodox macroeconomics which is still today being used to rig the game. Economics as a profession really does need to undergo a revolutionary change, and the evidence of this need is not hard to find. It lies in the multitude of false and misleading statements of advisers and policy-makers in all major economies in recent years, and also in the acquiescence and often endorsement of neoliberal ideology by orthodox economists.

The recent record of soft economics, and especially soft macroeconomics, is so poor and its implications so misleading, that it is hard to know where to begin, but given its disastrous last decade, the central bank of the Eurozone is as good a place as any.

In 2010, the then Chairman of the European Central Bank, along with a number of leading American and European economists, claimed that austerity could not cause a recession, and that a fiscal stimulus could not bring about economic recovery in an economy with high unemployment. This was classic soft economics, in that there is no credible evidence for either statement, and they are both based on a logical outcome within a model based on completely unrealistic axioms. In other words, these statements are nonsensical. And yet these were the words of Jean-Claude Trichet—'the idea that austerity measures could trigger stagnation is incorrect'.[18]

Subsequently, the European economy as a whole stagnated for years, and in those countries forced into the most severe forms of austerity, as a condition for remaining in the Eurozone, there was worse than stagnation. Even the International Monetary Fund has now accepted that, when used, fiscal policy has in recent years been shown to be more powerful than it had expected.[19] There was an entirely unnecessary depression in the Eurozone, from which Greece, in particular, may never properly recover. The scars are permanent.

The USA, unlike Greece, or Spain, or Italy, or France, is a monetary sovereign. Its currency-issuing government can never be forced into insolvency. Nevertheless, the most recent Federal Reserve Chair Janet Yellen has said that the government's debt 'should keep people awake at night'.[20] Only if they are badly misinformed should they lose any sleep. The scale of the government's debt, which can equally well be seen as a safe financial asset for the private sector and the rest of the world, will never lead to a financial crisis. Soft economics misleads you into the trap of seeing the government as facing essentially the same financial constraints as a household. If it misleads the Chairman of the Federal Reserve, it is no wonder hardly anyone else understands the vital difference between being a currency issuer and a currency user.

The Congressional Budget Office, which is full of orthodox economists, uses phrases such as 'the challenges posed by the amount of federal debt held by the public', as if the savings of the public in US dollars are a challenge, rather than a good thing, and in 2016 published '115 options for reducing the deficit'.[21] The Office did not describe these options as '115 options for reducing the private sector surplus', even though that is what they are. The government's deficit, like its debt, has nothing in common with the debt of a household, and cannot be interpreted to be good or bad, taken out of context. However, governments normally run deficits. Without them, everyone else cannot run surpluses. Looked at in this way, the aim of a monetary sovereign government should be to run as large a deficit as is consistent with non-inflationary full employment. This is a notion that many a modern orthodox economist finds as easy to accept as a 1950s geoscientist confronted with the statement that the continents drift. Yet it is the truth.

There are many other examples we could list, such as the complacent words of Robert Lucas that 'the central problem of depression-prevention has been solved, for all practical purposes'[22]; Olivier Blanchard's ill-timed statement that 'the state of macro is good'[23]; or Ben Bernanke's description of the US economy not long before the crash of 2008 as the result of a 'great moderation',[24] oblivious of a gathering financial storm.

Rescuing Macroeconomics

Something is up with economics, and especially macroeconomics, as it has long been taught and practised within the dominant tradition. As Paul Krugman said in his New York Times blog, in response to

Blanchard, 'The state of macro, in short, is not good'.[25] Willem Buiter wrote in the Financial Times, soon after the crash, of 'the unfortunate uselessness of most "state of the art" academic monetary economics'.[26] He went so far as to argue that most Ph.D. level economic education over the previous thirty years had served to weaken the discipline, rather than strengthen it. Paul De Grauwe, in the same publication a few months later, opined that 'the science of macroeconomics is in deep trouble'.[27] Charles Goodhart, at roughly the same time, accused orthodox economists of 'a steadfast refusal to face facts', while writing of 'the continuing muddles of monetary theory'.[28]

These are not obvious revolutionaries. There are few more eminent economists than Krugman, Goodhart, De Grauwe and Buiter, and with the exception of Charles Goodhart, they are commenting on a tradition of which they are themselves in some ways still prominent members.

A dramatic shock wave was created by Paul Romer, until recently the Chief Economist at the World Bank and for some years a strong candidate for the Nobel Prize, in his paper 'The Trouble with Macroeconomics' (Romer 2016). He argued that state of the art orthodox macroeconomics has not progressed as a science over the past 40 years, but rather become more obscure, cloaked in mathematical symbols, and descended into something like alchemy or mysticism.[29] This is the economics which still guides policy-makers worldwide. It is based on a mistaken philosophical approach to doing economics. It is not fit for purpose in the twenty-first century. We need to replace it.

The great majority of this book is forward-looking and positive. It is not a long discussion of the limitations and failures of orthodox, or mainstream, or neoclassical economics. The focus is on the construction of something more useful, to put in its place. The building work has already largely been done. It is just a matter of selecting the most useful elements and bringing them all together, in a narrative, which is what I have tried to do. However, we need to understand what it is we are seeking to replace, why it has been so persistent in spite of its deficiencies, and why it is so important that it is replaced. This is the business of Chapter 2. It is something which we need to attend to, before we start on our path towards a modern monetary theory for sustainable prosperity.

If we do not get our economics right, we will not achieve sustainable prosperity. Getting the economics right means doing hard monetary

economics, not soft economics. While there were contributions to hard economics before the 1930s, by people like Thorstein Veblen[30] and in some respects Karl Marx,[31] the first serious attempt at the hard economics of monetary analysis was the work of John Maynard Keynes, particularly his *General Theory of Employment, Interest and Money* and his later writing. We will begin putting together a hard economics for sustainable prosperity in Chapter 3, with a discussion of what we can take from Keynes, and from his colleagues, their students and others who developed Post-Keynesian economics, in the years following his death.

A central concern of this book is a discussion and evaluation of modern monetary theory, and its role, alongside insights derived from modern behavioural economics, in building a future offering everyone 'a decent quality of life with dignity and the opportunity to be a member of an inclusive, participatory and just society'. Chapter 4 provides our behavioural foundations, drawing on the work of modern behavioural economists and contrasting this field with the inadequate psychological foundations of orthodox neoclassical economics. Chapter 5 is an explanation and discussion of the axioms of modern monetary theory; of the institutional realism of these laws and axioms; and of their implications for economic management. Chapter 6 provides a workhorse analytical macroeconomic model, within which the principles of modern monetary theory can be demonstrated, and which, it is argued, should replace the orthodox models currently employed by most central bankers and treasury economists. Chapter 7 is a discussion of job guarantee schemes, and of their significance to modern monetary theory, and to the construction of an economy offering everyone an opportunity of an independent and secure life with a good standard of living, while insuring we respect our ecological constraints.

Some of the essential elements of an economics of sustainable prosperity are reviewed in my final chapter. A broadly defined, behavioural and ecological form of modern monetary theory will allow us, and even encourage us, to introduce the policies we need, and to make the necessary institutional changes, to provide everyone with an opportunity of living a full and engaged life, within an equitable and inclusive community, while defending and maintaining natural ecosystems so that today's prosperity does not threaten the well-being of future generations.

All this is possible. The future does not have to be a rerun of the past. An orthodox macroeconomics, which has been going backwards for more than three decades, is ripe for replacement. The economic

policies which that failed macroeconomics has supported have undermined both social stability and ecological sustainability. We can and must replace orthodox macroeconomics, just as we can and must reverse many of those economic policies. We can—you can—play a part in building a future of sustainable prosperity.

It is up to us.

I hope you enjoy the book.

Notes

1. David Laidler has for many years been one of the leading monetarist economists. His words echoed the statement 'we are all Keynesians now', which have been attributed, somewhat misleadingly, to both Milton Friedman and Richard Nixon.
2. This (Canadian) movie was called *Surviving Progress*.
3. This is the definition of *sustainable prosperity* suggested by the editors of this series of books, on behalf of the *Binzagr Institute for Sustainable Prosperity*.
4. *Free to Choose* was the title of a very influential book (and television series) by Milton and Rose Friedman, published in 1980.
5. *Frictions* is a term used by orthodox economists to refer to anything they believe might prevent the economy from reaching an ideal allocation of resources and full employment. For example, Milton Friedman saw a legal minimum wage rate as a friction.
6. *Externalities* are costs and benefits due to economic activity falling on third parties. So, for example if Sam produces a good, Jane consumes it, and Jean is harmed in some way by the process, perhaps due to the emission of a pollutant, then there is an externality (a negative one, in this case).
7. At least, it leads to an outcome which is *Pareto efficient*. This means a situation where it would be impossible to make one person better off without making at least one other person worse off.
8. What most people think of as Keynesian economics is what will be described as Neo-Keynesian economics in Chapter 2. Keynes was not a Neo-Keynesian. The economics of Keynes will be discussed in Chapter 3.
9. There is among orthodox economists a divide between *deficit hawks*, who believe governments should always avoid deficits, at least outside wartime, and *deficit doves*, who believe governments should run deficits during and immediately after recessions, but balance their budgets across economic cycles. Our economics for sustainable prosperity will lead us to reject both these views of fiscal policy. We will be *deficit owls*.

10. The distinction between soft and hard economic theories is drawn from Paul W. Glimcher's, *Foundations of Neuroeconomic Analysis* (2011).
11. As in *The Case for Mindless Economics* (Gul and Pesendorfer 2008).
12. The statement that 'all models are wrong' is usually attributed to the statistician George Box (1976). However, he also asked, 'how wrong do they have to be to not be useful?' That is the question.
13. Colin Rogers' so far unpublished paper, *The State of Macroeconomics: A post-mortem*, written in 2017, uses this Tolkien-inspired analogy.
14. The three valid justifications for incorporating assumptions in economic models are listed in Steve Keen's, *Debunking Economics* (2001).
15. According to Samuelson's obituary in the *New York Times* (Weinstein 2009).
16. *Stabilising an Unstable Economy* (Minsky 1986, 110).
17. He said this very late in life, in an article entitled 'Saving Economics from the Economists', which appeared in the December 2012 issue of the *Harvard Business Review*. He also said, in the same article, that 'the degree to which economics is isolated from the ordinary business of life is extraordinary and unfortunate'. If only he had not waited until he was over 100 years old to say such things!
18. *Reuters Business News*, 24 June 2010.
19. Blanchard and Leigh (2013).
20. In her testimony before Congress, on 29 November 2017.
21. *Options for Reducing the Deficit: 2017–2026*, Congressional Budget Office.
22. Lucas (2003, 1).
23. Blanchard (2008).
24. In a speech delivered at the meetings of the Eastern Economic Association, Washington, DC, 20 February 2004.
25. *New York Times* blog of 18 June 2013.
26. *The Financial Times*, 3 March 2009.
27. *The Financial Times*, 21 July 2009.
28. Goodhart (2009).
29. Delivered by Paul Romer on 5 January 2016, as the *Commons Memorial Lecture of the Omicron Delta Epsilon Society*. Forthcoming in *The American Economist*.
30. Veblen was the founder of Institutional Economics; the author of *The Theory of the Leisure Class* (1899); coiner of the term 'conspicuous consumption'; and author of the brilliant paper 'Why is Economics Not an Evolutionary Science?' in the *Quarterly Journal of Economics* in 1898, among much else. Veblen did 'hard economics'.
31. It is obvious the Karl Marx cannot be summed up in a footnote. However, it is in terms of his influence on monetary circuit theory, which is related to and consistent with the modern monetary theory approach

to macroeconomics described in Chapter 5, and on Kalecki's theory of income distribution, which will be discussed in Chapter 3, that Marx is important to an economics for sustainable prosperity.

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CHAPTER 2

‘Real’ Analysis of an Unreal World

The dominant view of orthodox macroeconomics, up to at least 2008, was one of linear progress. Models and techniques had supposedly got better and better down the decades so that central bankers were now able to deliver a ‘great moderation’ through their skilled manipulations of official interest rates, and the problem of economic depressions had been solved. The best thing for governments to do was to balance their budgets across economic cycles; to allow central bankers to worry about macroeconomic management; to concentrate on resolving what orthodox economists defined to be market failures; to rely on the market to get incentives right, with no policy-induced distortions; and otherwise to stay well out of the way. Neither inequality nor the ecosystem were of central importance. Growing the economy was all important.

An alternative view is that macroeconomics had essentially gone round and round in circles for over a century, had become increasingly unrealistic and misleading in the past 30 years, and was a failed paradigm which desperately needed replacing. This is my view. Orthodox macroeconomics is the soft economics of a ‘real economy’ barter system, and it needs replacing with a hard economics of a realistic monetary economy, located within a natural system, and needing to be managed.

This chapter provides a brief and necessarily incomplete and subjective description of the development of the dominant orthodox soft macroeconomics of today from its nineteenth-century roots. It is helpful to begin with a family tree of soft macroeconomics. None of the useful hard

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monetary analysis of future chapters is included in this family tree, and there is no place for the economics of John Maynard Keynes within it, even though his name appears twice (Fig. 2.1).

It is common to refer to virtually all economic writing in the century before the neoclassical revolution of the 1870s as classical economics. Both Adam Smith and Karl Marx were classical economists, though neither of them can fairly be described as practitioners of soft economics. The pioneer of soft economics, defined to be the construction of economic models based on unrealistic assumptions for which no valid justification exists,

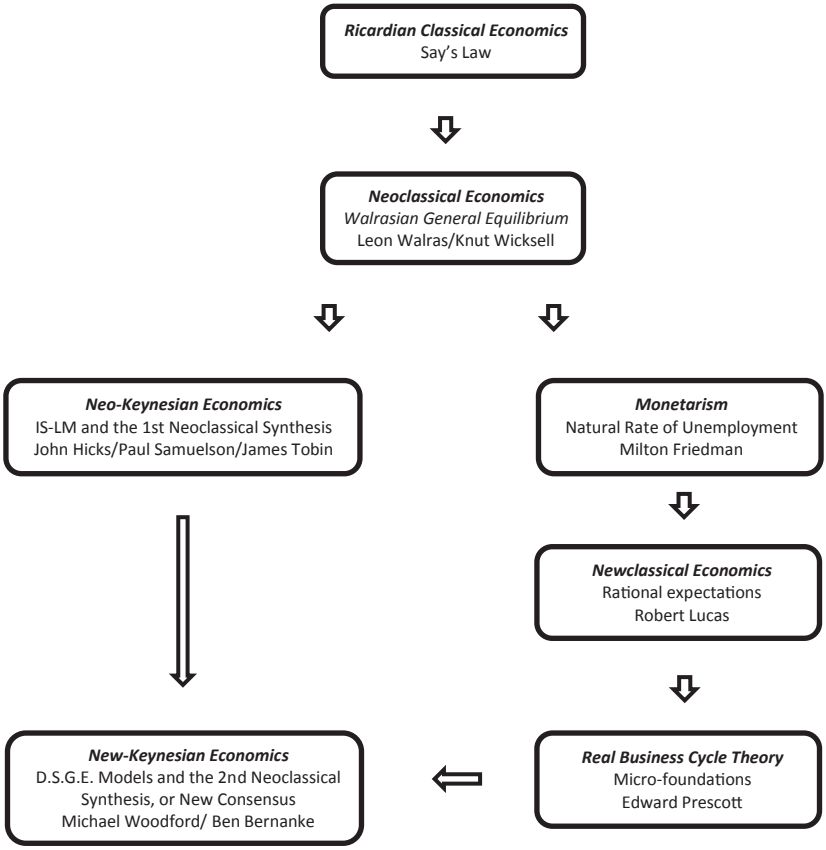

Fig. 2.1 A family tree of soft economics

was David Ricardo.[1] All soft economics from Ricardo onwards incorporates Say's Law,[2] which is often written as 'supply creates its own demand'. Say's Law equates to an assumption of full employment. The neoclassicals reinforced Say's Law by building a logical, mathematical framework within which it was a necessary outcome. Modern macroeconomic models which incorporate a natural rate of unemployment (NRU), or non-accelerating rate of unemployment (NAIRU), follow Ricardo in accepting Say's Law as axiomatic, at least in the long run. They are all examples of real analysis.

Real analysis almost always[3] involves, either explicitly or implicitly, a Walrasian general equilibrium model of a pure barter economy. In such a model, there is no logical place for money and finance. Consequently, when money and finance are introduced into the model, then they are neutral, at least in the long run, meaning they don't affect anything that matters. In other words, neither output nor employment and neither capital accumulation nor technological change are permanently influenced by purely monetary or financial factors. In principle, there is no role for money at all, and bankruptcies and financial crises are difficult to even imagine. Transactions are arranged, and relative prices are set, with the assistance of an entirely fictional mechanism known as a Walrasian auctioneer,[4] or an equivalent device, ensuring the set of relative prices agreed upon is consistent with full employment.

To introduce money into real analysis, it must be assumed that the traders in a general equilibrium economy start to use one of the commodities in the system as a way of pricing all other items and as a convenient means of exchange for them. In this way, commodity money emerges as a solution to the inefficiencies of barter or the inadequacy of the Walrasian auctioneer. However, the money in this story is not a financial instrument and not an invention of governments. Instead, it evolves out of a previously existing barter system of exchange. Moreover, the introduction of this commodity money can change nothing essential about the system, beyond the introduction of a general price level and the concept of inflation, which can be interpreted as a decrease in the relative price of the monetary commodity compared with all other goods.

This 'money' in a neoclassical model is very different from the money of monetary history. While the actual emergence of money in ancient history is not without controversy, there is one thing on which almost all anthropologists, archaeologists and historians of money appear to agree. This is that money did not initially emerge from pre-existing barter systems. A more plausible explanation of how the social institution

of money came to be developed is reserved for later,[5] but it is important at this stage to reject the explanation of the emergence of money from barter given in the great majority of economics textbooks published over the last 150 years.[6]

The prominent anthropologist, Caroline Humphrey, is very clear—'No example of a barter economy, pure and simple, has ever been described, let alone the emergence from it of money; all available ethnography suggests that there has never been such a thing'.[7]

The monetary historian and one-time adviser to the Secretary of State for Wales, Glyn Davies, is equally clear—'On one thing the experts on primitive money all agree, and this vital agreement transcends their minor differences. Their common belief backed up by the overwhelming tangible evidence of actual types of primitive money from all over the ancient world and from the archaeological, literary and linguistic evidence of the ancient world, is that barter was not the main factor in the origins and earliest development of money'.[8]

According to another monetary historian, Shahzavar Karimzadi, 'The pseudo-rationalist inference that money originated as a solution to the cumbersome constituents of barter exchange rests on nothing but false deductive reasoning and unreliable historical evidence'.[9]

Charles Goodhart labels the theory that commodity money emerged from barter as *Theory M* (M for 'metal') and the theory that its origins lie in early governmental institutions as *Theory C* (C for 'chartal'), and finds the evidence in favour of the latter theory far more convincing than that in favour of the former.[10]

While orthodox macroeconomics is a form of real analysis, based on a core model of a barter economy, nothing remotely like that economy has ever existed. It makes no sense to imagine a commodity within this barter system being adopted due to transactions costs, imperfect information or any other inefficiencies which might be imagined within such a barter system. It did not happen, and imagining that money evolved out of such a market system under these circumstances leads to a misunderstanding of what money is, and of the significance of money and finance within real-world economies. This is the foundation myth of real analysis as soft economics. It gave us macroeconomic models where an endogenously driven financial crisis was ruled out by definition, in spite of the fact that such crises have been common historical events.[11]

The economics of Keynes, of the post-war Post-Keynesians and of modern monetary theory is not within the tradition of real analysis. It

is monetary analysis and hard economics. It is potentially both realistic and useful. Monetary analysis is left to the next chapter. Real analysis can never be realistic, and whatever you do to a model of real analysis, it can never be a useful guide to the functioning of a monetary economy. Its foundation myth makes that an impossibility.

In this chapter, I will trace a brief and necessarily incomplete path from the general equilibrium models of Walras and Wicksell through the Neo-Keynesian first neoclassical synthesis[12] of Hicks, Samuelson and others; to Friedman's monetarism and the newclassical revolution of the 1970s; to the real business cycle model which came out of it; and finally to the 'new consensus' New Keynesian second neoclassical synthesis,[12] and modern-day dynamic stochastic general equilibrium models. The important point is that virtually the whole macroeconomic debate since 1945 has taken place using exclusively these models, and that they are all examples of real analysis. They all have Walrasian roots. To differing degrees, they are all misleading, because they are all based on the same core of inappropriate axiomatic foundations.

As recently as the mid-2000s, the notion that there was anything much wrong with orthodox macroeconomics, or that it was anything other than the result of a series of major scientific advances in an increasingly reliable discipline, was heretical. To question the 'new consensus', with its real analysis, general equilibrium foundations was to risk being labelled as a crank. If John Maynard Keynes had still been around, he would have been dismissed by the majority of economists who describe themselves as New Keynesians as a crank, or at best as out of date and irrelevant, which is more or less what happened to those of his colleagues who survived into the 1980s, like Joan Robinson and Nicholas Kaldor. This is not because Robinson, Kaldor and Keynes were fundamentally wrong in their views about how economies work. It is because almost the whole economics profession was wrong to cling to Walrasian economics and to take Walrasian real analysis ultimately to a dangerous extreme.

The New 'Science' of Monetary Policy

By the 1990s, this is what had happened. Central bankers, in particular, congratulated themselves and their immediate predecessors on the achievement of a 'great moderation', by applying the 'new science' of modern orthodox macroeconomics to the conduct of monetary policy.

They put what they defined to be improvements in economic outcomes down to better policy decisions. As Ben Bernanke said, 'I am not convinced that the decline in macroeconomic volatility of the past two decades was primarily the result of good luck'.[13] A paper which is still widely cited as part of the foundations of modern dynamic stochastic general equilibrium modelling was entitled 'The Science of Monetary Policy: A New Keynesian Perspective' (Clarida et al. 1999). Macroeconomics had come of age—a precise and reliable science—to set beside physics.

Bearing this in mind, it is worthwhile listing a number of fallacies that came to be accepted as probable facts within the economics profession, as the Great Recession approached:

- That the slowdown in economic growth and increased inflation of the 1970s could be explained as a failure of Keynesian economics, and that there was no alternative explanation of the economic data of that decade which was equally plausible.
- That Keynesian economics could be equated with wages and/or prices being inflexible; with a relationship between inflation and unemployment called the Phillips Curve[14]; with a fine-tuning approach to fiscal policy; and with a neglect of both monetary policy and the supply side of the economy.
- That the period from 1992 to 2007 could be described as the most successful period in terms of key macroeconomic variables in American and world economic history, and that this could more than anything else be attributed to advances within macroeconomics.
- That financial and other deregulation in a world of increasingly efficient and globalised financial markets could permit sustained economic growth along a stable equilibrium growth path.
- That financial crises were the result of imprudent government economic policies in an economy which otherwise tended towards stable growth, so that financial deregulation was a good thing and rising private-sector debt could be ignored.
- That the unemployment and underemployment of labour were largely an equilibrium condition, influenced by productivity and preferences, and frictions such as search costs, so-called efficiency wages, trade unions, minimum wage laws and labour market regulations. Essentially, unemployment was supposed to be a consequence of real wages being set too high.

- That the problems of economic cycles had been solved, and economists could turn to other issues (Lucas, 2003). These 'other issues' included policies to reward those who already had high incomes, since it was seen as necessary to motivate them to increase those incomes further still, and to penalise those on low incomes, in pursuit of flexible labour markets and low labour costs. This was supposedly necessary to maximise competitiveness.
- That continuing growth in real GDP was the obvious and overriding goal of economic management, and that matters such as inequality and the ecological footprint of economic activity were at best of secondary importance.

These beliefs were not based on any convincing empirical evidence, and for what such observations are worth, rates of unemployment and underemployment were lower and the average rate of growth of real output was higher from 1950 to 1970 than during the so-called great moderation. Moreover, the distribution of income within such economies, which had become slightly more even during the earlier period, became far more uneven during the later one, and while financial systems remained relative robust in the former period, there was rapidly growing financial fragility during the latter.

Taking the USA as an example, it is not clear that the performance of the progressively reformed US economy after 1980 clearly outshines that of the so-called Keynesian 1950s and 1960s. I do not, of course, accept that maximising the rate of growth in real GDP is necessarily a suitable objective of economic management, but they did. The earlier period overall had a higher average rate of growth, less unemployment and lower inflation (Table 2.1).

The most widely used measure of inequality in economics is the Gini statistic.[15] The income Gini statistic for the USA fell marginally during the 1950s and 1960s, reaching a historic low in 1968. The year 1968 was the least unequal year in US economic history. By 1982, the gains of the early post-war years had been lost, and the degree of income inequality of 1950 had been restored. This was just the beginning, however. US inequality increased sharply during the subsequent 30 years, returning the USA to levels of inequality not seen since before the Wall Street Crash of 1929. Moreover, the benefits of economic growth in recent times have gone largely to those at the very top of the distribution—the 1%.[16]

Table 2.1 US real GDP growth; CPI inflation; unemployment; 1960–1916

US data	*Real GDP growth*	*CPI inflation*	*Unemployment*
Period	*Annual average (%)*	*Annual average (%)*	*Annual average (%)*
1950–1959	4.5	1.8	4.0
1960–1969	4.3	2.4	4.8
1970–1979	3.2	7.1	6.3
1980–1989	3.2	5.5	7.4
1990–1999	3.2	3.0	5.8
2000–2016	2.0	2.2	6.3

Source Federal Reserve Economic Data. Federal Reserve Bank of St. Louis.

It was not only in the USA that the economy grew less quickly from the 1980s onwards than during the 1950s, the 1960s and even the 1970s; when a commitment to full employment was taken for granted, policy-making was less subservient to misleading economic theory and consequently came closer to being genuinely Keynesian. The same thing is true in every high-income country, including not only the post-war miracle economies of Germany and Japan, but also the comparative laggards of Australia and the UK.

This is not to say that the economic and social conditions of the 1950s and 1960s could have been sustained or reproduced, or to deny that in some countries those decades reflected growth due to reconstruction and catch-up effects, but it is to suggest that the great claims made for economic policy-making in the late 1990s and the early years of this century were overblown. And all the while, household debt and financial system fragility were increasing, alongside emissions of greenhouse gases, without this being of apparent concern to economists and policy-makers, guided by what they still regard as state-of-the-art macroeconomics, and is often called 'the new consensus'.

Real Analysis of an Imaginary World

This new consensus is also occasionally referred to as the second or 'new neoclassical synthesis', which reminds us that it is the intellectual heir of both the first 'neoclassical synthesis' and the neoclassical foundations of that earlier model. That the model has neoclassical foundations means its roots go back to the Walrasian barter model of the 1870s.

The full-employment property of that model can be traced back further still, to David Ricardo and to Jean-Baptiste Say. It is all soft economics. It is all the real analysis of an unreal world.

According to Keynes, 'Ricardo offers us the supreme intellectual achievement, unattainable by weaker spirits, of adopting a hypothetical world remote from experience as though it were the world of experience and living in it consistently. With most of his successors common sense cannot help breaking in—with injury to their logical consistency'.[17]

The most recent generation among Ricardo's successors are those who have contributed to the modern New Keynesian dynamic stochastic general equilibrium model. There are many versions of it, but they all share the same core and essentially the same logical inconsistencies, which explains my reference to a single model.[18]

The model does not require money at all. In the words of Frank Hahn, one of the leading general equilibrium theorists of the twentieth century, 'The most serious challenge that the existence of money poses to the theorist is thus: the best developed model of the economy cannot find room for it'.[19]

Not only is money unnecessary in a dynamic stochastic general equilibrium model and in its general equilibrium forebears, but according to the logic of the model there is no room for anything approximating to real world money, or for that matter a realistic finance sector, fundamental uncertainty or historical time. These models are, in their purest form, by definition, perfect and friction-free barter models, complete with a Walrasian auctioneer and a timeless auction process, occurring at the beginning of an infinite logical time. There can be no purpose for money in such a model, either in the form of an asset or as a pure unit of account, and consequently a general price level ought not to exist (Rogers 2013). Moreover, there can be no meaningful distinction between real and nominal magnitudes, since the notion of nominal value in a barter system is impossible to define. The discussion of inflation, or the costs of inflation, within such a framework, is challenging, to say the least. Understanding the benefits of forward contracts with pre-determined ('sticky') prices, which exist in reality to stabilise cash flows in an uncertain economic environment, is impossible.

Money may or may not exist in a general equilibrium model, but it is never essential to the model having a solution. If it exists at all, it can only logically exist as a commodity—the medium of exchange which was supposed to have emerged from barter. Some versions of the model

have nothing called money, but still have a unit of value and a price level. Other versions have money, but it is as I have said a mythical commodity money, and such models can never include a realistic description of a monetary system. This is all something of a muddle.

Money, as in the safe and fully liquid liabilities of monetary sovereign governments and their central banks, and the liabilities of commercial banks which are cleared at par using central bank liabilities, and which can be used to discharge tax and other obligations to those monetary sovereigns, does, obviously, exist, in the world in which we live. In addition, realistic monetary and financial institutions and markets have significant and long-lasting effects on the paths of output, employment and the general price level through time. Money can never be 'neutral' in real life, either in the short or in the long run; whereas in a general equilibrium model, if money is there at all, it must exhibit long-run neutrality. It is obvious that the problem lies not with 'the existence of money', but with what neoclassical economists take to be 'the best developed model of the economy'. Something is up with orthodox macroeconomics, and a short description of its historical development shows the muddle has been remarkably persistent—in fact, virtually ever present.

The problem is that almost all macroeconomic theory, in spite of its evolving and deepening architectural complexity, continues, more or less implicitly, to employ as its foundations the same money-less Walrasian barter system of real analysis. It should always have been based on some form of monetary analysis, as money and finance have always been driving forces in capitalist economies. Instead, it has, in spite of the efforts Keynes made in and immediately subsequent to *The General Theory* to change this, continued to be real analysis.

Perhaps the first genuinely macroeconomic model of the economy was offered by Knut Wicksell, in 1898, in his *Interest and Prices*. The use of this same title by Michael Woodford in his description of the 'new consensus', in 2003, is intended to emphasise the essential continuity of thought in macroeconomics over more than a century. They are both within the tradition of real analysis. To me, it emphasises a discipline going round and round in ever-decreasing circles.

Wicksell accepted the Walrasian model of the economy, within which unemployment has no meaning, but was concerned about the manner in which the classical Quantity Theory of Money[20] was commonly appended to the Walrasian barter system, to determine a price level. A commodity called money was introduced into the model, but by

definition changes in the quantity of this commodity could not affect output and employment, since full employment was assured. Moreover, the demand for this commodity as a means of exchange depended in a stable way on the monetary value of transactions within this fully employed economy. An increase in the supply of this commodity would lead to an increase in spending on transactions, but could call forth no additional output of other goods. Therefore, the supply of commodity money determined the price level in what was otherwise a friction-free general equilibrium model of a barter economy. Money was neutral. It affected nothing but the general price level.

Wicksell had a more realistic understanding of the nature of money and banking than many of his contemporaries and was aware that, even with a gold standard, the practical business of central banking concerned the day-to-day management of bank liquidity with the aim of stabilising interest rates at the central bank's desired level. The pure Walrasian barter model naturally lacks even the concept of an interest rate, unless it is imagined that every commodity in the system has its own unique rate of interest.[21] The addition of the Quantity Theory in itself does nothing to rectify this failing.

Wicksell introduced the notion of an aggregate general equilibrium model with endogenous,[19] but still neutral, money. He divided production into consumer goods and capital goods, and income into consumption and saving. The rate of interest would be set at its 'natural' (or equilibrium) level where the equality of saving and investment was consistent with market clearing at a stable price level.

A central bank could reduce the bank rate below Wicksell's natural rate, encouraging investment by entrepreneurs at the expense of savers, but only at the cost of upward pressure on the price level. The natural rate itself, as always in neoclassical macroeconomics, reflects the real marginal productivity of capital (supposedly the real returns on investment) and the marginal rate of time preference among households (the degree to which people are impatient to consume now, rather than later). Wicksell's natural rate of interest fits nicely with Fisher's equilibrium real rate of interest[22] and the loanable funds theory[23] of interest rate determination, in spite of endogenous money. They all assume full employment to be the norm. They all assume that the non-inflationary finance of investment spending requires the prior existence of saving out of income, whereas in reality it is investment spending which creates income for people to save. Like the modern 'state-of-the-art' dynamic stochastic

general equilibrium model when money is included within it, Wicksell's model allows for endogenous money and temporary changes in the rate of interest. However, 'money is a veil', with output and the natural rate of interest determined by real forces which lie beyond the influence of any monetary authority.

It is interesting to note the similarity between Wicksell's interest rate rule, as identified by Woodford, and the modern-day Taylor rule[24] embodied in the recent 'state-of-the-art' models we are about to discuss. Wicksell's rule required the rate of interest to be increased whenever prices had risen, and to be reduced when prices had fallen. There is an implicit price level target here, rather than an inflation target, but otherwise Wicksell's rule is equivalent to a Taylor rule with a zero weight for output gaps ('strict inflation targeting'). They both include a 'natural (real) rate of interest', which is derived from the marginal rate of time preference of households and the marginal productivity of capital. Both Woodford and Wicksell are practitioners of the same tradition of real analysis. Woodford's New Keynesian economics has Walrasian and Wicksellian roots, but has nothing to do with Keynes and *The General Theory*.

Softening up 'Keynesian Economics'

Keynes did not invent monetary analysis. The monetary circuit theory of Marx, which has inspired generations of Post-Keynesians and modern monetary theorists, is an example of monetary analysis which pre-dates Keynes. Moreover, the Keynes of *The General Theory* can be criticised for not consistently or clearly enough emphasising the revolutionary implications of the monetary analysis he advocated to his colleagues.

However, Keynes left no doubt that *The General Theory* was an attempt to shift economics from real to monetary analysis. As such, it marks the first clear discussion of the implications of uncertainty for decision-making, money, finance, effective demand and unemployment in a modern monetary economy. For Keynes, the most significant step in the development of a more realistic and useful model of the economy was the incorporation of fundamental uncertainty and of its implications for the role of liquidity; the functioning of financial markets; the instability of private investment spending; and the potential for prolonged mass unemployment. As we will see, money is central to Keynes' analysis, and you cannot fit a genuinely Keynesian economics into a Walrasian frame.

The General Theory was an attempt to shift economics back from being a 'soft' discipline to a 'hard' one and in that sense was in the tradition of Adam Smith rather than that of David Ricardo. Since it is an example of monetary analysis, further detail does not belong in this chapter, and I will reserve further discussion of the economics of Keynes to Chapter 3.

Though the Keynes of *The General Theory* does not belong in a chapter on real analysis, real analysis is the basis for almost all of what became known as 'Keynesian economics', including both the first and the second neoclassical syntheses, which between them have dominated academia and policy-making for most of the period since 1945.

The undermining of *The General Theory* as monetary analysis started almost immediately, with the development of the IS-LM model by John Hicks.[26] This model provides an analysis of the demand side of the economy as consisting of a goods market, a money market and a bond market. The application of Walras' Law then allows for the omission of one of these markets when comparing equilibrium positions. This leaves the IS (goods market equilibrium) and LM (money market equilibrium) equations as the frame used by almost all economists to understand aggregate demand from the 1940s until at least the 1970s. The financial system is hidden behind the LM curve. This model, or something very close to it, is still the frame used in most undergraduate macroeconomics teaching today and is at the back of the minds of almost all economists. It still guides the thinking of economists like Paul Krugman today.

The IS-LM model was initially seen by Keynes as harmless and even potentially useful, but was the first step in the innocent fraud of real analysis masquerading as the economics of Keynes, which has continued right up to the present day. The IS-LM model has a variety of logical flaws and limitations, not all of which are worth identifying here. The worst omission is that it ignores the role of expectations and fundamental uncertainty, which are central to Keynes' monetary analysis. As Minsky put it, 'Keynes without uncertainty is like Hamlet without the Prince'.[26]

The IS-LM model is deficient in other ways too. It ignores or abstracts from the shifting and interconnected balance sheets which, as we shall see, drive the development over time of financial fragility and financial instability. It separates out the goods market from the money market, when in reality they are inseparable. Further, it encourages a neglect of liquidity, a confusion of stocks with flows and the loanable

funds fallacy Keynes had rejected. Consequently, while it is consistent with the Walrasian analysis Keynes was aiming to replace, it is inconsistent with the 'financial Keynesianism' of *The General Theory*, as explained by authors such as Davidson, Minsky and Keynes himself.[27]

The IS-LM model can be manipulated as a basis for justifying a fiscal expansion in a recessionary period, particularly when interest rates are at what is regarded as their 'lower bound', just as Paul Krugman argued regularly through his *New York Times* blog in the years following the Great Recession. In this respect, Krugman is right to claim that some elements of orthodox macroeconomics can be used to justify sensible macroeconomic policies. However, IS-LM is useless when it comes to identifying the potential for a future financial crisis. As with all orthodox equilibrium models, a crisis can only arise from an exogenous shock. This is not a genuinely dynamic model with the potential for an endogenous private-sector crisis.

Towards the end of his life, John Hicks voiced doubts on similar grounds regarding his own creation, coming to see it as potentially of value in a classroom setting, but of limited use beyond that. In 1976, he wrote, 'I must say that that diagram [IS-LM] is now much less popular with me than I think it still is with many other people. It reduces the *General Theory* to equilibrium economics'.[28]

All that it is necessary to add to the equilibrium IS-LM Model to make it fully Walrasian is perfectly flexible prices. Should a negative demand shock cause an incipient fall in aggregate demand relative to the full-employment real income, the price level in such a model will decrease. This will increase the real value of the money supply and perhaps also the real value of any private-sector net financial wealth which is defined in nominal terms. The first of these effects—sometimes misnamed the Keynes effect—shifts the LM curve to reduce the rate of interest and indirectly to raise spending; the second effect—the Pigou or Patinkin effect—shifts the IS curve to increase spending directly.

Of course, for the reasoning to be fully Walrasian, it is relative wages and prices which have to be flexible. Either route to full employment is sufficient, and they can be made identical by imagining money to be a commodity within a Walrasian system (what else could it be?), so that a fall in the price level equates to an increase in its relative price and a decrease in the relative prices of all other commodities, compared to money.

With perfectly flexible prices, the economy is instantaneously restored to its natural or full-employment state, as if facilitated by an invisible auctioneer who is quick as lightning, or able to practise a repeated re-contracting exercise in a timeless vacuum. Aggregate supply is fixed by the real forces of technology, productivity and preferences, and remains untouched by money, finance, uncertainty and 'animal spirits'. There is no path dependence—what has happened previously has no impact on what will happen in the future, beyond its influence on the current equilibrium position—and no historical time at all.

For a given IS curve, the model retains Wicksell's natural rate of interest within a loanable funds framework, which are concepts rightly rejected as non-existent and unhelpful by Keynes. With flexible prices, there is no role for either fiscal or monetary policy to play in maintaining or stabilising output and employment.

To introduce a role for Keynesian demand management policies, it is necessary to introduce the friction of downward sticky wages and prices, so that real income cannot rapidly return to its natural level following its disturbance by a shock of some kind. If prices are sufficiently inflexible, a negative shock to demand can have long-lasting consequences for output and employment. Under these circumstances, it becomes respectable to argue for an expansionary fiscal policy, when an output gap exists, while never questioning the underlying Walrasian foundations of what remains a model of real analysis, with its long-run full-employment general equilibrium.

There was nothing very revolutionary about this 'bastard Keynesianism' (as Joan Robinson[29] famously put it). Mass unemployment had been a regular feature of capitalist economies in the 1920s and before. Business cycles were not invented in the 1930s. There were plenty of 'Neo-Keynesians' before *The General Theory*. Among them, we can rank the pre-Great Depression J. M. Keynes of the 1920s—the man who said 'In the long run we are all dead',[30] with reference to what is clearly a neoclassical model of sticky prices. Sticky wages and prices are not the cause of persistent unemployment in *The General Theory*, just as they are not normally its cause in the real world, as we shall see in our next chapter.

It is instructive to recall what Samuelson had to say about the introduction of sticky prices into the neoclassical system—'The way I finally convinced myself was to stop worrying about it (about understanding Keynes's analysis)…I was content to assume there was enough rigidity in relative prices and wages to make the Keynesian alternative to Walras operative'.[31]

The greatest of the economists of the first neoclassical synthesis thus admitted that he had stopped worrying about Keynes's monetary analysis and had instead taken the long-established real analysis model of the economy in which he had been educated, and added enough price and wage rigidity to justify Keynesian demand management policies. This is the essence of the neoclassical synthesis.

The discovery of a correlation between inflation and unemployment in the late 1950s, which was named the Phillips Curve after the economist normally credited with its discovery (Phillips 1958), appeared to offer support to the resulting Neo-Keynesian view of the economy, and therefore support for a policy of fiscal fine-tuning (shifting the IS curve), with the aim of stabilising the economy at a point acceptably close to full employment, but without significant demand-pull inflation.

Their neglect of Keynesian uncertainty, and attachment to general equilibrium reasoning, gave the Neo-Keynesian economists of the first neoclassical synthesis of the 1950s and 1960s essentially the same blind spots and over-confidence as their New Keynesian successors would show in the early 2000s. They were unaware of, and uninterested in, the need to redesign and reform institutions to maintain non-inflationary full employment, as social attitudes, the financial system and the world economy evolved over time. They were unable to anticipate, or apparently react to, the stagflation of the 1970s. There had been too much faith in the continuing stability of historical statistical relationships and not enough emphasis on the management of a potentially unstable economy and social system evolving through historical time. They had never understood Keynes.

Meanwhile, during the early years of the first synthesis, the necessary conditions for the logical existence of a general equilibrium system, and the properties of such a system, had been explored by Arrow and Debreu,[32] and others, including Samuelson himself; and the aggregate version of the general equilibrium model, complete with its standard two factor aggregate production function, had been used by Solow[33] to build neoclassical growth theory. Both Robert Solow and Samuelson were leading Neo-Keynesians and also firmly grounded in neoclassical real analysis. Solow has described himself as a neoclassical economist who is content to be labelled as a Keynesian.[34]

Then along came stagflation, the apparent breakdown during the 1970s of the Neo-Keynesian Phillips Curve and the associated failure of Neo-Keynesian econometric models to provide useful forecasts or guidance for policy-makers. There was a crisis in Neo-Keynesian economic theory.

Hyman Minsky was among those to describe the crisis. He claimed it had two aspects: 'one is that "devastating logical holes" have appeared in conventional theory; the other is that conventional theory has no explanation for financial crises'.[35] However, economists did not turn for answers towards the monetary analysis of people such as Hyman Minsky and John Maynard Keynes. Instead, a model which purported to explain contemporary events, and to do so in a manner which was more faithful to Walrasian real analysis, seemed to many an attractive alternative. Economics shifted, not for the first or last time, in the wrong direction. Not from 'soft' to 'hard' economics, but from 'soft' towards, eventually, 'super-soft' economics.

The Chicago Boy

Not everyone had gone along entirely with the first neoclassical synthesis. A monetarist alternative to Neo-Keynesian economics had been championed by Milton Friedman at Chicago from the 1950s onwards. Friedman disputed the impact claimed by Keynesians for fiscal policy on aggregate demand and argued that monetary policy, and in particular control of the rate of growth of broad measures of the money supply, was the key to the management of inflation. Inflation was 'always and everywhere a monetary phenomenon'.[36] In his view, the major source of instability in what should be a stable general equilibrium economic system was mistaken government and central bank policy itself. Friedman talked a lot about money, but never fully understood money, given his Walrasian roots. Milton Friedman certainly never understood banking, but then you can say the same thing for many economists today.

James Tobin[37] viewed the debate between the Neo-Keynesians and the monetarists as a largely technical debate about the gradients of the IS and LM curves within the Hicksian framework, with Neo-Keynesians viewing fiscal policy as being a more effective tool of demand management than monetary policy and monetarists believing that controlling the money supply was all that mattered. For Tobin, it all depended on the relative sensitivity of investment spending and the demand for money to changes

in interest rates. Monetarists supposedly viewed investment spending as more sensitive than the demand for money to changes in interest rates, while for Neo-Keynesians it was the other way around. Consequently, a fiscal expansion not combined with an increase in the money supply would drive interest rates up and 'crowd out' a great deal of private investment, if you were a monetarist. On the other hand, an increase in the money supply, though it might reduce interest rates, might not have much impact on investment spending, if you were a Neo-Keynesian.

Milton Friedman[38] did indeed claim that fiscal policy was an inefficient mechanism for the management of demand, but he denied that this had anything to do with the relative gradients of the curves in Hicks' model. Robert Barro[39] made a similar claim, basing his argument on a notion known as Ricardian equivalence. Briefly, applied to stimulative tax cuts, Ricardian equivalence is the idea that tax cuts today lead far-sighted households to anticipate higher tax liabilities in the future, causing them to save what they perceive to be temporary tax cuts, and frustrate a discretionary fiscal expansion. One of the foundations of Ricardian equivalence was Friedman's Permanent Income Hypothesis (Friedman 1957), which itself is founded on expected utility theory, something we will discuss and largely dismiss in Chapter 4. These theories have proved remarkably resilient in academic economics over a long period, in spite of the evidence that they have no credible empirical support, and are, especially in the case of Ricardian equivalence, beset by logical flaws.

I will explain later that expected utility theory, Ricardian equivalence and not only the practice but even the theoretical possibility of successfully targeting the growth of some measure of the money supply are all at best viewed as 'soft' economics and are better regarded as highly misleading and dangerous ideas when used as a basis for making policy recommendations. They are based on a series of misconceptions, which are mutually reinforcing and consistent with an underlying real analysis, general equilibrium framework.

Among the most persistent and dangerous of Milton Friedman's misconceptions is that of the natural rate of unemployment. In a general equilibrium production system, there will be some 'full employment' or 'natural' level of output, which in a competitive system depends on preferences, endowments and production technology. Real wages depend on the marginal productivity of workers, and optimising workers decide how much to work based on balancing the marginal utility of leisure against the marginal utility from the real consumption which additional labour

supply makes possible. The proportion of workers remaining unemployed voluntarily, because the real wage available in the labour market does not match their reservation, or minimum acceptable wage, determines the natural rate of unemployment. The substitution of the 'natural rate hypothesis' for the concept of full employment has been one of monetarism's most enduring theoretical innovations. Friedman defined it as 'the level that would be ground out by the Walrasian system of general equilibrium equations'.[40]

He argued that by the late 1960s changes in tax and social welfare systems had adversely influenced incentives, and that growing trade union power and a variety of government policies restricting competition had adversely affected productivity. Consequently, the natural rate of unemployment was supposed to have increased. Unemployment was an equilibrium phenomenon—not a market failure caused by price rigidities—and since the unemployment rate was the result of decisions by optimising households and firms, there was no justification for using either fiscal or monetary expansions to reduce its level. Indeed, an increase in the rate of growth of the money supply could only temporarily reduce unemployment below this natural rate, according to Friedman, and consequently could only temporarily increase output above its natural level, by fooling workers about the real value of the available wage. His model predicted people would be fooled into taking jobs during periods of accelerating inflation, because they would over-estimate the real wage they had been offered, and that they would subsequently quit those jobs, once their expectations of inflation had adjusted and they had realised their mistake.

The cost of this was an acceleration in the rate of inflation, which must persist until unemployment reverts to its natural level once again, at which point the inflation rate and inflation expectations will have both increased. This is the basis for the Expectations-Augmented Phillips Curve,[41] which in a modified form remains the aggregate supply function embedded into today's 'state-of-the-art' models.

It is an absurdly counter-intuitive basis for a theory and is flatly contradicted by empirical evidence, in the sense that it implies workers voluntarily quit their jobs during periods of rising unemployment. To Friedman, this was unimportant, as I have already said. He believed firmly in 'soft', 'as if' economics. He was content with the idea that his model could make accurate predictions and uninterested in the realism of its axiomatic foundations.

His definition of natural output and unemployment as levels consistent with stable inflationary expectations, and the replacement of the concept of full employment with that of the natural rate hypothesis, became permanently embedded into orthodox neoclassical macroeconomics. It provided an apparent justification for the abandonment of full employment as a policy objective and for a focus on what became known as supply-side measures, which were supposed to improve incentives and generate productivity growth.[42] Evidence suggests that these measures instead contributed to rising inequality, which has had the opposite effect on growth.[43]

The Congressional Budget Office in the USA publishes an official estimate of the natural rate of unemployment, which is more often these days referred to as the non-accelerating inflation rate of unemployment (NAIRU). If you take their estimate seriously, the good news is that it currently sits below what it is supposed to have been in the 1950s and 1960s.[44] In reality, however, unemployment has often fallen below the CBO's natural or non-accelerating inflation (NAIRU) rate, without inflation accelerating at all. Consequently, the CBO has regularly amended its estimate of what the natural rate is supposed to have been. There is nothing 'natural' about these estimates, and they should not be taken as seriously as they appear to be. The concept itself is merely an artefact of soft general equilibrium analysis. In other words, there is no 'natural rate of unemployment'. Calling it the 'non-accelerating inflation rate of unemployment' might make it appear more plausible, but it does not change the fact. We will examine inflation, unemployment and the potential to eliminate involuntary unemployment without causing inflation to accelerate, in Chapter 7.

From Soft to Super-Soft Economics

If Friedman's theorising was 'soft' economics, it was during the 1970s to be supplanted by 'super-soft' economics. Real analysis becomes 'super-soft' when it incorporates both the rational expectations hypothesis and the real business cycle model of the economy. Taking a model with unrealistic axiomatic foundations and then insisting on pursuing the internal logic of that model to the fullest possible degree creates an absurdity, even if along the way it might generate the occasional potentially useful insight.

Robert Lucas[45] built on Friedman's analysis by replacing Friedman's mechanical adaptive expectations, which allowed for workers to make mistakes by being slow to adapt their expectations of inflation to the consequences of government policy decisions, with the more logically

consistent rational expectations. This was the transition from monetarism to newclassical economics and from a government-induced business cycle to a model with no theory of business cycles at all.

People with rational expectations do not make avoidable errors. They are able to construct approximately correct probability distributions of future economic conditions, using the 'correct' model of the economy of which they are a part for the purpose. They are never fooled by pre-announced government policy decisions. No deliberate and announced acceleration in the rate of growth of the money supply could cause firms or workers to make mistakes in Lucas' model. Only unanticipated changes in the money supply, or shocks from outside the economy, could cause output to deviate from its natural, and optimal, level.

There is no evidence that people have rational expectations and plenty of evidence that they do not. Indeed, in a world of fundamental uncertainty, the form of rational expectations assumed by almost all neoclassical economists since Lucas is an impossibility.[46] This is explored fully in Chapters 3 and 4.

Once economists had gone this far, the final step in the descent into 'super-softness' was inevitable. This involved the explicit mathematical provision of what had always previously been implicit microeconomic roots for 'super-soft' neoclassical macroeconomics in 'soft' microeconomics. In its pure form, it was real business cycle theory.[47]

In one sense, real business cycle theory was a reaction to an obvious empirical failing with newclassical economics. Whereas there was room in the Neo-Keynesian economics of the first neoclassical synthesis for economic cycles, of the mechanical multiplier-accelerator type, where increases in investment drove demand up, and accelerating demand stimulated further net investment, and in monetarism for policy-induced cycles, in newclassical economics, the only possible disturbances to the natural equilibrium are random, non-serially correlated shocks. Uncorrelated shocks do not produce cycles. More clearly than most of these 'soft' neoclassical models, there is no business cycle at all in the newclassical version.

Real business cycle theory provided a solution—cycles as equilibrium phenomena. If cycles in output growth and in employment are a consequence of random fluctuations in productivity growth, and perhaps also in people's preferences between work and voluntary unemployment, then it is possible to combine perfect price flexibility, perfectly competitive markets and perfectly rational expectations, and yet still provide an 'explanation' for business cycles. Such explanations rely on large

pro-cyclical swings in real wages across the cycle; fully 'rational' workers allocating their time between labour supply and leisure optimally over time; and, of course, the tendency for workers to voluntarily withdraw their labour during a recession and regain their willingness to work during a recovery.

Lucas and other newclassicals, and the closely associated efficient market theorists of financial economics, had brought a great deal of additional mathematics into macroeconomics. Real business cycle theory moved the discipline further in the same direction and greatly appealed to the large number of people moving into the profession who preferred a sort of (arguable) beauty over truth. That the theory faced insuperable empirical challenges should have been obvious at its inception. Even its core prediction of consistently pro-cyclical fluctuations in real wages across the cycle is not supported by the data, as is now generally accepted. This is as 'super-soft' as economics can get. It was too super-soft to swallow, even for most orthodox economists.

Following the early 1980s, when, beyond what Lucas and the real business cycle theorists would have predicted, recessions were far more severe, unemployment more persistent and prices apparently more sticky, it was clear to most economists that some concessions had to be made to the data. While a 'soft' model is not based on realistic axiomatic foundations, it must at least provide 'explanations' which can be made approximately to fit real-world evidence. The core axioms could be defended, only by reintroducing whatever 'frictions' might be required to retrofit the model to the data.

The majority of the profession had been impressed enough, and perhaps intimidated enough, by the mathematics and imagined logic of real business cycles, that it was widely agreed that the real business cycle model and its approach to microfoundations had to remain the basis of any acceptable new model. Unfortunately, this restricted the options available to economic theoreticians and to those basing policy advice on orthodox theory. It consequently did the same to Minsky's prince, constrained as he was by the theory of his intellectuals.

It was no longer acceptable to build a model without rational expectations. Post-Keynesians like Hyman Minsky drifted from the fringes of economic debates into obscurity. It wasn't just that the age of Keynes was past. Even Milton Friedman was by now seen as part of the history of economic thought, rather than a current participant in its ongoing development, because his work largely predated the rational expectations revolution.

The Second Neoclassical Synthesis

The second, or new, neoclassical synthesis, as it became known, might be dated from a paper by Stanley Fischer,[48] which brought 'sticky' wages back into respectable economic discourse. There followed many contributions to a New Keynesian economics, which developed into an even more dominant school than the Neo-Keynesian economics of the first neoclassical synthesis. They introduced all the same frictions present in the earlier version and added some more—for example, the idea that imperfect information and search theory were important for unemployment,[49] and the notion that unemployment was increased by employers paying an 'efficiency wage' above the market-clearing wage to motivate and retain workers.[50] However, great care was taken to ensure that what were essentially ad hoc additions to the core real business cycle model appeared consistent with rational microeconomic foundations. To do otherwise was considered unacceptable. Eventually, this led to the modern dynamic stochastic general equilibrium models which so misled policy-makers in the 2000s and which, in a slightly revised form, continue to do so today.

As the authors of a seminal paper put it—'To provide theoretical underpinnings, the literature has incorporated the techniques of dynamic general equilibrium theory pioneered in real business cycle analysis. A key point of departure from real business cycle theory is the explicit incorporation of frictions such as nominal price rigidities that are needed to make the framework suitable for evaluation of monetary policy'.[51]

Finally, albeit reluctantly, New Keynesians accepted: (1) that in practice central banks set policy interest rates and do not control the money supply—in a sense, a rediscovery of something Wicksell had known long before—and (2) the need to adopt the Taylor rule to tie the hands of central bankers as far as interest rates were concerned. This was the final step to dynamic stochastic general equilibrium (DSGE) modelling.

Before outlining the essential parts of a New Keynesian DSGE model, it is important to stress the similarities of the model to the previous iterations of Neo-Keynesian, and even pre-Keynesian, models of the economy that went before. DSGE models include Neo-Keynesian frictions, but also draw on the natural rate hypothesis and preference for monetary over fiscal policy of Milton Friedman, and the mathematical microfoundations of real business cycle theory. Orthodox neoclassical macroeconomics has consistently involved the inappropriate use of some form of model of real analysis, with a barter core, to draw conclusions about a real world in which its fundamental axioms do not apply.

To deal fully with logical aggregation problems,[18] such a model should ideally have a single 'representative agent'. In order to do anything very interesting with these models, it is necessary to allow the actors within them to differ in some respect from each other. However, this needs to be kept to a minimum. With non-identical people in the models, social cost-benefit analysis lacks logical foundations.[52] Conversely, with fully identical people, the matter is trivial and the model is more coherent but nonsensical as a representation of the real world.

For the purposes of analytical convenience, the representative agent generally 'lives' forever, although the concept of over-lapping generations can be used to allow people in the model to die, and the agent maximises 'lifetime' expected utility. In each period, utility is a positive function of real consumption, where units are defined in terms of a composite commodity and a negative function of hours worked. In versions of the model where money actually exists, real money balances can be incorporated into the utility function, on the grounds that money conveniently eliminates 'transactions frictions' or money can itself be regarded as a 'friction'.

Many versions of the model adopt Woodford's 'cashless limit',[53] and omit money entirely, except as a unit of account. This means they have nothing to act as a nominally safe medium of exchange and perfectly liquid store of value. This is both ridiculous, from the point of view of building a realistic model of the economy, and at the same time perfectly logical, since as we have said there is no need for money in a general equilibrium model. From a Walrasian perspective, even a generally accepted unit of account is superfluous. None of this bears any resemblance to the world in which we live. However, it is the approach to devising and assessing economic policy prevalent in virtually all governments and central banks. The economists have forgotten that their model is absurd, and non-economists are too intimidated by the maths to appreciate that their economists are more or less practising alchemy.

Please do not be intimidated by what follows, as I am going to write down a few equations drawn from such a model. If you wish, you can leave the rest of the chapter out and just take it from me that the model being described is nonsensical, or you could just skim through it. If you have any background in mathematics, but not in orthodox economics, you will find it straightforward and may find yourself amazed that many economists think what follows to be a worthwhile way to model the economy. Not just a worthwhile way, in fact, but perhaps the only legitimate way of doing so.

The model often starts with a representative agent (let us call her a household) maximising her expected lifetime utility, subject to some constraints. This involves looking into the remote future, forecasting what wages, prices, taxes and interest rates will be, among much else, and then balancing off the utility from consumption and disutility for work in each period, and taking into account that the household is impatient, and so discounts future consumption, relative to current consumption, when making decisions.

$$\text{Max}\,.\,E_0\left\{\sum_{t=0}^{\infty}\beta^t U(c_t, l_t)\right\} \tag{2.1}$$

Subject to the budget constraint,

$$P_t C_t + Q_t B_t \;\leq\; B_{t-1} + W_t l_t - T_t \tag{2.2}$$

where β^t is the representative agent's discount factor for t-periods; P_t is the expected period t composite price level; c_t is expected real consumption; B_t is the expected number purchased of one period nominally risk-free discount bonds paying one unit of money at maturity and available for purchase at a price of Q_t; B_0 is therefore the value of an initial endowment at time 0; W_t is the anticipated nominal wage; l_t is the planned hours of labour supplied; and T_t is the expected value of a lump sum tax.

It is, of course, difficult to see how a bond can be redeemed for a unit of money in a model with no monetary asset. Indeed, it can only be swapped for goods.

A 'transversality condition', or solvency constraint, is then added,[54]

$$\lim_{T\to\infty} E_t(B_T) = 0. \tag{2.3}$$

This virtually rules out bankruptcy within the model, making an endogenously generated financial crisis impossible and any form of financial crisis very difficult to imagine. Given that the only possible source of nominally risk-free bonds must be a government, the transversality condition also implies a government solvency condition, so that government debt tends towards zero as time tends towards infinity.

This implies that the current value of government debt must at all times equal the present value of expected future budget surpluses. Where this would be true for all values of the price level, fiscal policy is said to

be Ricardian. Where it would not be true for all values of the price level, fiscal policy is non-Ricardian, and then, the transversality/solvency condition is met by variations in the price level. This is the *Fiscal Theory of the Price Level*.[55]

There is no capital asset in this simplified version of the model, and so there is no capital accumulation. Where such an asset is introduced, it often involves direct ownership by the representative household, with the asset then rented out to firms. It should be clear that there is no role for realistic financial markets in such a model. More generally, no model of real analysis can ever be adapted to provide a meaningful explanation of financial instability and financial crisis. Attempts to do so are misguided. You cannot fit Minsky and Keynes into general equilibrium reasoning, though you may tie themselves in logical knots trying to do so. Realistic monetary institutions and general equilibrium cannot be mixed.

The most you can do, if you transform household holdings of real assets into financial securities, is introduce modern equilibrium finance theory. This means the efficient markets theory, portfolio theory (where capital assets are allowed to be differentiated) and standard asset pricing models. Bubbles and crashes require further ad hoc additions to a model based on general equilibrium fundamentals and essentially make no sense. This is a world of fundamentals, of continuities and of small exogenous shocks.

One can divide households into those who are potentially liquidity-constrained and impatient ('borrowers'), and those who are less impatient ('lenders'), and then imagine a loanable funds system of financial intermediation, whereby the lenders take a risk and provide finance directly to the borrowers. Finally, to generate a 'financial crisis', one can add an exogenous increase in risk aversion.[56] However, it is misleading to imagine that such an approach has anything of value to contribute to the analysis of real-world financial crises. All you are doing is playing a logical game within a 'soft' economics model of real analysis. There is no scope for a financial crisis that can have a permanent impact on the evolution of output and employment.

As Paul De Grauwe, who is a critic of such models, has said, 'it is now standard practice of DSGE-modellers to simulate the consequences of the financial crisis on the economy by introducing an exogenous increase in risk aversion (and thus the risk premium)'.[57]

Some recent 'second-generation' post-GFC models now include banks, which can add to aggregate demand through the creation of credit. This is a welcome and long overdue concession to reality, as was the introduction of a policy interest rate in first-generation DSGE models. However, it does not make a model with a Walrasian core, which because of that core is still essentially a barter model, suitable for analysing a monetary economy, or as a basis for policy advice relating to monetary and fiscal policies. You cannot add realistic monetary institutions to a model, without incorporating uncertainty, and you cannot incorporate fundamental uncertainty into Walrasian general equilibrium models. The model still has far-sighted, well-informed, superhuman households at its centre. Businesses and these newly credit-creating banks are still constrained optimisers. Full employment, or a natural level of output, and natural rate of unemployment, are still guaranteed in the long run. It remains the case that only frictions such as sticky prices prevent the economy remaining continuously in such an equilibrium. There is still no possibility of endogenously generated booms and financial fragilities. There can be no genuinely Keynesian animal spirits and no fundamental uncertainty. The money that exists does not have the characteristics of money in the real world, which will be described in Chapter 3. These dynamic stochastic general equilibrium models are real analysis masquerading as monetary analysis. They are also a colossal waste of time and intellectual effort.

Financial instruments, including money, financial markets and financial institutions, are unnecessary additions to general equilibrium models, and when they are added to such models, it can only be as frictions, rather than as core elements in a description of a monetary economy. You can omit them from the models, without affecting the long-run equilibrium of those models. This remains the case in more sophisticated, second-generation versions of DSGE models. It is a consequence of the long-run full-employment assumption, even given the existence of credit-creating banks. Say's Law continues to rule the roost.

The representative agent in these models consistently makes optimising decisions over time, continuing to base intertemporal labour supply, consumption, savings and investment decisions on: (1) her own preferences for consumption against leisure; (2) her personal marginal rate of time preference; and (3) the best possible, model consistent, rational

expectations forecasts of wages, rents, prices, taxes and yields, stretching into the infinite future. It leads to something equivalent to the following Euler equation,[58]

$$\frac{\mathrm{mu}_c(c_t)}{E_t\left[\mathrm{mu}_c(c_{t+1})\right]} = \frac{\beta\,.\,(1+r_t)}{(1+E_t\pi_{t+1})}, \tag{2.4}$$

where mu_c is the marginal utility of an additional unit of real consumption; r_t is the period t nominal interest rate on the safe bonds; β is the household's real discount factor (a measure of how impatient the household is to enjoy utility sooner, rather than later, with a maximum value of 1, and lower values signifying a greater degree of impatience); and $E_t\pi_{t+1}$ is the expected inflation rate. Where the representative household has a marginal rate of time preference, $\frac{(1-\beta)}{\beta}$, equal to the real rate of interest, $\frac{(r-E_t\pi_{t+1})}{(1+E_t\pi_{t+1})}$, this reduces to the equalisation of the expected marginal utility of real consumption in every period, which, given constant preferences and interest rates, implies a random walk model of consumption.[60] A random walk means changes in consumer spending ought to be unpredictable, just reacting to random and unpredictable 'shocks' in the economy. The best prediction for consumption for the representative household in every period in the future, given the currently available information, is the current level of consumption. Of course, this is nonsense. The mathematics rapidly becomes intimidating enough to stop students pointing out the long list of nonsensical results from such models, as by now you can imagine, and those developing the maths and trying to employ DSGE models long ago lost touch with reality, which is the only reason they are taken seriously.

With output defined as the sum of consumer spending and pure government spending, if we are to continue to exclude capital accumulation, it also implies the following form of forward-looking aggregate demand (or IS) equation,

$$y_t - yn_t = c_1E_t(y_{t+1} - yn_{t+1}) + c_2(r_t - E_t\pi_{t+1}) + \varepsilon_t, \tag{2.5}$$

where y_t and yn_t are the logarithms of current period real output and the natural level of output, respectively, such that $(y_t - yn_t)$ measures the 'output gap'; π_t is the current period inflation rate; ε_t is a random and non-serially correlated shock; and c_1 and c_2 are parameters which need

to be calibrated to make the equation 'fit' past data on the economy as nearly as possible.

The forward-looking representative household bases her current consumption decision on the expected next period output gap and the current real rate of interest. This household is imagined to engage in optimal intertemporal transactions in real physical goods (since bond purchases in a non-monetary model involve exactly this transaction) in order to practise the dynamic optimisation of expected utility across an infinite time horizon.

In the absence of exogenous shocks, this is functionally identical to the auction at the beginning of logical time in an old-fashioned Walrasian equilibrium. The whole of history is organised at time 0. Given complete markets, so that every future contingency can be allowed for at time 0, it is exactly the same. The decisions need only be made once, and then, history can be allowed to occur with no further decisions required.[60]

It is often implicitly taken for granted that the household does not value public good provision by the government and is not affected by the welfare of others, and, of course, it is always assumed that labour supply has a marginal disutility ('leisure' always has a strictly positive marginal utility).

These optimising households are, in theory, selling their labour, and renting their capital, to profit maximising firms, where the firms are price takers in the labour and capital markets, using often homogenous labour and a homogenous capital good to produce output. There is a simple mathematical relationship between the amounts of labour and capital employed in production and the quantity of real output produced, called a production function.[61] Firms do not have a genuinely separate existence from the households who supply them with their resources. There is no divorce of ownership from control in the standard model.

In order to introduce the friction of sticky prices to the model, it is necessary to break with previous versions of general equilibrium models at this stage, by assuming that the product market is characterised by product differentiation and therefore monopolistic competition. This is done purely for analytical convenience, as oligopoly will not fit into the model, and perfect competition does not allow for any variation in pricing decisions between firms.

The standard so-called Keynesian element which is then introduced into the model is a pricing friction, known as the *Calvo pricing rule*.[62] Under this rule, a fraction α of firms are not permitted to change their prices in any given period, with the other fraction $(1-\alpha)$ free to change price. A higher value for α implies a more sticky overall price level. A zero value means perfect price flexibility and a return to real business cycles.

The firms which are permitted to change price are determined in the model by a lottery. Some authors have tried to develop an optimising basis for rules of this kind, based on 'menu costs', but it is very difficult to do so convincingly, particularly when authors start to mention the use of lotteries. There is no insight provided in these models towards the role fixed forward prices might play in reality in stabilising cash flows. They therefore induce blindness to the role played by forward contracts in an uncertain environment.

Profit maximisation by forward-looking firms which can only periodically change their prices, given a Calvo restriction, implies an aggregate supply equation as follows:

$$\pi_t = \beta E_t \pi_{t+1} + \kappa(y_t - yn_t) + \eta_t. \tag{2.6}$$

This equation is also known as the New Keynesian Phillips Curve, where β is the discount factor applied to expected future profits; κ is a coefficient that depends on the Calvo parameter α and on the gradient of the marginal cost curve; and finally, η_t is a random and non-serially correlated shock.

Given a value for α of 0, and consequently no pricing 'friction', the model reduces to the special case of real business cycles, with κ tending towards ∞ and a zero output gap.

To complete the basic DSGE model, an optimising central bank is introduced, minimising a loss function of the following form:

$$L = (\pi_t - \pi^{\mathrm{T}})^2 + \psi(y_t - yn)^2, \tag{2.7}$$

where π^{T} is the central bank inflation target, and ψ measures the relative emphasis the central bank puts on output stabilisation, compared to hitting the inflation target.

In order for this loss function to be consistent with the microeconomic foundations of the model, a case has to be made for the

representative household to be adversely affected by variations in the rate of inflation from some optimal target and variations in real output from its natural level. The existence of a natural level of output is taken for granted. In addition, some case has to be made for a non-zero inflation target, perhaps based on bias in the official estimates of inflation or on asymmetric pricing frictions. Alternatively, this central bank loss function can just be assumed as a positive theory of the objectives of modern central banks, rather than as a normative theory of how they ought to behave. There is little doubt that when Ben Bernanke made his 'great moderation' reference, with its emphasis on the volatility of inflation and output gaps, rather than on the levels of unemployment, growth and inflation, he was influenced by this loss function.

The task for the optimising central banker is then a mechanical one of dynamically adjusting the nominal rate of interest, over which the central banker has control, to influence the current output gap, in order to influence the inflation rate. The existence of forward-looking households and firms places an emphasis on policy credibility. The output gap in the current period depends on what it is rationally expected to be in the next period: current inflation depends on a rational expectation of its future value.

This problem produces an interest rate setting rule of

$$r_t = (in_t + \pi^{\mathrm{T}}) + w_\pi(E_t\pi_{t+1} - \pi^{\mathrm{T}}) + w_y(y_t - yn_t), \qquad (2.8)$$

where in_t represents the current value of the natural, real rate of interest, which is determined by the marginal rate of time preference and the marginal productivity of capital, given the natural rate of output; π^{T} is the target for inflation; w_π reflects the weight given to deviations in the forecast rate of inflation from its target; and w_y is the weight given to the output gap, in setting the policy interest rate.

For plausible values of model parameters, and assuming a target rate of inflation of 2% and a natural real rate of interest of 2%, this interest rate setting equation can be re-written as

$$r_t = 0.04 + 1.5\left(E_t\pi_{t+1} - \pi^{\mathrm{T}}\right) + 0.5(y_t - yn_t). \qquad (2.9)$$

If we assume a time period is a quarter (3 months), and also that a central bank reacts to the inflation rate over the previous four quarters (rather than a rational expectation of future inflation), we get the Taylor rule.[63]

$$r_t = 0.04 + 1.5(\pi_t - \pi^T) + 0.5(y_t - yn_t). \tag{2.10}$$

In this equation, $w_\pi > 1$ is the *Taylor principle*,[64] which states that nominal interest rates must be increased by more than any increase in the (expected) rate of inflation in order for the policy rule to be consistent with stability, although strictly the condition for stability is more complicated than this. Given the assumed dependence in the model of aggregate demand on real interest rates,[65] and an implied need to produce a negative output gap to put downward pressure on inflation, the Taylor principle is an obvious feature of the model.

In My End Is My Beginning

It has been a very long journey, but the Taylor rule and the Wicksell rule are not all that different. Both have their roots in general equilibrium real analysis and just as Keynes proposed a monetary replacement for Walras and Wicksell, by dropping Say's Law and rejecting the notion of a natural rate of interest, so today we require a monetary replacement for DSGE models.

It has been possible to make DSGE models and Taylor rules fit real-world data a little better, by making a further series of more or less ad hoc adjustments. To take account of the fact that central banks normally adopt a gradual approach to changes in interest rates, it is necessary to introduce r_{t-1} onto the right-hand side of the interest rate setting (Taylor) rule.

A more serious problem is the lack of any credible business cycle theory in this New Keynesian model, as it stands. Business cycles which do not rely on the implausible assumptions of those real business cycle models we have already dismissed imply serially correlated and non-normally distributed output gaps, which are not featured in the above model. One New Keynesian response has been to make households 'habit forming', so that there is inertia in the aggregate demand equation, and firms unable to actively adjust prices this period able to at least index to inflation, so as to introduce a backward element into aggregate supply. The first of these represents a reluctant movement from Friedman's permanent income view of consumption decisions,[66] towards James Duesenberry's relative income theory,[67] and is questionable in a rational expectations model. The second has no logical basis in the model at all.

A further response is to make the exogenous shocks to aggregate demand and supply in the model subject to serial correlation themselves. This again is surely questionable, as serially correlated 'shocks' cannot fairly be regarded as shocks at all.

Backward-looking pricing and consumption and serially correlated shocks are able to produce serially correlated movements in output within the model, as in real-world business cycles. However, Paul De Grauwe, in his *Lectures on Behavioural Macroeconomics* (2012), demonstrates that simulations based on an amended New Keynesian model still give rise to variations in output which are not consistent with the data. The DSGE approach does not predict or explain the number of relatively large movements in output gaps which arise in real-world economies. This is, of course, not surprising in a general equilibrium system, consisting of optimising decision-makers with rational expectations, who are not subject to herding behaviour, or other biases, or cognitive limitations, or fundamental uncertainty.

De Grauwe rightly criticises the evolution of DSGE models as unscientific. They exhibit the characteristics of a degenerative research programme, in the sense of Imre Lakatos.[68] A series of non-core amendments and ad hoc additions to the inviolable core axioms of the model have been made to minimise the gap between historical evidence and the qualities of the model, but without allowing the model to predict or explain vital features of real-world economies—most notably, financial crises.

De Grauwe rejects rational expectations as a basis for forecasting inflation and output gaps, on the basis that it is implausible. He compares the notion that a representative household could understand and act on a full knowledge of the structure of the economy to old models of central planning. They both involve a 'top-down' view of the economy, with the only difference being that the all-knowing central planner has now been replaced by the even more implausible representative agent with rational expectations.

His suggested amendment to the model is to allow for households to use one of a variety of 'heuristics' or rough and ready decision rules, to forecast both inflation and output gaps, where those rules are subject to adjustment over time, based on their performance. This more plausible approach to expectations formation and decision-making at least introduces non-normality into output gaps and inflation—in other words, it produces a model which can be made to fit real world data rather better

than a DSGE model. However, it still fails to explain the fact that economic downturns tend to be more sudden and severe, though shorter-lived, than economic recoveries. De Grauwe's analysis is a considerable intellectual achievement and makes a fundamentally New Keynesian model far more consistent with the data. But it still misses the point.

The point is that all general equilibrium models can be traced back to the fable of a barter economy. They all omit fundamental uncertainty and as a consequence can do no other but omit genuinely realistic monetary and financial institutions. They are incapable of describing, even in a stylised way, the realities of a monetary, Wall Street economy. They do not naturally incorporate historical time; path dependence; persistent involuntary unemployment; financial instability; or modern fiat money. To even begin to deal with reality in a useful manner, we need to substitute some form of monetary analysis for the real analysis which has always been at the centre of neoclassical economics.

This alternative vision of an economy, as a complex and fundamentally unstable and uncertain system, without any stable equilibrium point but constrained by conventions and institutions, and by the laws of accounting and evolving balance sheets, is much better suited as a guide for understanding the behaviour of capitalist economies and for guiding policy-makers.

In monetary analysis, money is neither neutral nor exogenous. There is no natural, equilibrium level of output to which the economy would revert over time, given perfectly flexible prices. There is no technologically determined distribution of incomes. Production takes time; the financing of production and exchange matters; and the financial system itself is best thought of as a set of interconnecting and shifting balance sheets, with a tendency towards growing imbalances and financial fragility. The economy is a complex, disequilibrium system, which requires instability thwarting mechanisms if it is to be held close to full employment with a moderate rate of inflation. The distribution of income and wealth reflects bargaining power, institutional structures and social conventions. The rational individualist of neoclassical economics does not exist. How real people make real decisions in an uncertain world matters.

In his *New York Times* blog of 18 June 2013, Paul Krugman quoted Mark Thoma as saying, 'new economic thinking means reading of old books'. My next task is to consider the extent to which 'old books' written by Keynes, the American Post-Keynesians Davidson and Minsky, and Kalecki, can help to lay foundations for a new 'hard' economics, based on a 'monetary theory of production' and the study of 'man as he is (and woman as she is) and the economic system as it actually exists'.

Or to use the words of Keynes himself, 'I believe that the next task is to work out in some detail such a monetary theory of production. That is the task on which I am now occupying myself in some confidence that I am not wasting my time'.[69]

Notes

1. David Ricardo, author of *Principles of Political Economy and Taxation* (1817); developer of the Theory of Comparative Advantage, which was central to neoclassical trade theory; the labour theory of value, which was equally important to Marxists; and, it is argued, a pioneer in the use of economic models based on unrealistic assumptions (soft economics).
2. Jean-Baptiste Say, author of *Traité d'économie politique* (1803); developer of Say's Law, which is the notion that there can never be an overall excess supply of goods, and therefore, the economy must always be at full employment. This remains a long-run feature of modern-day, state-of-the-art, orthodox macroeconomics. Say's Law is often written as 'supply creates its own demand'.
3. The 'almost' is a reference to Sraffian, or Neo-Ricardian, economics. Sraffa offered a non-neoclassical approach to real analysis, which identified logical failures within the neoclassical model and, in spite of its non-monetary form, can be seen as supportive of the Post-Keynesian monetary analysis to be discussed in Chapter 3.
4. Leon Walras, author of *Éléments d'économie politique pure* (1874), replaced the famous 'invisible hand' of classical economics with a mythical neoclassical auctioneer. This auctioneer coordinates the demand for and the supply of every commodity in a market system, via a trial and error process called 'tatonnement', finding a vector of relative prices at which all markets within a barter system would clear. Walrasian general equilibrium theory, incorporating Say's Law, is fundamental to all soft orthodox macroeconomic theory, including real business cycle theory and the New Keynesian neoclassical synthesis.
5. See Chapter 5.
6. The great majority of those published in the nearly 150 years since *Money and the Mechanism of Exchange* (1875), by W. S. Jevons, so no specific modern reference is given.
7. Humphrey (1985), quoted in Graeber (2011, 29).
8. Davies (1994, 23).
9. Karimzadi (2013).
10. Goodhart (1998).
11. As explained by Minsky, in a paper entitled 'The Financial Instability Hypothesis' (1992).

12. The term 'neoclassical synthesis' refers to the use of (soft) real analysis to justify broadly Keynesian economic policies. The economics of Keynes is (hard) monetary analysis. The addition of 'frictions' to a general equilibrium model allows for shocks to drive the economy away from its full-employment equilibrium for an extended period, providing a justification for the use of fiscal and/or monetary policy to manage demand in order to push the economy back towards its equilibrium. During the first neoclassical synthesis, fiscal policy was the preferred tool of stabilisation policy: during the second neoclassical synthesis, monetary policy played this role.
13. Bernanke (2004).
14. The original Phillips Curve was based on a statistical study of the negative correlation between unemployment and the rate of change of money wages (wage inflation) in the UK during the period 1861–1957 (Phillips 1958). The relationship appeared to be stable over long periods of time. Samuelson and Solow (1960) identified a modified relationship for the USA and advocated for what they called the Phillips Curve to be used as a guide for policy-makers.
15. Gini statistics are based on Lorenz Curves. A Lorenz Curve is drawn with the cumulative proportion of households on one axis and their cumulative share of income on the other. The further a Lorenz Curve lies away from a diagonal line bisecting the intersection of the two axes, called the line of equal distribution; the higher the value of the Gini statistic, the greater the implied degree of inequality. Income inequality has been rising in the USA for nearly 50 years. In other words, the Lorenz Curve has shifted away from the diagonal, and the US Gini statistic has increased.
16. Tcherneva (2015).
17. Keynes (1936, 132).
18. The issue of identifying what a unit of capital is supposed to be in a macromodel is the cause of a series of issues call the *Cambridge Capital Controversies*. These controversies undermine the neoclassical theory of income distribution.

    The impact on people's real incomes of changes in prices leads to a further problem, in the form of a mathematical result called the *Sonnenschein–Mantel–Debreu theorem*. This implies that a unique equilibrium might not exist.

    Since we are going to reject general equilibrium theory on the basis that it is real, rather than monetary analysis, and as such is based on implausible axioms, failures of its internal logic are not my concern in this book. Readers with an interest in these issues might refer to Lavoie (1992) or Keen (2001).
19. Hahn (1983, 1).
20. The Quantity Theory of Money is a very old theory. In the twentieth century, it was particularly associated with Irving Fisher and Milton

Friedman. Briefly, it is the theory that the quantity of money in circulation determined the price level, and that increases in the supply of money are the cause of inflation.

21. Rogers (1989).
22. Fisher (1930).
23. Loanable funds theory is implied by general equilibrium models. It is the theory that the demand for loanable funds for investment and other purposes is constrained by the supply of loanable funds out of household saving. If the economy is in equilibrium, at full employment, then savings can only be increased at the expense of consumption, and the willingness of households to save rather than consume limits the supply of resources for investment spending. The facts that real-world economics are not generally at full employment; that money is endogenous; and that funds are in real life borrowed into existence before being saved, imply that loanable funds theory is a fallacy. It is, however, a fallacy which remains embedded in modern dynamic stochastic general equilibrium models and indeed in all real analysis.
24. The Taylor rule is a policy rule for central bankers, where official interest rates are set according to a formula based partly on deviations in current or expected inflation from a target and partly on the size of the gap between current or expected output and the potential output of the economy.
25. Keynes (1939), Dunlop (1938), and Tarshis (1939).
26. The IS-LM model is normally represented using a graph with interest rates on the vertical axis and real output on the horizontal. A downward sloping IS curve describes how the demand for output depends negatively on the rate of interest. Fiscal policy shifts the IS curve. An upward sloping LM curve shows that for a constant money supply, an increase in output increases the demand for money and so increases the rate of interest. Changes in the money supply shift the LM curve. The intersection point of the two curves is Hicks's general equilibrium.
27. Minsky (1975, 57).
28. Keynes (1937).
29. Hicks (1976, 290).
30. *Contributions to Modern Economics*, Robinson (1978, 256).
31. In Chapter 3 of *A Tract on Monetary Reform*, Keynes (1923).
32. As quoted in Davidson (2009, 181), parenthesis as in Davidson.
33. Arrow and Debreu (1954).
34. Solow (1956). The Solow-Swan neoclassical growth model was also developed independently by the Australian economist Trevor Swan in the same year.
35. Solow, interviewed in Klamer (1984, 31).
36. Minsky (1982, 91).

37. In *Inflation: Causes and Consequences*, Friedman (1963).
38. Tobin (1972).
39. Friedman (1972).
40. Barro (1974).
41. Friedman (1968, 9).
42. In Friedman (1968) and Phelps (1967).
43. OECD (1994).
44. Cingano (2014).
45. https://fred.stlouisfed.org/series/NROU.
46. Lucas (1972, 1976).
47. Davidson (1982).
48. Kydland and Prescott (1982).
49. Fischer (1977).
50. Diamond (1982) and Farmer (2010).
51. Shapiro and Stiglitz (1984).
52. Clarida et al. (1999).
53. There is no logical basis for comparing the impact of any decision regarding the use of scarce resources on the well-being of two different individuals. In practice, cost-benefit analysis is usually based on monetary willingness to pay, but a marginal dollar of income or expenditure cannot be interpreted to have an identical impact on the well-being of non-identical individuals, and this problem cannot be resolved by weighting money amounts. No objective basis exists for interpersonal comparisons of well-being.
54. Woodford (1998) wrongly equates technological change allowing for elimination of a need to hold money balances for transactions purposes with the elimination of monetary assets entirely. He fails to recognise the importance of money as a nominally safe and perfectly liquid store of value. This is discussed in chapters three and five.
55. The definition, by R. A. Becker, in the 2008 edition of *The New Palgrave Dictionary of Economics* includes the following statement—'The transversality condition requires the present value of the state variables to converge to zero as the planning horizon recedes towards infinity'. Any clearer? I thought not. As I said, it assumes away things like growing financial fragility and endogenous financial crises—like the one that happened in 2008.
56. There are various versions of this absurd theory (including Woodford 1995). At least they allow for fiscal policy to have an impact on total spending, unlike the Barro-Ricardian equivalence theory. However, they retain the long-run money neutrality (or full employment, or Say's Law) characteristic of all general equilibrium analysis. Consequently, while an increase in government debt can raise total spending, this simply increases the equilibrium price level. It is the fiscal version of the old quantity theory.
57. Eggertsson and Krugman (2011).

58. De Grauwe (2012).
59. The Euler equation, in economics, is a consequence of the use of calculus to derive a condition for our representative household to maximise her utility over time. It implies that the expected present value of the last $1 to be devoted to consumption in each future time period must be equalised. The decision-maker cannot decide to cut back spending in some periods to allow for additional spending in others and by doing so increase her expected utility. The maths is nice. The assumptions that it is possible to behave this way and that people actually do behave this way are, of course, completely unrealistic. This is soft economics, remember.
60. A random walk means that future consumption spending is impossible, under these circumstances, to predict. Its expected future value equals its current value. It could rise or fall, depending on what unexpected events happen to the economy, but you may as well toss a coin to predict which will happen.
61. This should seem a very strange property of the model indeed. It does not include time as we experience it. There is a sort of logical time in the model, but no realistic historical time, in which decision-makers are faced with a constant stream of decisions under uncertainty.
62. The aggregate production function is flawed, not only because it either excludes energy and natural resources entirely or assumes they can be substituted for by capital or labour, but also due to the problem of defining capital (see the *Cambridge Capital Controversies* in note 18 above).
63. Calvo (1983).
64. Taylor (1993).
65. The Taylor principle is best explained using examples. Suppose the target for inflation is 2%, the 'natural' real rate of interest is also 2%, the weighting for the gap between inflation and its target is 1.5, and the output gap is zero. When inflation is at its target rate of 2%, the official interest rate will be 4%. An increase in inflation by 1 to 3% implies an increase in the policy rate by 1.5 to 5.5%. This ensures an increase in the real rate of interest, from the natural rate of 2 to 2.5% (5.5%–3%). It is the increase in the real rate of interest which then puts downward pressure on aggregate demand and consequently on the rate of inflation.
66. The aggregate demand relationship can be described as an IS curve, since aggregate demand depends inversely on the real rate of interest. There is no LM curve in this model, since the DSGE model has endogenous money and policy interest rates. In this sense, but only in this sense, this model is an improvement on the old IS-LM models.
67. The theory that consumption decisions are taken at every stage in life by households who can borrow and lend limitless sums at the same rate of interest to maximise expected lifetime utility. The Euler equation discussed in note 58 is an expression of this theory.

68. Duesenberry really has no place in this chapter. His harder, as in more realistic, relative income hypothesis allows households to be influenced in their spending decisions not only by their own past levels of income (so that habit forming influences current spending), but also by the incomes of those to whom they compare themselves.
69. Lakatos (1970).
70. Keynes (1933).

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CHAPTER 3

New Wisdom from Old Books

The economics of Keynes' *General Theory*, the contributions of three generations of post-war Post-Keynesian economists, and the recent body of work known as modern monetary theory, are not within the tradition of soft real analysis. They are all examples of hard monetary analysis. The economy is described in monetary analysis, not as a Walrasian general equilibrium system, but as a set of shifting and interlocking balance sheets, evolving over time, driven by decisions made by business people doing their best to survive and make a monetary profit in an often uncertain economic environment. Money is not a commodity, but instead part of a hierarchy of debt, with the financial liabilities of a currency issuing, tax collecting, central government sitting at the apex of that hierarchy.

This chapter provides a brief and partial description of the first serious attempt at monetary analysis, as outlined by Keynes in his *General Theory* (1936) and four subsequent academic papers (1937a, b, c; 1939). In these works, Keynes laid much of the foundations for what became known after his death as Post-Keynesian economics. It goes on to discuss some of the important contributions made by a Polish contemporary of Keynes, and two later American Post-Keynesians, which built on and clarified a genuinely Keynesian approach to macroeconomics.

The economists I have selected for this purpose are Paul Davidson, Hyman Minsky and Michal Kalecki. I have not tried to describe all their contributions to economics, which is impossible within a single chapter. I have selected Davidson, Minsky and Kalecki, in part, with reference

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to an important paper published in 1975 by Alfred Eichner and Jan Kregel, entitled *An Essay on Post-Keynesian Theory: A New Paradigm in Economics*.

Eichner and Kregel defined three distinguishing characteristics of what they called Post-Keynesian theory:

- It 'retains the fundamental approach to a monetized production economy outlined by Keynes', which is an economy which is driven by effective demand and has no natural tendency towards full employment.
- It is 'rooted in a dynamic process' in historical time, and that process is a potentially unstable and uncertain disequilibrium process.
- It is concerned with the distribution of income as 'integral to the explanation of economic activity', and that distribution is not determined by technological factors.

I have changed the order in which these characteristics were listed and have interpreted them to be consistent with the view that Paul Davidson's interpretation of uncertainty and liquidity preference theory, and Hyman Minsky's financial instability hypothesis provide the best succinct description of the first two of these characteristics; and Michal Kalecki's analysis of income distribution and the degree of monopoly the most enlightening treatment of the third.

Keynes and Three Other Post-Keynesians

Keynes, Davidson (1972, 2002, 2007), Minsky (1975, 1982, 1986), and Kalecki (1971) provide us with foundations for the monetary analysis of a real-world economy, evolving through historical time with realistic monetary and financial institutions; where employment is dependent on the effective demand for labour; finance and investment are inherently unstable; uncertainty is fundamental; and the distribution of income and wealth depends on bargaining power.

This is a very different description of how an economy works to that provided by the real analysis of neoclassical economics. Real analysis provides a description of an economy which could never exist: monetary analysis provides a description of how real economies actually function.

A superficial and incomplete reading of *The General Theory* can lead to a fundamental misunderstanding of Keynes' economic model, using the

term in this case to describe Keynes' mature views on the evolution of a monetary economy over time. This is clear on a careful reading of four subsequent papers of Keynes, three dating from 1937, with the fourth published in 1939.

The common misunderstanding of Keynes has been attributed to the following factors, of which, Keynes was well aware:

- The tendency of orthodox economists in every age to see the economy as a stable general equilibrium system met with random disturbances and kept temporarily away from its equilibrium state by 'frictions', such as the infamous 'sticky wages'.
- Keynes' intention of writing in a persuasive and coalition-building manner for his fellow academic economists, which led him more than once to downplay the differences between his 'general theory' and what he regarded as the 'special theory' of what he called 'classical economics'.[1]
- Keynes' long history of learning, teaching and practising 'classical economics'.
- Keynes' intention, as explained by Davidson, to retain the axiomatic-logical basis of orthodox economics, but to relax key axioms within the neoclassical orthodoxy to produce a more general theory. James Galbraith has suggested that the term 'General Theory' was deliberately borrowed by Keynes from Einstein.[2]
- The omission of the 'technical monetary detail' of his earlier *Treatise on Money*, which is left 'in the background' in *The General Theory*.
- The fact that Keynes did not reject the theory that real wages were determined by the marginal productivity of labour, even though he did reject the notion that unemployment could be eliminated via wage cuts.

Keynes later admitted that the marginal productivity theory of wages was unrealistic. Its lack of a firm logical basis was explained by his colleagues, Piero Sraffa and Joan Robinson,[3] the instigators of the long-running Cambridge Capital Controversies debates between neoclassical and heterodox economists, but it can be rejected purely on the basis that it is implausible. It contradicts more realistic descriptions of the determinants of the distribution of income, including that of Michal Kalecki, which will be discussed in this chapter.

Paul Davidson has argued that Keynes was merely demonstrating that Say's Law could be rejected by orthodox economists within their own model, without going any further than taking money and uncertainty seriously, and Keynes' own comments support this interpretation.[4]

The problem is that economists who don't engage fully with Keynes' complete model, and so lack an understanding of uncertainty and liquidity preference, emerge with the impression that involuntary unemployment might be the result of those 'frictions' of which pre-Keynesians[5] were already aware—most notably, the downward inflexibility of wage rates. They wrongly imagine that persistent unemployment must be a consequence of nominal, and perhaps real, wages being too high.

All this is the result of a misreading of *The General Theory*. In it, Keynes argues that money wages are inflexible downwards, but that even if this were not the case, real wages would be inflexible downwards in an environment of falling wages and prices. Keynes also clearly states that inflexible wages are not the cause of persistent unemployment. The cause, for him, is the natural operations of an uncertain entrepreneurial monetary economy, and its failure to provide consistently a full employment level of effective demand for labour.

Paul Davidson: Uncertainty and Liquidity Preference

A proper understanding of Keynes' theoretical revolution involves a thorough reading of not only *The General Theory*, but also of the four papers already cited, which we written after its publication. Paul Davidson has spent a long and sometimes controversial professional life, explaining this, and interpreting Keynes' work, attempting to update Keynes' ideas, and applying his generally persuasive interpretation of the Keynesian 'general theory' to modern economic problems.

Davidson has provided us with a valuable description of the 'classical' axioms that Keynes sought to overthrow in moving from the 'special' (real analysis) full employment theory of classical economics to a more 'general' (monetary analysis) theory of employment, interest and money. These axioms have been stated by Davidson many times in numerous papers and texts.

The three soft 'classical axioms', maintained in all orthodox economics, at least in the long run, are 'the neutral money axiom', 'the gross substitution axiom' and 'the ergodic axiom'.

The *neutral money axiom* is just another name for the assumption of full employment, or Say's Law. If economies always revert to a full employment equilibrium given by technology and preferences, and given independently of demand and of money and finance, then, at least in the long run, money will be neutral. This is the world of orthodox real analysis. It is the world of a 'natural rate of unemployment', where that rate is interpreted as the full employment equilibrium of the economy.

The *gross substitution axiom* states that all commodities, where money and labour are (misleadingly) regarded as commodities, are substitutes for each other, so that changes in relative prices can allow the economy to react to shocks, such as an increase in the demand for commodity money, to restore the economy to full employment and to ensure Say's Law and money neutrality apply. Once again, this is real analysis. It no longer applies given a properly developed monetary analysis of the economy.

The *ergodic axiom* relates to Davidson's interpretation of Keynes's views on the central and subtle issue of expectations, risk and uncertainty. The *ergodic axiom* as applied in economics states that the probability distributions of future relevant economic variables can be known, based on currently available and historical information. As Davidson puts it, it implies that data drawn from the past and present can be described as a random sample drawn from all possible futures. Decision-makers could, in principle, if this was true, possess actuarial certainty when making forecasts of future economic variables of interest. All risks would be calculable and insurable. There would be no significant fundamental uncertainty.

Without the ergodic axiom,[6] the future must be genuinely uncertain, and there will be a precautionary demand for money as a perfectly liquid and nominally safe financial asset and form of insurance against this uncertainty. There may, as a result, be no change in relative prices which can cause those holding money to exchange it for goods and services. Consequently, Say's Law will not apply, and there is the potential, in the absence of an appropriate fiscal policy, for persistent unemployment due to a lack of effective demand.

The ergodic axiom, the gross substitution axiom and the neutral money axiom do not hold in a capitalist monetary economy. Full employment is not assured, and an approximation to full employment is at best a special and temporary case. There is no market process whereby a general equilibrium can be achieved. Orthodox economics (real analysis) is the *special theory*, with more restrictive axioms: it is the economics of Keynes (monetary analysis) which is the more *general theory*, where these axioms are abandoned.

Keynes has many times been described as the first economist to take the role of expectations in decision-making seriously. In Chapter 5 of *The General Theory*, he distinguished between the short-run expectations of business, that determine current levels of output and employment, which are relatively stable over time, and heavily influenced by recent realised sales; and the long-run expectations of business and portfolio investors, that determine capital investment decisions and speculative asset valuations, and which are subject to a much higher degree of uncertainty and 'liable to sudden revision'.

Nevertheless, the economist who is usually given credit for first clarifying the distinction between quantifiable risk and unquantifiable uncertainty is Frank Knight.[7] Davidson makes a distinction between Knightian or epistemological uncertainty, and Keynesian or ontological uncertainty.

Epistemological (Knightian) uncertainty is uncertainty born of limited information-processing power or an increasing marginal cost of information. Where the outcomes of a decision cannot be described as having computable or estimable probabilities, this does not mean that such probabilities do not exist. Objective probabilities may exist, but they may be beyond the capacity of any individual to know. Uncertainty is due to a limitation on what can be known and not due to the non-existence of probability distributions relating to the outcomes of future events.

Ontological (Keynesian) uncertainty, according to Davidson, can be regarded as being of a more fundamental kind and associated with Keynes' discussion of long-run expectations—both in Chapter 12 of *The General Theory* and in his 1937 paper in the *Quarterly Journal of Economics*—though it can also be found, in his much earlier and philosophical *Treatise on Probability*.

When assessing the returns on a long-lived capital investment project, there may be no basis for the formation of reasonable probability distributions of projected cash flows and rates of return. If we want to 'behave in a manner which saves our faces as rational, economic men' to use Keynes' words, our only option is to use some kind of heuristic, such as assuming 'that the present is a much more serviceable guide to the future' than is likely to be the case; that 'the existing state of opinion as expressed in prices and the character of existing output is based on a correct summing up of future prospects', which means behaving as though markets are informationally efficient, when there can be no basis for this assumption; or that we can 'fall back on the judgment of the rest of the world which is perhaps better informed' and behave according to the conventions of the moment.

Keynes goes on to say that 'a practical theory of the future based on these three principles has certain marked characteristics. In particular, being based on so flimsy a foundation, it is subject to sudden and violent changes. The practice of calmness and immobility, of certainty and security, suddenly breaks down. New fears and hopes will, without warning, take charge of human conduct. The forces of disillusion may suddenly impose a new conventional basis of valuation. All these pretty, polite techniques, made for a well-panelled Board Room and a nicely regulated market, are liable to collapse'.

This is one of the most important passages in the history of economic thought, and yet it is ignored by orthodox neoclassical-synthesis Keynesians. Keynes identifies a critical weakness in orthodox thought—its treatment of uncertainty and long-run expectations. He defines uncertainty in this case in an ontological sense—as concerned with matters where 'there is no scientific basis on which to form any calculable probability whatsoever. We simply do not know'.

Keynes also outlines a conventional approach to expectations formation, which allows us to 'save our faces as rational, economic' decision-makers. He deals with both uncertainty and rationality in the same passage. When the future is uncertain, rationality cannot be based on a quantitative assessment of objective expected values and risks: a form of rationality, based on conventions which provide only a 'flimsy foundation' for our expectations and are subject to 'sudden and violent changes', is all we have available to us.

Paul Davidson would say the economy is a non-ergodic system. An ergodic system is one governed by probability distributions which in principle are available to be discovered. Even if the cost or complexity of gathering the necessary information to estimate these probabilities is prohibitive, or beyond our cognitive capacities, so that the situation is uncertain in an epistemological sense (in terms of what can be known), the environment could be described as ergodic if that information existed.

In a non-ergodic system, the probabilities of future outcomes are unknowable because they do not and cannot exist. They remain to be created. George (G.L.S.) Shackle[8] described a decision as 'a cut between past and future, an introduction of an essentially new strand into the emerging pattern of history'. As Shackle put it, 'the future, which will be partly created by this choice and a million similar contemporary ones made by other decision makers, does not yet exist'.

Non-ergodic systems are governed by processes which are uncertain, not due to human cognitive limitations and/or research costs, but in a more fundamental way—because of the current crucial, inter-connected and irreversible decisions of many individuals, who do not make decisions in a stable environment, but instead collectively create that environment by their decisions and actions. The billionaire George Soros has called this 'reflexity'.

Davidson has often compared the non-ergodic environment of Keynes to the approach taken to what can be known by Robert Lucas and all those building models based on rational expectations. For Davidson, rational expectations models assume objective probabilities, which can be learned based on the relative frequencies with which states of nature occur in a stationary environment. In rational expectations models, agents behave as though they are aware of how the economy functions, and they never make even theoretically predictable errors. All the available information which has relevance to forecasts of future values of economic variables is taken into account when decision-makers form their expectations of those future values. It is assumed that they do not use heuristics or conventions—they optimise. This is built into orthodox dynamic stochastic general equilibrium models.

Davidson, Shackle, Soros and Keynes argue that there is insufficient 'available information' to allow for anyone to optimise in this way, where decisions with long-term consequences are concerned, and in highly volatile environments, such as a financial crisis, even for short-term decisions.

What are the expected returns and risks of this long-term capital investment decision? We simply do not know. We are making decisions between an unchangeable past and an unknowable future. We don't know the circumstances that will arise, and as John Hicks put it in his *Causality in Economics*,[9] 'people know that they just don't know'. By the late 1970s, Hicks, the co-founder of the first neoclassical synthesis, had gone a long way towards becoming Hicks, the Post-Keynesian—far closer to Davidson and Shackle in some of his views than to Samuelson and Tobin.

This means that the rational expectations of decision-makers in modern orthodox general equilibrium models are either infeasible, or have to be interpreted in such a way as to be tautological and essentially meaningless. In a similar context, and many years before any formal definition of rational expectations existed, Keynes had referred to the 'pseudo-rationalistic notions' of the 'extraordinary contraption of the Benthamite School'.

Uncertainty is central to the economics of Keynes. As Hyman Minsky put it,[10] 'Keynes without uncertainty is something like Hamlet without the Prince'. A sophisticated understanding of the nature of uncertainty is a starting point for understanding the following:

- the importance of liquidity and the special role of money in an uncertain capitalist economy;
- the reasons why money and finance can never be neutral;
- the causes of path dependence in the economy, and of cumulative causation;
- the inadequacy of the efficient markets hypothesis as compared to a liquidity preference theory as an explanation of the behaviour of financial markets over time;
- the volatility of investment spending;
- the operation of the economy as a complex social system; and
- the tendency of the economy towards instability and disequilibrium at it evolves over time, as described by Minsky.

Roy Harrod wrote in the appendix to his *Life of John Maynard Keynes* of the influences of philosophers like David Hume, G. E. Moore, and Bertrand Russell on Keynes' views on probability. Keynes did not regard the notion of objective probability as outlined by the relative frequency school—the founders of probability theory—as being of much value. He had a more eclectic and sophisticated understanding of uncertainty than Paul Davidson sometimes portrays, including ontological uncertainty, but not limited to it.

He did not view probability as a description of the relative likelihood of an event, but rather as a representation of the evidence for a proposition. '*Keynes insists that this expression may have values lying between certainty and impossibility that are incapable of precise numerical expression*'.[11] For Keynes, it is not only the subjective probability relating to a proposition which is of importance for decision-making, but also the degree of belief or confidence in that subjective probability. In orthodox economics, there is no distinction between probability and degree of belief: for Keynes, they are separate concepts.

Where beliefs regarding subjective probabilities are not held with confidence and are subject to revision in the light of surprising new evidence, then the degree of belief a decision-maker has in their existing subjective assessments of the probabilities is of importance for

understanding the way they make decisions. The weight with which the evidence for a subjective probability is held is a separate concept to that of estimated probability itself, and both concepts influence the decision weight applied to the associated outcome by the decision-maker. New evidence might reduce a subjective probability, but can increase the weighting we give to a proposition in forming our expectations of the future, because we become more confident that our expectations have some validity.

So Keynesian uncertainty is often ontological, as described by Paul Davidson, but can be epistemological and even consistent with subjective quantifiable beliefs. The degree of confidence in those beliefs is then of vital significance. It is of interest that modern psychological research relating to risk and uncertainty provides evidence in favour of Keynes' sophisticated approach, as will be shown in Chapter 4.

Even so, the Keynesian analysis of uncertainty and the consequences of uncertainty has been progressively and all but eliminated from economics since 1945. This has occurred to such an extent by now that many textbooks and courses at leading universities with titles such as 'decision making under conditions of risk and uncertainty' make no distinction between the two circumstances, and even leading economists commonly use the terms 'risk' and 'uncertainty' interchangeably.

It is an omission of which orthodox neoclassical-synthesis Keynesians have always been guilty. This omission has encouraged them to accept the long-run validity of the orthodox axioms that Davidson has argued Keynes was seeking to reject. Among other errors, this has led to the interpretation of liquidity preference theory as a narrow theory of the demand for money, rather than as a broad psychological theory of financial markets, and the incorporation of that narrow theory into the IS-LM model; which was itself at the heart of the first neoclassical synthesis, and the incorporation of 'bastard Keynesianism' into the frame of orthodox economics.

Both Davidson and Minsky understood Keynes's liquidity preference theory as a psychological theory of the demand for money and other apparently liquid assets under conditions of uncertainty, and as the basis of an alternative and more realistic description of the role of non-neutral money and finance in a monetary economy than the efficient markets theory which was developed within the orthodoxy.

Keynes supplied us with the following foundations for a theory of money and finance:

- The statement that '*the importance of money essentially flows from its being a link between the present and the future*'—a time machine for our purchasing power. Keynes stressed an understanding of the role of money as a fully liquid store of value as essential to an understanding of the operation of a monetary economy.
- An equation for *'the total return expected from the ownership of an asset over a period', which in its full form was* $(q + a - c + l)$:

$q =$ income yield (which can be implicit, such as the flow of services from a house or other durable good, or explicit, as in dividends from a stock)
$a =$ anticipated capital gain
$c =$ carrying cost (which can be defined to include depreciation, where real assets are concerned)
$l =$ liquidity premium

In *The General Theory*, money is non-interest bearing; it cannot generate a capital gain (in terms of itself); and it has no significant carrying cost. The only yield available from holding non-interest bearing money is its liquidity premium (l).

This is not to say that Keynes was specifying that money had to be defined in this way. He states that 'we can draw the line between "money" and "debts" at whatever point is most convenient for handling a particular problem'.[12] However, in *The General Theory* money has perfect liquidity, but no income yield, capital gain or carrying cost (other than inflation). It is 'co-extensive with (non-interest bearing and sight) bank deposits'.

- A statement of the following two 'essential properties of money':

> (1) money has, both in the long and in the short period, a zero, or at any rate a very small, elasticity of production, so far as the power of private enterprise is concerned, as distinct from the monetary authority…money cannot be readily produced by labour;
>
> (2) it has an elasticity of substitution equal, or nearly equal, to zero…money is a bottomless sink for purchasing power.

It is important not to misunderstand these statements. They do not imply that the banking system cannot facilitate an increase in the supply of credit money to match an increase in demand. They instead imply that

an increase in liquidity preference during a financial crisis, and a consequent decrease in the demand for and supply of credit, in the prices of risky assets, and of effective demand, cannot be alleviated by the physical production of money (as though money was a commodity or a good which could be produced by workers in factories, rather than a financial liability), and will instead lead to an increase in unemployment. Moreover, that under these circumstances there is no feasible change in the money prices of goods and services or the price of labour which can restore full employment.

The only institution with the power to curtail a deep recession when people insist on saving more, spending less, and holding their savings in the form of safe assets is the monetary sovereign government, incorporating the central bank.

- The following short statement from his paper in the *Quarterly Journal of Economics*:

> different types of assets satisfy the desire for liquidity in different degree.

This paper reminds us that liquidity preference theory is a theory of finance generally—a psychological rather than an efficient markets theory—and not just a theory of the demand for money.

- This longer extract from the same paper:

> Why should anyone outside a lunatic asylum wish to use money as a store of wealth? Because, partly on reasonable and partly on instinctive grounds, our desire to hold Money as a store of wealth is a barometer of the degree of our distrust of our own calculations and conventions concerning the future. Even though this feeling about Money is itself conventional or instinctive, it operates, so to speak, at a deeper level of our motivation. It takes charge at the moments when the higher, more precarious conventions have weakened. The possession of actual money lulls our disquietude; and the premium which we require to make us part with money is the measure of the degree of our disquietude.

This is one of Keynes's clearest statements on the significance of the precautionary demand for liquidity, which is often strangely neglected by orthodox economists, who nonetheless describe themselves as (Neo or New) 'Keynesians'.

It is upon these elements that Davidson and others have constructed modern interpretations of the liquidity preference theory of financial markets.

In an uncertain world, spot and forward contracts, sticky prices, legal enforcement and money provide a stable enough framework to allow a capitalist economy to function. Contractual agreements allow us to plan for the future and set up in advance a schedule of anticipated incomes and outgoings that we can with some degree of confidence expect to arise.

Based on our existing and anticipated future wealth and our current disposable incomes; our confidence or insecurity that these expectations will at least be met; and given the level of consumption we are habituated to, the reference groups we identify with or seek to emulate, and the availability and cost of credit; we decide how much to spend on the output of industry and how much to net borrow or save in the form of money and other liquid financial assets.

In Keynesian economics, households do not for the most part save in the form of illiquid physical assets. Indeed, as Davidson has explained, in *The General Theory*, the direct accumulation of real assets by households is regarded as a form of what is perhaps mislabelled as 'consumption', thereby contributing to effective demand and to employment, and there is a distinction between capital investment decisions, made within businesses, and decisions on the acquisition of shares in businesses, made mainly by or on behalf of households. Big businesses and households are distinct decision-making units, with a divorce of ownership from control within corporations, and households for the most part not directly purchasing the means of production.

Household saving takes the form of the acquisition of liquid financial assets. This produces a two-stage process in the savings decision:

- Firstly, the consumption versus saving decision—in Keynes, saving here is mainly seen as a residual, in the context of the theory of the consumption function.
- Secondly, portfolio choice—the decision regarding which financial assets to hold.

Davidson defines money as a '*fully liquid asset*'. To the extent that we face known or contingent future financial obligations denominated in terms of money, the only certain way of guarding against insolvency is to hold some of our wealth in the form of the monetary asset. Money is defined as the asset with the maximum possible liquidity premium.

Under normal circumstances, we will hold some of our wealth in the form of money and the rest in the form of other liquid assets, such as term deposits, and holdings of securities such as various forms of bonds, equities and managed funds. In recent years, derivative contracts have joining the list of apparently liquid financial assets.

In particular during periods of rising property markets, although physical property is not a genuinely liquid asset, it may come to be regarded as such.

Liquid financial assets have a yield, expressed in Keynesian terms, of $q + a + l$. In terms of equities, q represents an anticipated dividend yield, a is the expected capital gain and l is inversely related to some subjective measure of the possibility of loss. It is tempting then to map Keynesian uncertainty in liquidity preference theory into a subjective measure of risk in the neoclassical modern theory of finance; define risk in terms of the expected periodic standard deviation of returns; and move on to portfolio theory and the rest of the efficient market approach to finance.

This, however, would be misleading. The assumption of normality built into the estimation of risk in modern finance theory is flawed, and speculative financial markets, though they go through periods of tranquillity, are often far more volatile places and more subject to bubbles and panics than the efficient market theory implies.

Merging Keynes inappropriately into the efficient markets theory was the route taken by James Tobin in his portfolio balance approach to financial markets, which involved ignoring the uncertainty and psychological perspective of Keynes's analysis, and accepting the ergodic hypothesis of neoclassical theory. James Tobin, like Paul Samuelson, despite his brilliance, got Keynes wrong.

Asset markets are admittedly almost the only place where prices do move towards market clearing positions, and according to liquidity preference theory this will involve portfolio choices so that $(q_i + a_i)$ equals $(l_m - l_i)$, where l_m is the premium that money carries as the fully liquid asset and l_i is the premium carried by the less than fully liquid asset class.

In general terms, liquidity refers to the ease, freedom from uncertainty of value, and in particular, freedom from significant loss with which an asset can be converted into the form of money. On financial markets, liquidity is in part the result of an orderly market structure. In an orderly market, mechanisms exist whereby participants can be confident that there will be continuous trading and no significant discontinuities in market prices.

Paul Davidson has emphasised the misunderstanding among many participants in the new markets for asset-backed securities and credit default swaps prior to 2008, which led them to believe they were holding assets traded within an orderly market structure when it was not the case.

An increase in the precautionary demand for money involves a move by the private sector towards holding wealth in the form of more liquid assets. This in itself will trigger a portfolio shift out of more uncertain financial assets, as the additional liquidity premium on money becomes more prized, while the anticipated values of q and a for less than fully liquid financial assets are likely to have fallen.

The absence of a buyer-of-last-resort in risky asset markets, when market participants are racing for the door, can then trigger a collapse. This is exactly what happened on some financial markets—particularly for the newer derivatives—in the USA in 2008. Both a and q have fallen, and $(l_m - l_i)$ has discontinuously increased, as the demand for the security of fully liquid assets increases, and the perceived liquidity of assets previously seen to have a high level of liquidity collapses, in failing markets. Fully liquid assets in a crisis include the domestic currency debt of monetary sovereign governments, which explains the flight to US government securities in 2008.

It is uncertainty that creates both a demand for liquidity, or you could say for safe assets, and changes over time in the value of the additional liquidity premium on holding money as a safe asset. During periods of tranquillity and relatively stable but rising asset markets, the role of money in private asset portfolios is reduced, and there is a shift towards less liquid and more risky assets. At the same time, there is a willingness on the part of borrowers to accumulate more debt and more fragile financing structures. This is where Davidson's interpretation of Keynes's Liquidity Preference Theory and Minsky's evolutionary Financial Instability Hypothesis fit together very neatly.

Hyman Minsky and Financial Instability

Davidson has focused on the role of uncertainty in creating underemployment equilibrium outcomes in the Keynesian model. Hyman Minsky concentrated instead on the upward instability which generates financial fragility and endogenously generated downturns, again within Keynes' model of the economy.

Minsky shared Keynes' vision of the role of uncertainty and degrees of belief in destabilising financial markets and the real economy. In *The General Theory*, 'Keynes put forth an investment theory of fluctuations in real demand and a financial theory of fluctuations in real investment'. He did not fully develop the financial theory, and moreover, his references to it are sometimes obscured by a milder form of non-financial cyclical behaviour described in Chapter 18 of *The General Theory*. However, in Chapters 12 and 22, and in his subsequent writing, there are the essentials of '*a vigorous cycle, which does have booms and crises*'[13]—a system driven by finance and uncertainty, consistent with the US boom of the 1920s, and the subsequent crash into depression after 1929, or the so-called Great Moderation and the 'Great Recession' of the 2000s.

Keynes left clues, but did not provide a complete model of a system where financial crises can strike with 'catastrophic force'. For such a model, we must turn to Minsky and the financial instability hypothesis. An understanding of Minsky's extension of Keynes' model has fundamental implications for the conduct of economic and regulatory policies: 'Because the financial instability hypothesis leads to a different view of the normal functioning of capitalist economies, it has implications for economic policy that differ from those of the standard economic theory of our time'.[14]

For both Keynes and Minsky, the orthodox neoclassical model is at best outdated, and likely to be highly misleading, in that it takes the focus away from the major sources of recurrent instability. 'Whereas classical economics and the neoclassical synthesis are based upon a barter paradigm – the image is of a yeoman or a craftsman trading in a village market – Keynesian theory rests upon a speculative financial paradigm – the image is of a banker making his deals on Wall Street'.[15]

That banker is participating in a financial system which plays a vital role in the capital development of the economy, by providing much of the funding for business investment. Investment spending is both a vital determinant of the future productive capacity of the economy and also easily the most variable element in current spending (Fig. 3.1).

Having identified investment spending as the most volatile element in effective demand, and therefore as the most obvious immediate cause of business cycle fluctuations, Keynes discussed the determinants of private fixed capital investment, using both the well-known marginal efficiency of capital approach and his less discussed two-price theory. In terms of modern business finance, these approaches are analogous to the distinction between the internal rate of return and the net present value investment concepts.

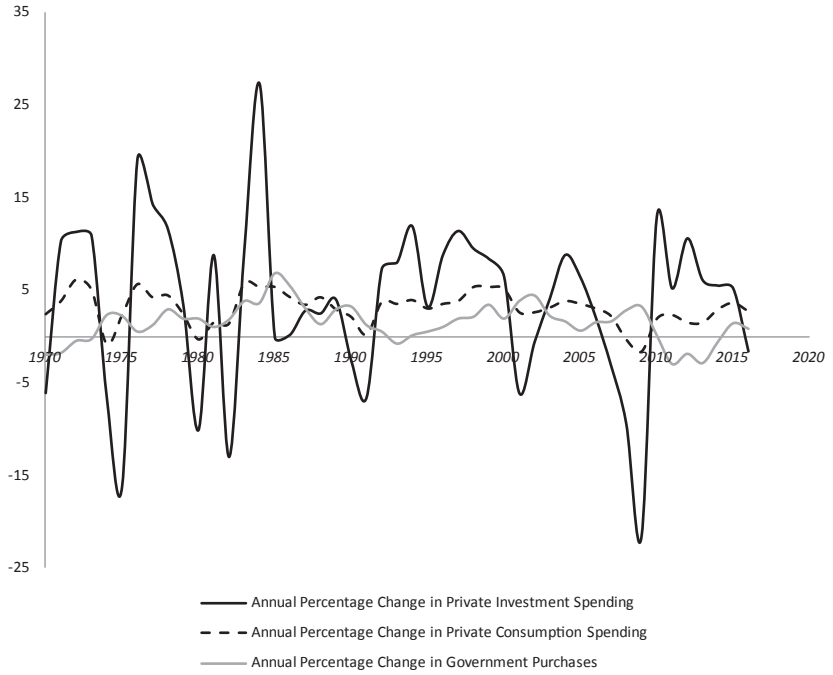

Fig. 3.1 Variations in the annual rates of growth of consumption, investment and government purchases in the USA (*Source* Federal Reserve Economic Data. Federal Reserve Bank of St. Louis)

Minsky's version of the Keynesian two-price model is central to his analytical framework. It is linked to his subsequent discussion of hedge, speculative and Ponzi financing; and even to his discussion of an evolution from the 'managerial capitalism' of the immediately post-war years to the crisis-prone 'money-manager capitalism' which had supplanted it by the time of his death in 1996. In its original form, it relates to the financing of capital assets within business organisations. However, with only slight amendments it is readily applicable to the issue of rising household indebtedness in a rising property market (Fig. 3.2).

The two prices are the supply price and the demand price of new capital goods. The relatively stable supply price is determined just like the prices of any manufactured goods, with a markup on production costs, which reflects the cost of short-term commercial finance and the degree of monopoly in the capital goods sector. The relevant intercept represents

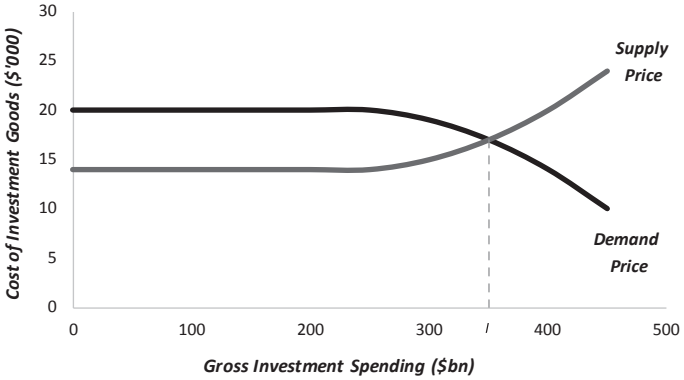

Fig. 3.2 Minsky's Keynesian two-price model of investment

the resulting purchase cost of a newly produced representative capital good. The supply price is constant, up to the point where investment spending can no longer be financed entirely out of retained earnings.

The more volatile demand price involves either a subjective managerial estimate of the present value of the future net cash flows that new capital equipment can be expected to generate, where both forecasts of future cash flows and the discount rate are highly subjective and prone to discontinuous change, or the price of existing capital goods as reflected in equity prices on the stock market, which are even more prone to volatility. There is no assumption of diminishing marginal physical productivity, nor necessarily an assumption of a diminishing marginal efficiency of capital.

To an orthodox economist, the managerial and stock market valuations ought to be the same thing, being set in efficient financial markets, with prices reflecting objective estimates of expected cash flows and discount rates based on systematic risks, and a market risk premium reflecting average investor risk aversion. The orthodox story is one of relative stability in an ergodic environment.

The demand price of capital goods identified by Keynes and Minsky is more complex, being determined in a world where managers make decisions with the aim of corporate survival and growth, and where finance and financial markets both facilitate capitalist development and create its primary source of instability. If we take the managerial estimate as the basis for valuing new capital goods, we must refer to Keynesian uncertainty and the role of animal spirits.

Minsky emphasises current corporate cash flows as a link between the past, the present and the future, in that they must: (1) cover the cash flow obligations which are the result of previous investment and financing decisions; (2) provide a source of finance for current investments which does not involve the emission of new financial liabilities; and finally, (3) influence expectations of those future uncertain cash flows which are the reason for current investments in new long-lived capital assets. Since capital assets are generally illiquid and capital investment decisions often irreversible and crucial for the future performance and survival of a business, the precariousness of expectations regarding future cash flows reinforces the potential for instability.

Previous investment and financing decisions have created the current corporate balance sheet, which is the starting point for this year's decisions. Current decisions imply further changes to the balance sheet, which will create future obligations, including interest payments on debt and dividends to shareholders.

Rising share values increase the borrowing capacity of listed firms, increase the confidence level of business executives and bankers, and encourage the erosion of margins of safety and changing attitudes towards external finance. Minsky's analysis incorporates what Keynes called 'lender's risk' and 'borrower's risk', and also draws on Michal Kalecki's 'principle of increasing risk'.

Lender's risk 'shows up in financial contracts in various forms: higher interest rates, shorter terms to maturity, a requirement to pledge specific assets as collateral, and restrictions in dividend payouts and further borrowing are some of them'.[16] It refers to the additional explicit and implicit costs of acquiring new capital goods which are born by a firm when additional external finance is used to finance such acquisitions. The existence of lender's risk increases the value of the net supply price of new capital goods, where, in this context, net supply price is the purchase price of capital goods plus marginal lender's risk.

Borrower's risk refers to the erosion of margins of safety in uncertain future corporate cash flows, as liquidity is reduced and financial commitments are increased by increasing the ratio of investment that is debt financed (or at least paid for using external finance, as opposed to retained earnings). The existence of borrower's risk reduces the marginal valuation of new capital goods, decreasing the net demand price.

This is not the stable and equilibrium world of the orthodox neoclassical theory of capital structure decisions and investment financing. It

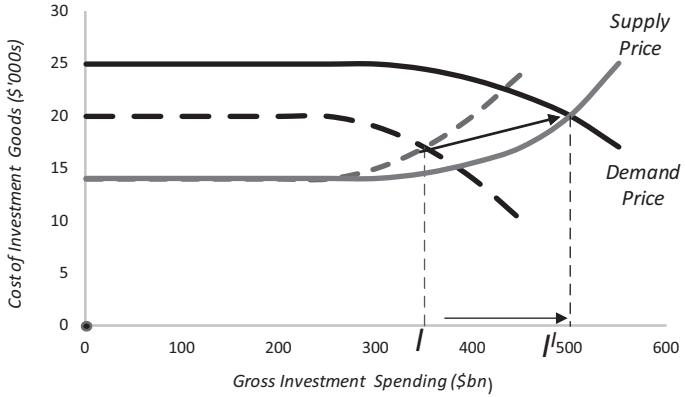

Fig. 3.3 Investment spending during a period of euphoria

is the real world of uncertainty, shifting conventional attitudes towards illiquidity and acceptable financing structures, and a potentially volatile stock market. If we are to refer to the intersection between the schedules as an equilibrium, it is a shifting one, with cycles characterised by upward immobility followed by discontinuous downturns during crises.

A period of relative stability and prosperity increases business optimism, moving the demand price of new capital upwards, improves current corporate cash flows, so that it is now possible to fund higher levels of investment without the need for additional external finance, and reduces both borrower's risk and lender's risk. In this way, economic recovery can lead to euphoria, and stability can breed instability. The impact of these developments on investment spending is shown in the chart (Fig. 3.3).

Minsky added a sophisticated balance sheet perspective to the above analysis, based on a distinction between hedge, speculative and Ponzi financing. Hedge financing implies that the anticipated operating cash flows of a business (or other economic agent) are sufficient to repay both interest and the principal on accumulated financial liabilities. Speculative financing implies that cash flows are at least sufficient to cover interest obligations, but that the business (or other borrower) needs to roll over debt as it matures to remain solvent. Finally, Ponzi financing implies that cash flows are insufficient even to cover interest obligations, so that the borrower needs to issue additional debt to raise the cash to service its existing interest obligations.

Users of hedge financing have robust balance sheets. In the absence of a significant unanticipated downturn in operating cash flows, they are not exposed to potential financial distress caused by increasing liquidity preference in the financial system.

Those with speculative financing, and of course there is a continuum of speculative financing profiles, have potentially fragile balance sheets—particularly if their liabilities are short term in nature. A downturn in financial markets and a tightening of lending by financial institutions could lead to forced asset sales and, potentially, given falling asset markets, insolvency.

Ponzi financing is unsustainable (hence the name), and Ponzi balance sheets can only be rational in any sense of the term where capital gains and/or future increases in net cash flows facilitated by current debt financing can credibly be expected to justify a gamble on a highly fragile current balance sheet position. Even if this is realistic, any near-term tightening in financial markets or lending practices will force asset sales and threaten insolvency.

In the original version of Minsky's financial instability hypothesis, the two-price model of investment is combined with this classification of financing structures. The result is a model of endogenous instability, consisting of mild short-run cycles, and a long-run tendency towards growing financial fragility and an eventual crash, or 'Minsky Moment'.

During the years immediately following a crash, both borrowers and lenders retain conservative attitudes towards balance sheet positions. Businesses and households seek to accumulate net financial assets and to establish and maintain robust balance sheets. Paul Davidson would say there is a high degree of liquidity preference on financial markets. Financial regulators act to regulate financing practices and the uses of those financial innovations which are perceived to have contributed to the crash, which is still fresh in the collective memory of all. At least some economists have their faith in efficient markets and stable growth equilibrium undermined, and, in response, will be more questioning than before of laissez-faire and financial deregulation. They may even re-read *The General Theory*.

In the context of the two-price model, there is a higher degree of borrower's risk and lender's risk, and, in addition, depressed animal spirits regarding anticipated net cash flows from both existing and newly acquired capital assets. The demand price curve shifts down, and both the demand price and supply price curves increase their curvature. Investment spending collapses during a debt deflation.

The provision of liquidity by the central bank and the running of large fiscal deficits by the central government can put a floor under financial markets and corporate cash flows, and in time initiate a sustainable economic recovery. The role that 'Big Government' can play in promoting recovery via the multiplier was of course a central message of *The General Theory*. Minsky added his more sophisticated description of financing, and also Kalecki's analysis of the determinants of corporate profits, to build a fuller analysis of the importance of large fiscal deficits following a major downturn.

In addition to the multiplier effect on aggregate demand, the Kalecki equation demonstrates the importance of a government deficit for the maintenance of corporate profits—both as a source of internal (hedge) finance for investment and as a positive influence on expected future cash flows and the demand price of new capital.

The Kalecki equation in an economy with no government and no foreign trade, where all labour income is spent and capital income saved, is easily derived from the national income accounting identity, as:

$$\Pi = I, \tag{3.1}$$

where Π denotes corporate profits; I denotes business investment; and causation is assumed to run from right to left. Businesses cannot decide to make more profit, but they can make decisions relating to investment spending, and moreover investment plans take place in advance of the current time period. In Kalecki, workers spend what they earn and capitalists earn what they spend, as Nicholas Kaldor put it. If workers spend all their wage income, then the surplus capitalists enjoy over their labour costs can only be derived from the capitalists' own expenditure. If all capital income is saved and none is used for consumption, then this expenditure must be investment spending.

Introducing consumption out of capital income (C_π); saving out of wage income (S_w); a government budget (BD = fiscal deficit); and a foreign sector (CA = current account balance), the Kalecki equation becomes:

$$\Pi = I + \mathrm{BD} + \mathrm{CA} - S_W + C_\Pi. \tag{3.2}$$

Business (after tax) profits are given by investment spending, the government deficit, the current account balance, less household saving out of wages, plus household consumption out of capital income. This is based on the national income accounting identity, and on the hypothesis that the principal direction of causation is from right to left.

The role of the fiscal deficit in promoting the recovery of investment spending is obvious. Following an actual or near debt deflation, the propensity to save (and liquidity preference) increases; *I* (of course) collapses; and, in a global downturn, the prospects for a shift in trade towards surplus will be limited.

Under these circumstances, the only factor supporting corporate profitability is a rising government deficit. Far from 'crowding out' private-sector investment spending—as might appear to be the case close to full employment where a Taylor-rule following central bank deliberately offsets shifts in fiscal policy via changes in the policy interest rate—after a crisis, fiscal deficits crucially provide the cash flows necessary to drive the recovery of investment spending based on conservative hedge financing. Government spending 'crowds in' private spending, including investment spending.

The third role played by fiscal deficits after a crisis is the provision of a series of default risk-free financial assets to the private sector of varying maturities, meeting the needs of the private sector (and especially banks and other financial institutions) for safe and highly liquid assets, as they seek to restore their balance sheet positions to a more conservative state. If the non-government sector of the economy, including the foreign sector, wishes to net save, then the only source of nominally safe domestic currency assets is the monetary sovereign domestic government. In the absence of conventional fiscal action to bring this about, the central bank may undertake quasi-fiscal policy itself (fiscal, in the sense that prices are paid for assets which are above what would otherwise be their market values, so that the actions of the central bank directly increase private financial wealth), by swapping such safe assets for risky assets in falling markets, in order to forestall a collapse in the prices of those risky assets and a debt deflation.

So, what may be seen by conventional standards as large fiscal deficits—and the US Federal deficit was 9.8% of GDP in 2009, 8.7% in 2010 and 8.5% in 2011—far from destabilising the system, are essential to its stability and to creating the initial conditions for expansion following a crisis. They maintain demand and employment, maintain profits and encourage private investment, and allow the private sector to move collectively from speculative and Ponzi balance sheets to conservative hedge financing. The government budget plays a vital role in stabilising an unstable economy.

The emission of government liabilities during the 1930s and especially during the 1939–1945 war generated a particular and beneficial set of circumstances in the early 1950s. The financial conditions were in place for 'success', starting with a highly robust set of private balance sheets, made possible by large-scale government debt issuance. The initial conditions for a long upswing were ideal.

The 1950s and 1960s were in the most important respects a more successful period than the Great Moderation of 1992–2007. Economies grew more quickly, the distribution of income and wealth became more equitable, broadly defined measures of welfare such as the Genuine Progress Indicator would have increased substantially, and full employment was maintained, with no major inflation break out, and no major financial crisis.

The absence of financial crises is worth emphasising. It is not a normal characteristic of capitalism to go through such a long period without a systemic financial crisis. Yet Hyman Minsky was aware that the financial system was evolving from the super-secure one of the early 1950s towards an increasingly fragile state, and that something very like the crash of 1929 could easily happen again, and was eventually almost inevitable.

For Minsky, the fundamental instability in capitalism is upwards, as investment spending increases and balance sheets become gradually more adventurous. Rising business confidence and profits shift the demand price of new capital upwards and diminish both borrower's risk and lender's risk.

Improving business cash flows justify previous investment and financing decisions, thus tending to raise retained earnings, increase the market value of equity, and reduce the ratio of debt to equity on corporate balance sheets. The impact of rising profits in an accelerating economy is to legitimise past financing practices and to make balance sheets appear more conservative.

This further reduces lender's and borrower's risk, encourages even higher levels of investment spending and leads to the use of further external finance and increased gearing. Businesses using higher levels of debt to expand are most successful, with higher levels of leverage multiplying returns to shareholders. Financing decisions move corporate balance sheets back towards more speculative and less robust positions.

While real GDP grows sufficiently to validate existing financial structures, there is a general decrease in liquidity preference and risk perception and aversion, a relaxation of attitudes and practices by borrowers, lenders, regulators and policy-makers, and an apparent justification of these attitudes based on low default rates, high levels of investment and profitability, and strong market value/book value stock ratios.

A private sector that is accumulating net financial liabilities also allows the government budget to move towards surplus with a constant or even a deteriorating international trade balance. The government is able to congratulate itself on its fiscal discipline and sound economic management, even while the economy is evolving in a highly unsustainable manner, with private balance sheets becoming increasingly dangerous.

The trigger for a discontinuous downturn can take a variety of forms. It could arise outside the domestic economy; it could be the collapse of a particular speculative asset price; it could result from rising cost-push pressures; or it could be demand pull inflation, or some combination of these. The trigger could be a small rise in the policy interest rate, or some other policy to tighten aggregate demand. In Minsky's analysis, rising inflation and a consequently tighter monetary policy are generally the trigger. Falling asset prices, rising liquidity preference, a greater awareness of and aversion to further uncertainty, and a deteriorating outlook for future earnings drive agents with fragile balance sheets into illiquidity and potential insolvency.

Prior to the 1930s, such crises could and generally did happen frequently, and at early stages during capitalist expansions, and were followed by a series of bankruptcies and bank failures, until balance sheets and financing practices had become more conservative. Bankruptcies and failures created a new set of initial conditions, eventually facilitating the next upswing. After the Great Depression, the Roosevelt New Deal and the Second World War, circumstances were different. A different set of institutional structures and constraints was in place, alongside a different framework for economic policy and different social attitudes.

Minsky understood the role played by those particular historical circumstances in allowing for the long period of moderate inflation and close to full employment, under a form of shared prosperity capitalism, with virtually continuous increases in median real wages, and falling income and wealth inequality. 'The trade-off between the full employment and inflation of the 1960s and 1970s was the result of the particular institutional structure of the time'.[17]

Most of all, the Great Depression, World War II and Keynes had left as a legacy Minsky's Big Government and Big Bank. The Big Bank was the lender-of-last-resort and the financial asset buyer-of-last-resort, which acted to abort incipient financial crises. The Big Government was an institution with a large enough budget to stop 'it' (a major downturn) through counter-cyclical movements in the fiscal deficit. Persistent government fiscal deficits allowed the private sector to consistently net save in a growing economy.

What this meant was that when financial institutions at last began to innovate and take more risks, in search of rising profits, and when non-bank balance sheets began to become more adventurous, the early financial disturbances in the USA in the 1960s and 1970s could easily be mitigated, with minimal lasting effects on the real economy.

These episodes did not lead to the waves of bank failures and debt deflation of previous financial crises, thanks to the two modern institutions which were now at the heart of the US capitalist system.

Consequently, they did not promote a significant and lasting shift to more conservative private balance sheets and financing practices, but rather the reverse. Bankers and others now knew that the system could not and would not be allowed to fail, and that some institutions and markets had grown too large to be allowed to fail. The impact of the Fed's lender-of-last-resort interventions during the 1970s on banking and on financial markets is described in detail in Minsky's *Stabilising an Unstable Economy*.

Just as a 'Big Government' stabilises the economy across the cycle, so a 'Big (Central) Bank' (temporarily) stabilises the financial system. The temporary nature of this stability is due to the actions of the central bank effectively validating the financing practices that created the incipient crisis. The use of last-resort intervention (and counter-cyclical fiscal policy) to save the system from collapse prevents a full awareness of the growing fragility of the system and creates conditions conducive to the next round of profit-seeking financial innovations and the development of the next bubble. This is in a sense the famous 'moral hazard' problem. However, it is a nuanced version of the problem, relative to that described in the textbooks, with a more complex psychology, encompassing not only commercial and investment bankers, fund managers and business managers, but also policy-makers and academic economists.

The ability of policy-makers to rescue a failing capitalist financing system, and to allow economists to cling to and be reinforced in a belief of stable and efficient financial markets, encourages a climate of progressive deregulation and accelerating innovations which add to the underlying fragility of the system. Successive rescues, in Minsky's day, accommodated inflationary pressures, leading to the next crisis. From the early 1990s, the danger of a crisis emerging which would be difficult or impossible to manage—at least within the current institutional framework—became much greater than before.

This can be described as Minsky's Paradox. An appropriate institutional and regulatory framework and set of balance sheets, allowing for full employment and financial stability, encourages orthodox economists to argue that capitalism is self-correcting and to advocate for the removal of the very institutions, regulations and financial flows which allowed for the full employment and financial stability in the first place.

By the mid-1990s, the network of social and economic influences on inflation and the financial system had changed fundamentally. At this point there was:

- Globalisation; the increased mobility of capital; accelerating technological change; the rise of emerging economies; the restructuring of high-income economies; a period of high unemployment; labour market deregulation; and the decrease in trade union membership and power, that had changed the balance of power in the labour market, making wage led cost-push inflation less likely.
- The market for energy had also changed, so that a prolonged spike in oil and other commodity prices was a less likely consequence of institutional factors.
- Inflation rates had been reduced, in large part due to the supply of cheap goods made possible by cheap labour in low income and emerging economies, and also due to an institutional framework devised to encourage expectations of low, stable inflation in the future. A major element in this framework in many countries was apparently independent central banks setting policy interest rates based on an explicit or implicit inflation targeting (or Taylor rule) regime.
- Apparent reduced government involvement in the economy (outside of the kind of welfare systems of which Minsky strongly disapproved as both wasteful and inflationary, and of military spending) which was both a reaction to and a consequence of changing social norms and attitudes. In reality, governments were heavily involved in the financialisation of the economy, and in shifting the balance of power away from labour and towards capital.

The social conditions for low and stable consumer price inflation and the advances in information technology meant that the increasingly deregulated financial system of the 'Great Moderation' period could take dangerous financial innovation further and faster than before. Policy-makers and economists were under the illusion that financial markets were at

least approximately efficient; that new derivatives would spread risks and allocate them to those best placed and most prepared to bear them; and that the accelerating globalisation of the financial system was a source of stability and not potentially catastrophic instability. The attitude of the Clinton administration was that minimal financial regulation and consistent government surpluses were both appropriate and sustainable.

Then, just two terms after Clinton, 'it' very nearly happened again, as the world went into its Minsky Moment. Battered copies of Minsky's great and completely ignored (and at the time out of print) 'Stabilising' book started trading for hundreds of dollars on the internet. This and Hyman Minsky's other books were rushed back into print, and policy-makers, and even mainstream economists, at least for a short while started taking Minsky's analysis seriously.

It was almost inevitable that the next step would be to do to Minsky what they had done to Keynes—that is, attempt to incorporate some parts of Minsky's analysis into an essentially core equilibrium model, and omit and ignore the vital elements of Minsky (and of Keynes) which are entirely inconsistent with the model. This is now happening, as orthodox economists strive to incorporate financial institutions and sudden and inexplicable shifts in risk aversion into their general equilibrium models.

They continue to ignore, for the most part, Minsky's 'anti-laissez faire theorem'—the need for effective instability thwarting mechanisms, to react to and limit the consequences of the endogenous instability, which is a characteristic of modern, financial, entrepreneurial capitalism. Orthodox economics has abstracted away the institutional and behavioural basis for the Keynesian model, as explained and developed by Davidson, Minsky and others.

Minsky's comment that '*stability breeds instability*' and Keynes's view that decision-makers in both short-run and long-run decisions base 'their expectations on the assumption that the most recently realised results will continue, except in so far as there are definite reasons for expecting a change', could have been written by a modern behavioural economist.[18]

The New Keynesians of 2005, the Neo-Keynesians of 1965 and Irving Fisher back in 1929, all believed they had tamed the cycle and permanently abolished prolonged downturns. They mistook what were temporary social and institutional frameworks in an evolving and complex system for increasingly skilled decision-making by those aided by the latest economic models, produced within a discipline of progressive linear advances in methods and techniques. They were badly misled by their model. Such is the human capacity for self-delusion.

This is one of the most important reasons we need to replace the orthodox model and the orthodox consensus on appropriate macroeconomic management. Our replacement model needs some Minskian foundations—money, finance and social institutions are essential features, as are complexity and evolutionary changes, which are difficult and sometimes impossible to foresee. This is not the world of the 'optimal monetary policy' so beloved of monetary economists of the 1990s and 2000s. Nor is it the world of the 'fine tuning' of the 1960s fiscal activists. It is a world where appropriate 'instability thwarting mechanisms' are essential for the avoidance of crisis, and where it is better to avoid crises and to satisfice than to attempt to optimise based on a flawed model that will only contribute to the next major crisis.

During Minsky's career, the main private-sector borrowers were businesses, and debt was created mainly to finance investments in newly produced capital assets. The deregulation, competition and innovations of the 'Great Moderation' changed this. After the millennium, corporate balance sheets remained mainly robust, and the build-up of debt was centred on households, and particularly on the acquisition of already existing real estate. The potential triggers for a crisis were the stock market, the property market and household debt—Ponzi finance had invaded the household sector and the financial institutions directly or indirectly involved in real-estate finance. Ultimately, of course, the crisis was triggered by a downturn in the real-estate market.

A number of economists have argued that this was not a classical Minskian crisis, given that Minsky's 1970s model described a build-up of corporate, and not household, leverage.[19] However, students of Minsky and those inspired by Minsky, including Randall Wray,[20] have explained that Minsky's framework is the best available guide to making sense of the circumstances leading up to the crisis. Randall Wray argues that a crisis, such as the Great Recession, was the logical result of the evolution of the financial system and of policy-making that goes as far back as the 1950s. Hence, he has referred to a 'Minsky half century'.

Moreover, Minsky lived long enough to see and warn against the beginnings of the build-up of private household debt and was one of the first economists to warn of the risks of growing securitisation. Securitisation is another in the list of post-World War II financial innovations which have been associated with a form of investment boom, inevitably leading to a crisis built on the lost availability of a system memory

of major losses; regret avoidance by participants in the bubble; and the moral hazard of what became known as the 'Greenspan put' on asset markets.

We now have the essential elements for a hard monetary analysis of capitalism. It is an economic system which is inherently unstable and uncertain, and very different from the vision of a stable general equilibrium system provided by the soft real analysis of orthodox general equilibrium models.

Michal Kalecki and the Distribution of Income

Our model still requires a description of what determines the distribution of income. The best place to look for the essentials of such a theory is not Thomas Piketty's relatively recent and celebrated *Capital in the Twenty-First Century*. That book is rooted in neoclassical economics and portrays distribution as technologically determined by the very same production functions shown not to exist by Sraffa, Robinson and others. The distribution of income and wealth is determined in practice more by institutional issues, such as bargaining power and class conflict, rather than by technology. The best place to look for the essentials of such a theory, in my view, is in the work Michal Kalecki.

Kalecki explained that distribution is determined by what he called 'the degree of monopoly' in the economy. The higher the degree of monopoly, the higher will be the markup of prices over prime costs (labour and materials), and the lower the share of wages in national output.

A lower share for wages implies a higher share for capital income, which can be interpreted broadly to include incomes for the directors and senior executives of large oligopolistic organisations.

The degree of monopoly can be boosted over time by an increase in the average size of business organisations; by deregulation of the labour market and reduced trade union membership and bargaining power; and also by a form of globalisation which allows large businesses to shift production internationally, to locations with lower labour costs. All these factors limit the ability of labour to influence the markup of selling prices over labour costs and to defend the share of wages in output.

A neglect of Michal Kalecki is important today, when following years of denial, the impact of globalisation on bargaining power and national income distribution has only recently been accepted as significant by

orthodox economists. Even now, this acceptance is patchy and often very reluctant. It is a weak point in the argument for the further development of multi-national free trade agreements. It is hard for orthodox economists to argue that these are overwhelmingly beneficial, when in the US median hourly real wage rates have hardly increased in four decades, in spite of an obviously very significant increase in labour productivity.

This has also reduced the risk of an inflationary spiral, since inflation is usually caused by a social conflict between labour and capital, and between different socio-economic groups, where the weakening of the median worker's bargaining power reduces the pressure for such cost-push inflation.

It provides a compact explanation for the falling share of labour in national income and the increasingly uneven distribution of income. Moreover, the increase in the ratio of the market value of capital to national output identified by Thomas Piketty in *Capital* explains the pressure on company directors, and indirectly on governments, to further increase the degree of monopoly power, in support of the return on capital in an underemployed economy.

Once again, I am going to reproduce a few equations, because it is a useful way of describing Kalecki's argument. If the reader dislikes mathematical equations, they can be skimmed over, and the results taken on trust.

If P is the general price level and c is direct production costs (labour and materials), then

$$P = (1 + m) \cdot c, \tag{3.3}$$

where m is the markup and $(1 + m)$ 'the degree of monopoly'.

If Π is profits, O is overheads (including managerial salaries), W is wages and M is the costs of other inputs (which, if we are discussing the whole economy, can be interpret as imported, and to include imported oil, for example), and we are working on a before-tax basis, then

$$Y = \text{GDP} = \Pi + O + W \tag{3.4}$$

and

$$\Pi + O + W + M = (1 + m) \cdot (W + M) \tag{3.5}$$

or

$$Y + M = (1 + m) \cdot (W + M) \tag{3.6}$$

$$Y = W + m(W + M) \tag{3.7}$$

$$Y/W = 1 + m \cdot j, \tag{3.8}$$

where

$$j = (W + M)/W = 1 + M/W. \tag{3.9}$$

In which case, the share of wage labour in GDP, W/Y, is given by

$$W/Y = 1/(1 + m \cdot j). \tag{3.10}$$

Not surprisingly, an increase in 'the degree of monopoly' reduces the share of wage labour in GDP. The same is true of an increase in j, which is exactly what happened in the mid-1970s when the price of oil quadrupled in six months. The burst of inflation, and the period of industrial unrest which followed, before the neoliberals used mass unemployment and changes in employment legislation to promote the interests of capital against those of labour in the 1980s, was a consequence of workers resisting the fall in their share of GDP, which was essential if profits were to be maintained in a stagnating economy. In Kalecki's model, an increase in j raises the share of profit in GDP, while putting downward pressure on GDP.

Since the 1980s, much of the impetus behind deregulation, globalisation, and financialisation, and changes in the tax structure and accepted role for governments, has been about increasing Kalecki's degree of monopoly, and reducing the ability of workers to defend the share of wages in GDP.

While increasing $(1 + m)$ increases the profit share in GDP, it does nothing directly to increase the nominal value of after-tax profits, or the rate of return on capital. The level of after-tax profits is given by the equation used above to discuss Minsky's discussion of the role of budget deficits in a downturn.

$$\Pi = I + \mathrm{BD} + \mathrm{CA} - S_W + C_\Pi. \tag{3.2}$$

If consumption out of profit can be written as the marginal propensity to consume out of capital income (c_c) multiplied by after-tax profit, then (3.2) can be rewritten as

$$\Pi = \left(\frac{1}{1 - c_c}\right).[I + \text{BD} + \text{CA} - S_W]. \tag{3.2a}$$

Except in so far as an increase in the degree of monopoly should increase investment spending or consumption from capital income; or should be accompanied by a decrease in savings out of labour income; or a growing current account surplus or government deficit; then a higher degree of monopoly and share of profit in GDP will not increase the level of profit itself.

Taking the after-tax profit Eq. (3.2) and dividing by the share of profits in GDP, we get an equation for GDP itself:

$$Y = \frac{(I + \text{BD} + \text{CA} - S_W + C_\Pi)}{\pi/Y}. \tag{3.11}$$

Although the variables in the numerator of this expression are themselves not independent of the denominator, this expression is still a useful tool for illuminating the economic and financial policies pursued in many countries over much of the past thirty years.

As I have indicated above, the degree of monopoly and profit share have both risen in the high-income capitalist economies, which has been combined in most countries with a shift towards a lower share of national income paid out to labour and a less even distribution of both income and (especially) of wealth. This has a negative impact on effective demand, output and employment, which can only be offset if variables in the numerator increase in proportion to the increase in the profit share. These effects have been particularly clear in the USA (Fig. 3.4).

In order to combine an adverse shift in the distribution of income, that had resulted, in part, from an increase in the profit share and a fall in the share of labour income in GDP, with increasing demand and output, governments deregulated the financial system, and governments and central banks ran monetary policies designed to encourage an increase in household debt, as well as an increase in the ratio of household debt to GDP. This became particularly severe during the late 1990s and early 2000s and helped to drive the financial system towards increasing fragility.

It is tempting to see the key to a restoration of full employment in a decrease in the profit share in GDP and a rise in the share of labour income once again—particularly the income shares of groups in the lower and middle parts of the income distribution. It is of course correct that there is a role for a more even distribution of both income and wealth to play in the restoration of full employment.

However, modern monetary theorists see the solution to the problem of involuntary unemployment as being far simpler. In modern monetary theory models, there is always a level of government fiscal deficit which is consistent with full employment. They propose that the fiscal deficit (BD) is set at whatever level that leads to full employment.

By now, I have explained that the complexity of an economy moving through historical time makes fiscal fine tuning unlikely to succeed. Neither Michal Kalecki nor Hyman Minsky believed that 'pump priming', or using tax policies and other incentives, to encourage higher private investment, would deliver sustained and non-inflationary full employment. Kalecki stressed the political barriers to full employment, whereas Minsky stressed the problems of uncertainty, inflation and financial instability.

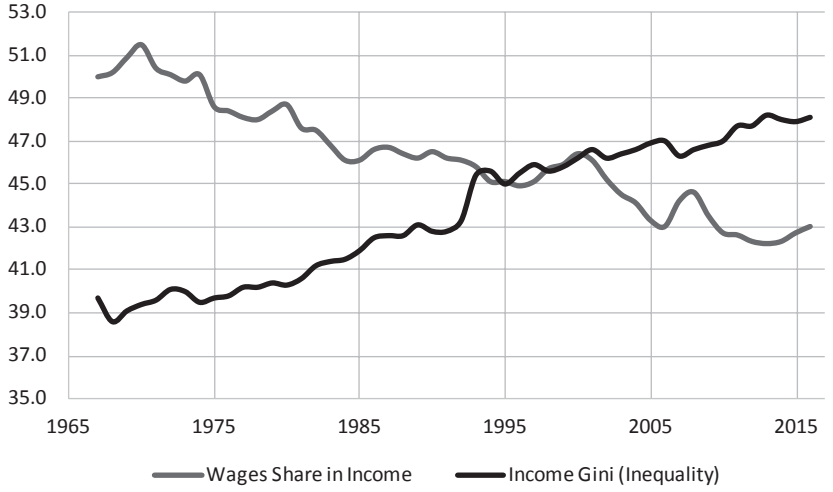

Fig. 3.4 Percentage share of wages in US Gross Domestic Income, and US inequality; 1967–2016 (*Source* Federal Reserve Economic Data. Federal Reserve Bank of St. Louis)

In modern monetary theory, the existence of a government-funded job guarantee allows for a bottom-up approach to fiscal policy, where the level of the government budget automatically moves to whatever level is required to deliver full employment. Full employment under such a system then provides a basis for improvements in the distribution of income and wealth over time. This job guarantee can reduce the impact of uncertainty and insecurity on people's well-being; can act as an effective instability thwarting mechanism; and can play an important role over time in the reduction of income inequality.

Before getting on to modern monetary theory, however, I want to discuss insights relevant to a new 'hard' economics provided by psychologists and behavioural economists. Their work provides guidance on how real people make decisions and how they develop feelings of subjective well-being. Both these issues should be of central importance in economic management, and neither has ever been adequately addressed in orthodox macroeconomic models.

Notes

1. Keynes generally made no distinction between neoclassical economics and classical economics, despite the changes of emphasis and methodology which were the result of the neoclassical revolution of the late nineteenth century.
2. As explained in his fascinating 'Keynes, Einstein, and Scientific Revolution', in the Winter 1994 issue of *The American Prospect*.
3. The Cambridge Capital Controversies were explained with great clarity by Geoffrey Harcourt (1969).
4. Keynes' response to Dunlop and Tarshis can be found in his 1939 paper in *The Economic Journal*.
5. As in Pigou (1933).
6. There has been some controversy about whether Paul Davidson uses the term 'ergodic' in a precisely appropriate manner, but in my opinion, this is not a significant issue.
7. Knight's work on risk and uncertainty, and Keynes' philosophical work on probability, were both published in 1921.
8. In the very first paragraph of his *Decision, Order and Time*, first published in 1961.
9. Hicks (1979).
10. Minsky (1975, 57).
11. Harrod (1966, 654).

12. This is in a footnote on page 167 of *The General Theory*.
13. Minsky (1975, 60).
14. Minsky (1982, 90).
15. Minsky (1975, 55).
16. Minsky(1975, 107).
17. Minsky (1996).
18. The argument that Keynes was the first behavioural economist is made in Davidson 2010.
19. This includes the Post-Keynesian economist, Thomas Palley (2010).
20. Wray's *Why Minsky Matters* provides a comprehensive and accessible summary of the evolution and the significance of Hyman Minsky's work.

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CHAPTER 4

Behavioural Foundations

All economics has psychological foundations.[1] How could it not do so? It is supposed to be about people, and about human social institutions. In the case of modern orthodox economics, those foundations involve expected utility maximisation by a radical individualist with unlimited cognitive capacity, and sufficient information about the economic environment to never make errors which are theoretically avoidable. In other words, orthodox economists assume your behaviour is consistently that of a highly autistic superhuman, with extraordinary powers of foresight.

This is very bad psychology. It is bad, because this is obviously not an accurate description of how real people generally understand the world, react to their environment, make decisions or develop feelings of subjective well-being. It is not just that people do not generally behave this way. It is also that it would be impossible for people to behave consistently like this. It is impossible for real people to behave in a way orthodox economists define as rational. Looked at from outside the discipline, it is a bizarre way to model human behaviour.

In this chapter, I will provide a brief description of some of the historical roots of what eventually became the expected utility theory embedded into orthodox macroeconomics. These roots and connections

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can be traced from Daniel Bernoulli (in 1738), to Vilfredo Pareto (in the 1890s); and from Paul Samuelson (in 1938) to von Neumann and Morganstern (in the 1940s), to the lifetime utility maximising household with rational expectations described by the first equation of any dynamic stochastic general equilibrium model today. It is a story which has been told many times, including by Paul Glimcher (2011, 37–70).

I will then discuss some of the ways in which this equation is misleading, and the most important evidence against the orthodox theory of choice as a plausible explanation of how real people make decisions. This evidence includes three well-known paradoxes of choice—those of Maurice Allais, Daniel Ellsberg and Matthew Rabin. It is supported by a distinction made quite recently, by two psychologists called Keith Stanovich and Richard West, between System One and System Two thinking, and evidence generated in the very recent past by neuroscientists. As Matthew Rabin and Richard Thaler are quoted, by Daniel Kahneman (2011, 286), as saying, 'it is time for economists to recognise that expected utility is an ex-hypothesis'. It really should have ceased to be. It has no business sitting there in the first equation of most modern macroeconomic models.

Having established that the orthodox theory of choice is misleading, I will turn to the work of Amos Tversky and Daniel Kahneman. This includes their heuristics and biases approach to dealing with the many anomalies with the orthodox theory (Tversky and Kahneman 1974), and their later Prospect Theory (Kahneman and Tversky 1979)—a theory of choice developed as a competitor for the orthodox approach. I will explore some of the supportive evidence for, and a variety of insights provided by, reference-dependent Prospect Theory.

Finally, I will discuss work by George Loewenstein and others extending Prospect Theory (Loewenstein 2007), to make it useful as a tool for understanding the role of framing in influencing our attitudes to the well-being of both ourselves and others, and in particular to the issue of advantageous inequality. This provides a justification for a job guarantee, not only as a means for enhancing the well-being of those who would otherwise be unemployed, or in insecure employment, but also as a way of improving social cohesion and facilitating sustainable prosperity.

People as They Are Not

Decision-makers in orthodox neoclassical models generally have the following characteristics:

- They are *extreme individualists and loners*—neither motivated by genuine altruism, nor influenced by others, except through market processes.
- They have *stable preferences*—over consumption decisions, intertemporal wealth allocation decisions, labour supply decisions and portfolio allocation decisions.
- They are *aware* of these preferences.
- They are *constrained expected utility maximisers*, making choices which are always logically consistent, including between goods, between work and leisure, and over time.
- They *use information efficiently* and do not make avoidable mistakes, including when forecasting future values of relevant variables.
- They have a *correct model of the economy* in their heads which they use for the purpose of forecasting or are able to learn such a model over time.
- They have *unlimited cognitive abilities* to process and evaluate the available information.
- They know that others also conform to this definition of rationality and that those other people are aware that this is also true of themselves.[2]
- The information available allows them to behave in this way (satisfying the 'ergodic hypothesis', as explained in Chapter 3).

Herbert Simon (1986) called this very narrow definition of rational behaviour 'substantive rationality' and contrasted it with a more realistic, empirical definition which he called 'procedural rationality' (or sometimes 'bounded rationality', a term I will avoid, because it is often used by orthodox economists to mean something else). Amartya Sen is another Nobel prize winner to have criticised both this narrow and self-interested definition of rationality and the classification of other forms of behaviour as being necessarily irrational.

There are two strange things about all this. Firstly, there is little psychological or sociological research to support any of the above, and where apparently supportive work has been done in experimental economics, it involves experimental designs that few prominent academic psychologists would accept as valid. Indeed, there is an overwhelming weight of empirical evidence—both from well-designed experiments and other data—that human behaviour cannot normally approximate to this description of rationality, and generally does not do so.[3] Optimising behaviour by human decision-makers in complex situations requires those situations to exhibit a high level of stability over prolonged periods. This is because the rules of thumb, or heuristics, we employ to cope with complex decisions, can only approximate to the neoclassical concept of rationality under such circumstances.

Secondly, there is very little debate, among orthodox economists, about what it means to be rational, and what there is involves rationality becoming a tautological concept. Behaviour must conform to the economist's notion of rationality, and therefore any behaviour observed in the real world must be interpreted in such a way as to conform to the notion of rationality. Gary Becker, for example, held preferences stable and developed models based on what most people would regard as changes in consumer preferences as a change in the technologies used to satisfy some stable fundamental underlying preferences. Only an economist could see this as anything other than weird.

However, it is characteristic of the neoclassical orthodoxy that, in order to maintain core axioms, complex logical arguments are constructed, to as far as possible theoretically reconcile the real world to the core model. It is essentially deductive and unempirical. It is strange because it is usually far simpler to observe how real humans actually behave and devise a theory which is reconciled to the real world. This is what psychologists, or behavioural economists, seek to do—it is an inductive and empirical approach.

Procedural rationality defines rational behaviour very broadly, along the lines that people have reasons for what they do—behaviour is purposeful and not purely random and chaotic. This is the same definition of rationality we find in Keynes and throughout Post-Keynesian and most heterodox economics. Its breadth, or its vagueness and lack of clarity, as an orthodox economist might say, is an invitation to research what drives human behaviour in different contexts, and not to build theories based on pure logic from unquestioned axioms, or more correctly, axioms which when questioned are often shown to be invalid.

As a result of this research, we now have a considerable body of evidence that the following points are valid:

- The orthodox neoclassical definition of rationality is not the only possible definition of what it means to be rational—or alternatively, if you wish to adopt this normative definition of rational behaviour as the only possible definition of what it means to be rational, then irrationality does not mean random behaviour.
- In a complex, shifting and uncertain environment and with limited cognitive capacity, such a form of substantive rationality is unattainable.
- Human behaviour is broadly rational in another, procedural, sense, although it often appears to contradict orthodox neoclassical axioms, and thereby to generate a series of apparent anomalies or paradoxes.
- It is possible to build meaningful theories of human behaviour under both risk and uncertainty which are more consistent with empirical evidence than the neoclassical theory and which make meaningful and useful predictions.
- Macroeconomics can and should be consistent with a society of individuals forming impressions and making decisions based on a form of procedural rationality under Keynesian uncertainty.
- Such a macroeconomics will make very different predictions about the policy space for sovereign governments and the feasibility of achieving or even identifying uniquely optimal policies in a shifting and complex world. This has important implications for modern monetary theory and for political decisions and economic policy.
- Issues such as subjective well-being, relative poverty and involuntary unemployment are of greatly enhanced significance within the resulting perspective.

Neoclassical macroeconomics is unfit for purpose for a variety of reasons, some of which I have already discussed. The failure of expected utility theory as a positive model of decision-making, and the existence of at least one more successful alternative theory, means that the nature of even the very first equation in typical micro-founded orthodox models should be sufficiently problematic for us to question the purpose of reading any further through such models. Dynamic stochastic general equilibrium models fail at their first equation. Tinkering around with them is futile.

Once we are free of the blinkers imposed on us by orthodox expected utility theory, and the rational expectations hypothesis, which came later but is a logical consequence of expected utility maximising choice, we can consider the implications of issues such as problem framing, mental accounting, reference dependence and loss aversion, for economists and policy-makers.

People as They Are

In a complex and uncertain set of circumstances, decision-making can at best be consistent with a form of procedural rationality. Decision-makers who have to live with limited information and realistic cognition in a changing environment, with a continuous stream of influences and potentially useful information to deal with, and a variety of decisions to take of varying degrees of significance, complexity and duration, cannot conform to the substantive rationality of general equilibrium models. It is clear that:

- We are not, in general, extreme individualists and loners. Empathy is part of our genetic make-up, and for good reasons, but also partly culturally acquired. We are a highly social species. We are heavily influenced by others and by social norms and institutions. We make comparisons, we benchmark and we assess fairness. These ideas are hardly new and have never been shown to be insignificant. Orthodox economists can claim that they are accounted for in game theory, and by manipulating utility functions, but this does not go far enough.
- We are often unaware of our very plastic preferences. Not only do our preferences evolve, but the structure of the brain changes over time, so that preferences and decisions are path dependent. Major life events—such as a period of involuntary unemployment—can have real and permanent impacts.
- We often make decisions which appear inconsistent, intransitive and apparently suboptimal, without this being a sign of irrationality. We strive for consistency, in making decisions over time, but are often unaware we are being inconsistent. Where consistency prevails, such consistency may be arbitrary and not a reflection of underlying preferences.

- We satisfice and use heuristic rules as a guide to decision-making. There are different types of heuristic rules, but such rules are generally consistent with a form of procedural rationality. We compartmentalise decisions. We often substitute simple but less relevant questions for more complex ones.
- Even when information exists, we are unable to process that information in the manner assumed in rational expectations models, because of our cognitive limitations. Information processing capacity is limited, and the use of this capacity is effortful and costly.
- We may have a view or model of the world, or a frame for some decision, in mind, but there is every reason to have little confidence in our model. In addition, we are often aware of our ignorance.
- This ignorance is unavoidable in a world of at best highly subjective expectations and often strongly non-ergodic ones—in the sense defined by Paul Davidson.

The above describes decision-making in most modern Post-Keynesian models and forms the best set of foundations for understanding Keynes, Davidson and Minsky. It is consistent with complexity economics, institutional economics and modern monetary theory. It is a basis for hard, rather than soft, economics. It is essentially realistic. We might say it is a *positive approach*, based on what is, rather than a *normative approach*, based on what neoclassical economists argue ought to be.

It is a description of all that makes decision-making interesting and almost all that makes macroeconomic management challenging. Decision-making is not simple and generally cannot be reduced to the mathematics of constrained optimisation with simple objectives. Such decisions are G. L. S. Shackle's 'empty decisions'—the decision-making of robots—at best, an interesting logical problem to study, and one that is tractable for mathematical analysis. It is, however, an error to see such analysis as being of general relevance to real decision-making. Real decision-making is complex and creative.

An economics for real human decision-makers must incorporate norms, availability, framing affects, mental accounting, social influences and herding, and must involve scepticism about the interpretation of market prices as indicative of the social value of goods and assets. Where there are matters of ethical and moral significance at stake (e.g. equity and ecological sustainability), there is less that can be safely left to the

market and more that must be social, political decision-making. There is less that is technically and technologically determined, and more that is normative and subject to debate and to uncertainty.

Such an economics must allow for endogenously generated instability and the possibility of crisis. Most people who understand economic issues through such a lens will feel that the development of effective instability thwarting mechanisms and safety nets is of greater significance than is generally believed by those steeped in neoclassicism. These issues matter a great deal.

Two Cognitive Systems

Before outlining this argument, it is useful to introduce the distinction between system one and system two thinking. A dual-process approach to cognition has long roots in psychology, dating back at least to the late nineteenth century, but the terms 'system one' and 'system two' were first coined as recently as the year 2000, by Keith Stanovich and Richard West. The 'systems' go by a variety of other names, and some prefer to use labels such as 'intuitive thinking' and 'deliberative thinking', or 'fast thinking' and 'slow thinking', especially since they do not refer to specific neurological systems. Nonetheless, I will follow Daniel Kahneman in using these terms, which have become widely used and understood.

Most of our interactions with our environment and other people, and most of the decisions we make every day are performed using system one. This is an automatic, involuntary and effortless system, in that we consciously and unconsciously are making multiple decisions all the time, generally unaware that we are doing so. System one is always switched on and is very low maintenance.

System one has much in common with our perceptual system, but is capable of associative memory search; looking for similarities and references; using simplified heuristics to facilitate quick and easy decisions; and generating emotions, beliefs and attitudes. System one thinking will often be inconsistent with the substantive rationality postulate of orthodox economics, but this should not be interpreted as evidence of irrationality. When orthodox economists classify a failure to follow the axioms of expected utility theory as irrational behaviour, they are misusing the word 'irrational', or at least using it in a way which is not consistent with its general meaning. When you point this out to them and their reaction

is dismissive and emotional, that reaction is itself a system one response, and probably not consistent with their definition of what it means to be rational. Economists regularly assume others to behave with substantive rationality, while themselves behaving with procedural rationality.

For complex problem-solving, we can and do engage system two. When thinking through complicated issues, or when trying to understand and respond to a difficult argument, we use system two. System two can be engaged when system one immediately registers that there is no acceptable quick and easy solution to a decision problem. System two is always involved in decision-making, at least in the passive sense of monitoring decisions made by system one and intervening when there is an obvious gap between the intuitive reasoning of system one and a reasonable answer to a decision problem.

Conversely, system one is also always involved, even in the most complex and deliberative of decisions, as system two must draw on impressions, emotions, attitudes and memories generated in system one. An orthodox macroeconomist will use system two to build and apply a complicated dynamic stochastic general equilibrium model, but his confidence in the unrealistic assumptions on which that model is built and his reaction to you questioning those assumptions are rooted in system one. System one is not an optimising tool.

Psychologists often use the bat and ball question[4] to show how, and some of the reasons why, system one thinking can lead us into errors. The question goes like this—apologies if you have seen or heard this before. Suppose you are buying a bat and a ball. The bat costs $100 more than the ball. The bat and the ball cost $110 together. How much does the ball cost?

If your immediate response to that question is $10, or if you are tempted to say $10, then you are like most of the students I have ever put that question to, in a classroom setting. Instinctively, it looks like a plausible answer. It seems as though you have been asked to subtract 100 from 110. Just as with the sum 2+2, the answer to that question comes instinctively to mind, whether you want it to or not. System one provides a quick and easy answer, and your lazy system two, unless you are forewarned, does not wake up and point out the error.

Once you are aware of the error, then I am sure you can work out that the correct answer is $5. The ball costs $5, the bat costs $105, the bat costs $100 more than the ball, and between them they cost $110.

You have solved the equation $X + (X + 100) = 110$, to find $X = 5$. Not particularly hard to do, but your system one thinking, looking for a quick and easy answer, working instinctively, looking for similarities with familiar problems, might have biased you to the wrong answer.

The theory of cognition and decision-making which is taken for granted in orthodox economics requires the use of system two thinking at all times, with the possible exception of decisions taken repeatedly under identical circumstances, where no deliberation is required for maximising behaviour, and system one can be relied upon. However, in reality even when we engage system two when making a choice, or resolving a problem, the influence of system one thinking on those factors we take for granted, or the framing of the problem we have unconsciously adopted, means we are still prone to biases, errors and illusions.

All this is a superficial and incomplete description of the distinction between the intuitive and deliberative approaches to making decisions, as broadly accepted by virtually all the behavioural economists who have contributed towards the study of decision-making over the past decade and more.

What is important is the validity, or otherwise, of the following closely connected points:

- The orthodox theory of expected utility maximisation assumes that sufficient relevant evidence and sufficient cognitive capacity is always available so that deliberative system two thinking can be applied to every decision problem.
- It also assumes that system two analysis will always conform to a specific set axioms, to be discussed below, and to the characteristics of rational decision-making outlined above using those axioms.
- It ignores the existence of intuitive system one thought processes or classifies them as irrational and irrelevant to economic analysis (or possibly incapable of being analysed).
- It therefore ignores the approach to perceiving and reacting to most stimuli and choice problems which is pervasive in human behaviour.
- It also ignores the extent to which deliberative thought is influenced by perceptions and intuitions, so that even deliberative decisions will often not lead to the fulfilment of neoclassical postulates regarding rationality.

- It ignores complexity and fundamental uncertainty and the fact that the human brain has evolved to maximise evolutionary fitness in a challenging but locally familiar and in some senses relatively stable environment, but now must react to a highly complex and rapidly evolving one.

Utility Theory

If we are to reject the orthodox theory of substantive rationality, or at least to amend it, we must first examine where it came from; appreciate the insights it may have provided, and the contributions of generations of economists to its development and refinement; and describe the main axioms on which it rests. We will then be in a position to describe the best available theory of procedural rationality; to show it to be a superior 'hard' scientific theory; and to describe some of the many insights it provides, and its implications for economics more generally, and for economic policy-making.

The historical roots of expected utility theory as a theory of decision-making stretch back beyond not only orthodox neoclassicism itself, but beyond the inception of classical political economy—beyond even Adam Smith. It goes back at least to the seventeenth-century mathematician, Blaise Pascal.[5] He began the development of probability theory and introduced the notion of expected value. He argued that decision-makers ought to choose between risky alternatives, or lotteries, on the basis of their maximum expected value, where expected value is defined as the sum of the possible pay-offs, weighted by their respective probabilities. According to Pascal, if you are faced with a choice between two lotteries, *A* and *B*, where *A* provides a 10% chance of winning \$1000 and a 90% chance of winning nothing and *B* provides a 45% chance of winning \$200 and a 55% chance of winning nothing, you should choose lottery *A*. This is because the expected value of lottery *A* is \$100 $(0.10 \times \$1000)$, while that of lottery *B* is only \$90 $(0.45 \times \$200)$.

The concept of expected value was a big step forward and a foundation for the later development of theories of rational choice under risk. Following Pascal, there now existed a normative theory of choice, which could be applied to analyse decisions taking under probabilistic conditions and to identify the correct 'rational' decisions to take. It could,

therefore, be used to classify other choices as incorrect and in some sense as 'irrational'. There was something missing in Pascal's analysis, however.

Pascal did not provide any notion of risk or risk aversion, or indeed a well-defined concept of 'utility' and an associated utility function. The addition of these concepts is in itself almost enough to describe modern expected utility theory, and once again it was a development which happened very early on. Adam Smith was at least alive by this point, but he was not yet an adult, and *The Wealth of Nations* was still decades away. Although challenged and modified, this theory has been left essentially undisturbed in 'state of the art' neoclassical economics to the present day. It is astonishing that the economic theory of decision-making under risk has changed so little. Indeed, like so much else in the neoclassical core, its evolution has been almost entirely circular.

This advance came early in the eighteenth century, from Daniel Bernoulli, who began his famous 1738 paper by explaining that a lottery ticket might be worth more to a rich man than to a 'very poor fellow', because the marginal utility of wealth and therefore the level of risk aversion is lower for the rich man. For this reason, 'all men cannot use the same rule to evaluate the gamble'. The rich man would be in a better position to take a risk. The poor man would be more likely to choose a safe pay-off, even at the expense of a far lower expected return.

Bernoulli[6] hypothesised that utility is a nonlinear function of wealth, with a diminishing marginal utility of wealth, so that an increase in wealth always increases utility, but at a diminishing rate. A dollar won or lost has a much bigger impact on the well-being of the poor than it does on the rich. The mathematical form chosen by Bernoulli for this function was the simplest possible logarithmic one, so that $U = \log(W)$, where U stands for utility and W for total wealth. As we will see, modern economists continue to use what is essentially Bernoulli's theory, even if they express it using a slightly more sophisticated mathematical form and locate it in a more complicated logical frame. We showed in Chapter 2 that orthodox macroeconomics had basically gone around in circles for a century between Wicksell and Woodford. It took much longer than a century to get from Bernoulli to Van Neumann and Morgenstern, but utility theory, like macroeconomics, has followed an circular path.

Bernoulli's utility function is as important an innovation of any of those elements of enlightenment thinking which laid the foundations of classical economics. It built an additional layer of complexity onto Pascal's criterion, to provide better explanations and potentially better

predictions of a wide variety of decisions, taken by rational decision-makers under conditions of calculable risk. It also established the notion that rational decision-makers should make individual decisions with reference to their total wealth, which was eventually in the 1950s and 1960s to form the basis of the modern theory of finance.[7]

However, Bernoulli's utility function could be criticised as being an arbitrary mathematical description of an unobservable and perhaps non-existent variable. It is a cardinal theory of utility, indicating that utilities depend on wealth and can be measured on some cardinal scale, using a logarithmic function. There are a variety of mathematical functions which can be used to describe a similar looking curve, including power functions, but they are also arbitrary and selected for analytical convenience, rather than because they are related to a genuinely cardinal measure of utility. No such measure of utility exists. There is no such thing as a 'util'. It makes little sense for me to claim I am happier than you, and it is absurd to claim to know by how much.

Vifredo Pareto and Leon Walras opposed the notion of cardinal utility for this reason, as being unscientific. They wanted to replace the 'soft' theory of cardinal utility with a 'hard' economic theory of welfare and choice. For Pareto, a hard theory ought to make no assumptions which were not obviously true and so include only assumptions which are genuinely 'axiomatic', or which could be demonstrated to be true. The notion of cardinal utility did not meet this criterion, and, moreover, ran the risk of being used to justify interpersonal comparisons of utility for public policy purposes, when there is no logical basis for such comparisons. How can we compare changes in your well-being to changes in mine, when we have no cardinal scale for measuring well-being? Hence, Pareto believed, it should be abandoned.

In its place, came the notion of ordinal utility. Ordinal utility makes the very limited claim that, given a choice between two sets of circumstances, a rational individual can consistently tell you which she prefers, or whether she is indifferent between them. It was this limited claim which lay behind the concepts of Pareto optimality and Pareto improvements. A distribution of resources is Pareto optimal if no redistribution could improve the welfare of at least one individual without worsening the welfare of anyone else. A Pareto improvement is when at least one individual is made better off without anyone else being made worse off. When economists discuss 'economic efficiency', they ought to be referring to Pareto optimality. When you see them talk about potential Pareto

improvements, however, it should set your alarm bells ringing. Potential Pareto improvements exist when a redistribution of income, or other resources, could in principle, if it could only be engineered, deliver a Pareto improvement. Such redistributions rarely if ever happen, so that when an economist argues that a free trade deal, for example, could lead to a potential Pareto improvement, and is therefore of social value, this should be taken with a very large pinch of salt.

Just as the Walrasian general equilibrium theory was to inspire Kenneth Arrow and Gerard Debreu, in their development of modern general equilibrium theory, so the Paretian ordinal utility theory inspired the young Paul Samuelson, in the 1930s, in the development of a modern theory of preferences (Samuelson 1938). Like Pareto, Samuelson wanted to avoid making assumptions which were not generally accepted as being true. Samuelson, in his contribution to the theory of consumer behaviour, was, like Pareto, endeavouring to do 'hard' economics, however unrealistic it might appear to us today. His revealed preference theory is the result. It is a description of the consequences of logically consistent decision-making by substantively rational and well-informed individuals.

If we imagine such a decision-maker, being faced with two possible combinations, or bundles, of goods—*A* and *B*—then the selection of *A* must imply that *B* is not preferred to *A*. *A* could be preferred to *B*, or the individual could be indifferent between *A* and *B*, but it would be irrational to select *A* if *B* was preferred to *A*. For her to obey the axiom of completeness, the individual should be able to state whether she prefers *A* to *B*, or *B* to *A*, or is indifferent between them, for every possible pair of consumption bundles. For choice to be consistent over time, this revealed preference should remain constant.

Another axiom of revealed preference is transitivity. If we extend the above example to include three consumption bundles, so that the choice is now between *A, B* and *C*, transitivity requires that if *A* is preferred to *B* and *B* is preferred to *C*, then *C* cannot be preferred to *A*. This is another required characteristic of logically consistent decision-making. Moreover, the choice between *A* and *B* should be independent of the availability of this third option *C*.

Even though real-world decision-makers are often unable to articulate preferences between choices; are often inconsistent in their decision-making without being aware of it; and have even been observed violating the axiom of transitivity and the above form of independence, revealed

preference theory became accepted in economics as a useful descriptive theory of choice, and therefore as a basis for defining rational behaviour when choices are being made under conditions of certainty and well understood.

Utility theory was now back to front. In the earlier, cardinal theory of choice, people had been described as making decisions because those decisions maximise some measure of utility, which defines their preferences. Preferences determine choice. In revealed preference theory, the options that logically consistent decision-makers select define their preferences. Choices determine preferences, at least in a relative or comparative sense. This effectively defines any set of choices as rational, by definition, as long as they are consistent. A counter-intuitive consequence is that, as long as your choices obey the axioms of revealed preference theory, you are behaving as if you are maximising some utility function, even though no measurable concept of utility actually exists. Consistent behaviour is thus defined to equate to rational behaviour—a strange definition of what it means to be rational.

The revealed preference approach can also, in principle, be applied to decisions made under conditions of risk—lotteries—by simply regarding lotteries as bundles. Thus, a lottery providing a 50% chance of a pay-off of $2000 and a 50% chance of a zero pay-off can be described as Bundle *A*; and another lottery offering a 45% chance of a pay-off of $2500 and a 55% chance of a zero pay-off can be described as Bundle *B*. If a decision-maker selects *B* over *A*, then that decision-maker has revealed that she does not prefer *A* over *B*.

However, revealed preference theory does not identify that these gambles are very similar and is consequently insufficient as a foundations for the neoclassical theory of decision-making under risk. These foundations were provided in the 1940s by the expected utility theory of John von Neumann and Oskar Morgenstern (1944), essentially through the addition of two additional axioms to those of revealed preference theory. One of these was the technical axiom of continuity of preferences, which in the case of *A* and *B* above would imply that for any such pair of lotteries, it must always be possible to reduce the pay-off to the preferred gamble by a small amount without affecting the optimal decision.

A more important and controversial axiom is that of independence, where the term independence has a different meaning to its use in the context of revealed preference above. The independence axiom is the assumption that the addition of a common and independent lottery, to each lottery, *A* and *B*, will have no effect on which lottery out of *A* and

B is preferred. If A is preferred to B, then $A + C$ must be preferred to $B + C$. It is this axiom which effectively restores Bernoulli's theory, without requiring the existence of a concept of utility which is measurable in meaningful units on a cardinal scale.

A decision-maker obeying von Neumann and Morgenstern's axioms would behave as though she had a cardinal utility function and was maximising expected utility, even though utility as a concept with meaningful and objective units does not exist. Indeed, by presenting the decision-maker with a series of hypothetical gambles and manipulating the probabilities of the pay-offs within those gambles, it would in principle be possible to identify the mathematical form of that utility function. This is based on the idea that the probabilities of outcomes must be the weights applied to the utilities of pay-offs, if decision-makers behave as expected utility maximisers.

In this way, von Neumann and Morgenstern reintroduced a form of cardinal utility into economics—albeit one which could never allow logically for meaningful interpersonal comparisons of utility. Nor, as a consequence, can it challenge the logic of Pareto's approach to questions of social welfare. It is an extraordinarily complicated way of justifying a return to what is basically Bernoulli's theory, in defiance of Pareto. It is also essential to almost all modern macroeconomics. You can't really describe it as progress, however. It is basically 'back to square one'.

Anomalies with Orthodoxy

Rationality, defined this way, requires decision-makers to maximise expected utility, where the expected utility from option j is given by the following equation:

$$\mathrm{EU}_j = \sum_{i=1}^{n} p_i U\left(x_{ij}\right), \tag{4.1}$$

where p_i is the probability of event i occurring in lottery j, $0 \leq p_i \leq 1$ and $\sum_{i=1}^{n} p_i = 1$, and x_{ij} is the pay-off should event i occur.

This implies that choices between alternative lotteries ought not to be disturbed by mathematical operations which do not reorder the expected utilities from possible outcomes. Another way of putting this is to say that the addition of a further common lottery to a pair of alternative lotteries should not cause the preferences over them to be reordered. Maurice Allais (1953) showed that this is often not the case.

For example, suppose lottery A involves a certain pay-off of \$1 million of additional wealth, while lottery B involves a 95% chance of \$2 million of additional wealth and a 5% chance of no additional wealth. It is easiest to explain with reference to the expected marginal utility from the additional wealth as follows:

$$\text{EU}\,(A) \;=\; 1.00\,U\,\big(\$1\text{m}\big),$$

$$\text{EU}\,(B) \;=\; 0.95\,U\,\big(\$1\text{m}\big).$$

If $\text{EU}(A) > \text{EU}(B)$, then lottery A is strictly preferred to lottery B. The multiplication of the probabilities of positive pay-offs by the same figure should not change which lottery offers the higher expected utility. Reversing the decision-maker's preference between A and B is only possible by violating the independence axiom, which would undermine expected utility theory as a positive theory of decision-making under risk. Multiplying the probabilities by 0.01 and denoting the resulting lotteries as A^* and B^*, the resulting expected utilities are given as follows:

$$\text{EU}\,\big(A^*\big) = 0.01\,U\big(\$1\text{m}\big),$$

$$\text{EU}\,\big(B^*\big) = 0.0095\,U(W).$$

If $\text{EU}(A) > \text{EU}(B)$, then $\text{EU}(A^*) > \text{EU}(B^*)$, because the only difference between the two lotteries is the multiplication of the probability of a positive pay-off by 0.01 in each case.

Now, by introducing a common prior lottery C, which is added to both A and B, and where C involves a 1% chance of being able to continue with whichever out of A and B has been selected, it is obvious that $A^* = (A + C)$ and $B^* = (B + C)$. Since C is common to both, the addition of this common additional lottery, or common ratio, should not logically change a decision-maker's preferences, if that decision-maker is 'rational', in the sense of following the axioms of expected utility theory. The ordering of A and B should be independent of this common ratio. The choice of A over B should imply the choice of $A^* = (A + C)$ over $B^* = (B + C)$.

Evidence that real decision-makers habitually violate the above independence axiom, by switching between A and B in examples such as the above once C is introduced (so that $A > B$, but $B^* > A^*$) was presented by Maurice Allais, almost as soon as modern expected utility theory had been devised. Violations such as this 'common ratio effect', and a related 'common consequence effect', became known as the Allais Paradox.

If faced with a choice between A and B, whether the decision is merely a thought experiment, or whether it is being undertaken for real, with significant monetary rewards at stake, the overwhelming majority of people select A. This in itself does not contradict expected utility theory and could simply imply that the majority of people are sufficiently risk averse to choose a safe pay-off of $1 million to a slightly risky pay-off of $2 million.

However, when the lotteries have been transformed as described, the majority of people reverse their preferences. Most people prefer B^* to A^*. Once again, this result on its own is entirely consistent with expected utility theory. This time the prospect of a $2 million pay-off rather than $1 million more than compensates for the additional level of risk involved.

The reversal of preferences from $A > B$ to $B^* > A^*$ is, however, a significant violation of the independence axiom, and so ought to have inspired economists to move on from expected utility theory to a replacement with greater predictive power. The good news is that a replacement exists, and that a Nobel Prize has been awarded for its discovery. The bad news, if you are a New Keynesian, is that you cannot fit it into an orthodox macroeconomic model.

Examples of the Allais' Paradox have been documented in a wide variety of contexts, and it is supported by a plethora of experimental data. It is also consistent with the way we instinctively react to such hypothetical choices—so much so, that it ought to be accepted as a fact.

An interesting version in the domain of political choice was presented by George Quattrone and Amos Tversky (1988). They offered a set of undergraduate students a hypothetical choice between two potential programmes for saving energy costs:

Policy	*Savings in energy expenditure*
Program X	$20 million savings with certainty
Program Y	80% chance of $30 million savings; 20% chance of no savings

They also offered the same students, with the ordering of the scenarios appropriately shuffled, the choice between two further potential energy saving programs in the state of Gamma:

Policy	*Savings in energy expenditure*
Program *A*	25% chance of $20 million savings; 75% chance of no savings
Program *B*	20% chance of $30 million savings; 80% chance of no savings

Given that *A* and *B* involve the multiplication of the positive outcomes from *X* and *Y* by the common ratio of 0.25, expected utility theory requires the preference for *X* over *Y* to imply a preference for *A* over *B*. Yet the combination (*X*, *B*) was the most common combination, with almost 73% of respondents choosing *X* over *Y*, and more than 61% choosing *B* over *A*.

These results were inconsistent with expected utility theory at any reasonable level of statistical significance. They were, of course, based on hypothetical rather than real choices. However, as we shall see, a shift from hypothetical or abstract decisions under risk, to real-world decisions, despite changing the nature of the Allais Paradox, does not do so in a way which lends support to expected utility theory.

Understanding the Allais Paradox requires an understanding of a variety of stylised facts about decision-making by real human beings, which ought not to have been ignored by economists and policy-makers.

The first is the importance of certainty and impossibility—what Daniel Kahneman and Amos Tversky called 'the certainty effect'. There is something different and special about probabilities of 1 and 0, particularly where decisions with significant potential pay-offs are concerned. It is easy to state that there must be an evolutionary basis for this, although this is impossible to prove conclusively. Humans evolved and survived in a world of uncertainty, having only in recent times become familiar with quantifiable probabilities. Therefore, even when given such probabilities, and even when decision-makers are well-trained mathematicians, statisticians or economists, they do not always use those probabilities as decision weights when evaluating the outcomes from a lottery.

The Allais Paradox is probably the best-known deficiency of expected utility theory as a descriptive theory of choice under risk. The prevailing reaction of most economists at the time the Allais Paradox was first discussed, and for most of the time since, has been to ignore it, and to

classify any deviation from the independence axiom, or the other axioms of expected utility theory, as inconsistent with rational behaviour, and unacceptable in a well-founded economic model of choice.

Another paradox, which is almost as well known as that of Allais, just as significant, and more easily linked to Keynes, was first explained by Daniel Ellsberg in the early 1960s. This is the same Ellsberg of the famous Pentagon Papers, who is the author of *The Doomsday Machine: Confessions of a Nuclear War Planner*. While not attacking a specific axiom within expected utility theory, the Ellsberg Paradox is related to the issue of fundamental uncertainty; undermines any subjective version of expected utility theory; and introduces the notion of ambiguity aversion to the economics of decision-making.

Ellsberg's paradox is usually explained with reference to a game where decision-makers face a choice similar to drawing a single ball from one of two urns—*A* or *B*. In urn *A*, there are 50 red balls, 25 blue balls and 25 yellow balls. In urn *B*, there are 50 red balls, and another 50, of which an indeterminate number are blue and the remainder yellow.

If a decision-maker is offered the opportunity to draw a blue ball from either of the urns, for a prize of $100, then in the overwhelming majority of cases, she chooses urn *A*. Indeed, this often remains the case even when a higher prize is offered, should the decision-maker choose to select from urn *B*. For such choices to be consistent with expected utility theory, it must be the case that the decision-maker believes there to be fewer than 25 blue balls (and therefore more than 25 yellow balls) in urn *B*.

However, if without drawing a ball the gamble is changed, so that the decision-maker is now offered the prize if a yellow ball is drawn, the decision-maker still generally opts for urn *A*, again even if the prize for making a correct selection from urn *B* is greater. For this to be consistent with expected utility theory, the decision-maker would have to believe that there are fewer than 25 yellow balls (and therefore more than 25 blue balls) in urn *B*.

These implied beliefs are not consistent with each other, and consequently, the decisions made are inconsistent with expected utility theory. Were we to apply the principle of insufficient reason and to estimate the probability of a blue ball and a yellow ball to be, respectively, 0.25 and 0.25 in urn *B*, then when the prize for selections from urn *B* was raised above the $100 prize associated with urn *A*, the decision-maker should always opt for urn *B*.

The great majority of decision-makers, faced with choices at least partly sharing the characteristics of this simplified example, will select the equivalent to urn *A*—even when expected pay-offs are equal, or where the expected pay-off to urn *B* is somewhat higher. This is inconsistent with expected utility theory, which specifies that only the utility of possible pay-offs and their probabilities should matter. It is, however, consistent with ambiguity aversion.

It is also consistent with the approach taken to subjective probability by Keynes, both in his 1921 work, *A Treatise on Probability*, and his later writing, which I mentioned in the previous chapter. For Keynes, decisions taken under subjective risk depend not only on potential pay-offs and subjective probabilities, but also on the weight of evidence indicating the reliability of those estimated probabilities. The more confidence a decision-maker has in the subjective probabilities on which a decision is based, the greater the weight given to the associated outcomes. Hence, new information which might lead a decision-maker to revise downwards his best estimate of the probability of a positive pay-off from a decision, but which at the same time increases his confidence in the validity of that estimate of probability, can increase the chance that the decision-maker will choose to go ahead with a risky gamble.

Further research has shown that the source of uncertainty is also an important factor in determining whether a decision-maker is prepared to take on a gamble, when objective probabilities are unknowable. Specifically, we are readier to gamble when we feel confident that we understand the factors determining the odds of success. This 'competency hypothesis' is supported by evidence that people are generally more prepared to gamble on an uncertain positive outcome in an area where they imagine they enjoy expertise and assess a subjective probability, than on a genuinely risky positive outcome where the objective probability of a positive pay-off is set at the same level. There is no room in subjective expected utility theory for ambiguity aversion, source dependence or a competency hypothesis of this form.

Another failure of expected utility theory was identified as recently as the year 2000, by Matthew Rabin. The Rabin Paradox is simpler than those of Allais and Ellsberg, and yet more devastating for expected utility theory. Rabin's paradox is the observation that decision-makers regularly exhibit risk aversion over sums which are so small, relative to their total wealth, as to imply an implausibly high degree of risk aversion. Expected

utility theory implies that decision-makers with wealth measured in hundreds of thousands or millions of dollars should be virtually risk-neutral in gambles which amount to just a few hundred dollars—for the same reason that arcs drawn between two points on vanishingly small segments of a continuous curvilinear function tend towards a linear tangent. In other words, where small gambles are involved, we should be back to Pascal's criterion. Only expected value should matter—risk should be irrelevant.

Rabin showed that expected utility maximisers who always turn down 50-50 lose-$100-or-gain-$110 bets will, according to expected utility theory, turn down 50-50 bets in which they lose $1000 or gain any sum of money. This is true for all utility functions with a positive but diminishing marginal utility of wealth. It is simply a consequence of the fact that risk aversion over small gambles requires a very rapidly diminishing marginal utility of wealth.

The logical consequence is stated by Rabin as follows—'This algebra shows that any attempt to explain attitudes to modest risk aversion in terms of the utility of lifetime wealth would imply a paralysing aversion to risks that everyone finds extremely attractive. It appears safe to conclude that aversion to modest-stakes risk has nothing to do with the diminishing marginal utility of wealth'.[8]

As Rabin says, to turn down a 50:50 bet of $1000 versus an infinite amount of money, which clearly has an infinite expected monetary payoff is such a decision that 'even a *lousy* lawyer could have you declared legally insane for turning down *this* bet'. And yet, it is not commonly seen as insane to turn down an even bet of $100 versus $110. Either it should be, or Rabin has identified with some simple and impeccable algebra, which I have not reproduced here for reasons of space, another reason why expected utility theory cannot be accepted as the final word in the theory of decision-making under risk.

Moving beyond these three paradoxes, a further well-known problem with expected utility theory arises when attempts are made to explain why the same decision-maker in different contexts exhibits behaviour which is often risk averse, but occasionally risk seeking. Perhaps you pay an insurance premium the same day you buy a lottery ticket—if so, you are acting as a risk averter and a risk seeker at the same time. A rich person might lose many thousands of dollars at a casino, while at the same time looking for a significant risk premium before moving out of safe government securities and into risky corporate stocks. That person is also

combining risk aversion with a love of risk. It is difficult to explain such behaviours as being consistent with orthodox expected utility theory, and impossible to do so without engaging in absurd logical contortionism. However, labelling such behaviour as irrational isn't good enough. Any 'hard' or 'positive' descriptive theory of decision-making and of subjective well-being must provide a plausible explanation such behaviour.

It is well known that decision-makers almost always exhibit risk aversion when dealing with situations relating to objectively risky gains in wealth, where those gains have a significant probability. This appears consistent with the classical pattern of risk averse behaviour associated with Bernoulli's, and von Neumann and Morgenstern's, utility functions and is written into the modern theory of finance.

Decision-makers are also apparently risk averse when insuring against low probability losses and are prepared to pay a premium which decreases their expected pay-off to avoid a small probability of a much greater loss. The 'insurance principle', based on the 'law of the average covariance', which states that many, small uncorrelated risks can be diversified away, allows for a profitable industry to profit from such premiums. Consistently risk-averse behaviour is, of course, consistent with expected utility theory—neither risk premiums on financial markets, nor the payment of premiums on insurance policies, contradicts the axioms of expected utility theory in any way.

However, it is also known that many of the same decision-makers exhibit an apparent risk preference when gains have a low but positive probability—particularly in circumstances when it is easy to imagine such an outcome occurring, such as a lottery win or a big win at a casino. This can be put down to availability bias, or the over-weighting of events which have a low but nonzero probability by decision-makers. It can be related to the Allais Paradox.

There is also evidence that decision-makers become risk seekers when reacting to circumstances involving a high probability of loss—such as an entrepreneur taking a decision with a clearly negative expected pay-off since it offers a small likelihood of a significant gain, rather than accepting the likely failure of a business enterprise. In finance, this justifies position limits on traders, to prevent them taking greater and greater risks tin an attempt to avoid booking a known loss.

To explain this set of attitudes to decision-making under risk, it is helpful and perhaps even necessary to incorporate mental accounting, reference dependence, loss aversion and nonlinear decision weights into

a model. All of these are to be found in Prospect Theory, and all have some support in neuro-scientific research. None of them can be found in expected utility theory.

To reconcile the Rabin Paradox, all that is needed is mental accounting—so that small gambles are habitually evaluated as being separate from total household wealth—reference dependence and loss aversion. To reconcile the Ellsberg Paradox, what is required is a theory which avoids the use of subjective probabilities, independent of the level of confidence in those estimated probabilities, as decision weights. Finally, to reconcile the Allais Paradox, what is required is a theory which is consistent with the over-weighting of low probability events, and the under-weighting of higher probability events, and which is consequently also consistent with the existence of a 'certainty effect'.

Prior to the development of Prospect Theory, which incorporates the above, and can easily explain the apparently confusing mix of risk aversion and risk seeking behaviour just described, the prevailing reactions in economics to flaws in expected utility theory included the following:

- an ignorance that there are any flaws;
- an outright refusal to accept that the flaws are genuine;
- a series of defensive adjustments to accommodate particular paradoxes;
- a resort to defining rationality as equivalent to expected utility maximisation and regarding all else as chaos;
- or a statement that any such anomalies are of no practical importance.

This partially explains the attraction of the microeconomic foundations of modern general equilibrium models, which are based on representative households who at all times practice expected utility maximisation. It helps to explain the dogmatic attitude that any model without such foundations is insufficiently micro-founded, and the consequent view that all macroeconomic analysis must be undertaken within a contemporary general equilibrium framework. I have already discussed how dynamic stochastic general equilibrium models have come to be pervasive in both theoretical and applied macroeconomics. I am now in a position to complete that discussion.

The very first equation of such models, as I have already said, is as far as anyone needs to go with them. No model which starts by assuming that a household maximises its expected lifetime utility can be taken

seriously as a basis for real-world economic analysis. The model has ruled out real people by assumption, right at the beginning. This is the 'softest' of economics, and sits well with the rest of the unrealism characteristic of real analysis.

To return to the 'hard' economics of decision-making and subjective well-being, which needs to be broadly consistent with a realistic monetary analysis of modern capitalism, we need to remind ourselves that both Pareto and Samuelson made progress in utility theory by choosing hard science over soft science. Pareto rejected a cardinal approach to utility theory as being unrealistic. Samuelson attempted to build revealed preference theory on axioms he believed to be broadly realistic descriptions of the basis on which rational individuals make decisions. Doing hard economics means accounting for real people and real institutions. It does not mean the outright rejection of model building, but the building of analytical models based on acceptable and justifiable assumptions, of the type I have already indicated—that is assumptions based on the exclusion of insignificant complexities, or the potential for the assumptions to be relaxed without significantly changing predictions, or the approximate realism of the assumptions.

The Heuristics Approach

It was not until the early 1970s that Amos Tversky and Daniel Kahneman, building on the work of Herbert Simon and others, developed what became known as the 'heuristics and biases' approach to decision-making.[9] This approach involved the identification and classification of a variety of common ways in which decision-making is observably inconsistent with neoclassical theory, while conforming to Simon's definition of procedural rationality.

Heuristics, which commonly lead to biased judgements, include:

- the availability heuristic;
- the anchoring heuristic;
- the substitution heuristic;
- the representativeness heuristic; and
- the confirmation heuristic.

Availability relates to the fact that we tend to over-weight possible outcomes which are to the front of our minds. Anchoring relates to our tendency to be influenced by meaningless information and/or extreme

values given to us, and by and the opinions of others, when making judgements under uncertainty. Substitution relates to our tendency to substitute simpler and related but essentially irrelevant questions for questions which are complex in decision-making. Although defined in a somewhat different way by Kahneman and Tversky, representativeness has often come to be used to refer to a tendency to draw inappropriate conclusions based on small samples. Confirmation bias relates to our tendency to dismiss new information which conflicts with our established preconceptions.

Thus: (1) a reluctance to fly following a recent air disaster is an example of availability bias; (2) adjusting your opinions partially towards those of someone whose views you know to be extreme is an example of anchoring bias; (3) buying shares in a company because you like the products the company sells, even when the shares may already be overvalued, is substitution bias; (4) taking a run of price rises in the property market as indicating high future returns on property investments is a form of representativeness bias; and (5) difficulty in objectively assessing a set of ideas which appear inconsistent with preconceptions is a form of confirmation bias, which is of course related to cognitive dissonance.

This accumulation of anomalies, heuristics and biases collectively form a refutation of expected utility theory. Any one of the above can potentially be explained away using some ad hoc adjustment to the theory. Collectively, however, they are lethal to it. On any reasonable interpretation of the logic of the scientific method, expected utility theory should now be seen, at best, as a tool limited to those special circumstances under which the evidence against its validity is largely irrelevant or inconsequential. It therefore needs to be replaced in most contexts in which it is employed. If there is any room left for subjective expected utility theory in economic analysis for reasons of analytical convenience, its use should be limited, and in the full awareness that it is not a realistic description of how human beings go about making decisions.

Prospect Theory

We have something better to put in its place—Prospect Theory. This is the most important contribution to be made by Kahneman and Tversky, collectively, individually, or with other co-authors, and will probably be central to the foundations of a new economics over the next century. It has unlocked the door to a rich seam of discoveries and insights, relating

to loss aversion, status quo bias and the endowment effect, apparently inconsistent risk preferences, apparent money illusion and nominal wage inflexibility downwards, perceptions of fairness and attitudes towards inequality, financial rewards and motivation, the Allais Paradox, the Rabin Paradox, availability and surprise, hedonic adaptation, and human perceptual responses to stimuli such as pain or noise. It is a major element in a developing consilience between neuroscience, psychology and economic analysis in the fields of subjective valuation and decision-making.

At the heart of all this is the importance of context, or reference dependence, in decision-making and the framing effects that this generates. Kahneman and Tversky's 1979 paper, in the *Econometrica*, which introduced the theory, should be a foundation stone for the new, hard economics. In a later paper, they identified 'five major phenomena of choice, which violate the standard (expected utility maximisation) model and set a minimal challenge that must be met by any adequate descriptive theory of choice' (Tversky and Kahneman 1992). These phenomena are

- *Framing effects.* This refers to such matters as the reference point used; whether outcomes are characterised as gains or losses (or mixed); the possible cancellation of common factors from the consideration of alternative options; the detection or non-detection of potential violations of stochastic dominance; and the search for simple heuristics when faced with complex problems determine the context in which the evaluation of potential outcomes takes place and the decision reached.
- *Nonlinear preferences.* These preferences render the Allais Paradox non-paradoxical. In expected utility theory, decision weights are considered identical to outcome probabilities, with no 'certainty' or possibility' effects, thereby rendering the effects identified by Allais as anomalous. In Prospect Theory, an S-shaped decision weighting function, which is highly nonlinear at very low and very high probabilities, accounts for the effects discovered by Allais.
- *Source dependence.* This refers to an approach to ambiguity aversion, as exemplified by the Ellsberg Paradox, and explained by the observation that the source of uncertainty is important. To wit: 'people often prefer to bet on an event in their area of competence over a matched bet, although the former probability is vague and the latter is clear'. The implications of this discussion broadly conform to the

views expressed by Keynes long ago, in the *Treatise on Probability*, that decision weights are not identical to estimated probabilities.

- *Risk seeking* in the domains of highly probable losses and low probability (but substantial) gains. The latter is an example of the 'possibility effect' for highly available but unlikely outcomes. We often prefer to take a gamble on a risk where there is some hope of avoiding a loss than to accept a certain loss, even when the expected loss from the gamble is greater.
- *Loss aversion*. This is the asymmetry between losses and gains in mixed gambles, which is at the heart of Prospect Theory. Many insights of the insights derived from it, such as status quo bias and the endowment effect. Through experience, the influence of loss aversion has long been understood by sales staff and marketing professionals, and is now finally and persuasively explained within an economy theory.

According to Prospect Theory, decision-making under risk involves: (1) an editing and framing process where we try to make sense of the decision and the alternatives available to us; (2) an assessment of the subjective values of the range of potential outcomes which might arise from each alternative course of action; and (3) a subjective decision weight which (under risk) is a nonlinear function of the probability of each potential outcome.

The major innovation is Kahneman and Tversky's, subjective value function (V), which plays the role of the utility function in expected utility theory. One important difference between the value and utility functions is that the utility function of neoclassical theory is a function of total wealth. Substantive rationality in orthodox economics therefore requires an analysis of the probability distribution of the possible outcomes from current decisions on absolute future wealth. A rational decision-maker should then calculate the utility of each possible level of wealth under the known states of nature, weight these contingent utilities by their respective probabilities and calculate expected utility on that basis. The decision which generates the highest expected utility is the rational decision, under this formula. Risk aversion is described by a diminishing marginal utility of total wealth and a resulting degree of concavity in the utility function.

In Prospect Theory, there is a form of mental accounting which is inconsistent with expected utility maximisation. Decision-makers do not habitually forecast the probability distribution of total future wealth when making current investment, or other resource allocation, decisions.

Instead, they tend to think narrowly and to compartmentalise decisions. For example, the Rabin Paradox is based on the observation that most people will turn down a 50:50 gamble where the possible outcomes are +$110 and −$110. It is virtually impossible to explain such a decision in terms of expected utility theory. However, such decisions are easily explained where:

- The decision is taken in isolation from the decision-maker's total net wealth ('mental accounting').
- Losses relative to a benchmark or reference point have a stronger psychological impact on the decision-maker than gains (a loss of $1 has a greater absolute V than a gain of $1).
- The benchmark or reference point in this decision, as in many but not all decisions, is the origin—no gain or loss in wealth.
- There is a diminishing marginal psychological effect to additional gains or losses relative to the reference point (so the value function is concave in gains V^+ but convex in losses V^-).

The value function can be described as a two-part power function, and indeed, this is the form which appears to be supported by neuro-scientific results. It can be written as follows:

$$v(x) = x^{\alpha} \text{ if } x \geq 0, \tag{4.2}$$

$$v(x) = -\lambda(-x^{\beta}) \text{ if } x < 0. \tag{4.3}$$

The first of these equations relates to gains, relative to the reference point, and the second refers to losses, where x is the deviation from the reference point; $\alpha, \beta < 1$ and λ is the coefficient of loss aversion. There is evidence that the coefficient of loss aversion at the discontinuity at the origin generally lies between 2 and 3. More generally, loss aversion simply implies $v(x) < -v(-x)$ (Fig. 4.1).

Loss aversion of this kind has been so widely demonstrated in small and large gambles, in both experiments and real-world studies, that it is no longer a genuine matter for contention, but rather an established fact.

To complete Prospect Theory, a nonlinear decision weighting function must be added to the two-part value function. This at least allows for the possibility of a form of maximising behaviour, based on the selection of alternative courses of action between prospects through maximising the weighted sum of subjective values (v) of potential outcomes (x), where decision weights (π) are a nonlinear function of probabilities (p).

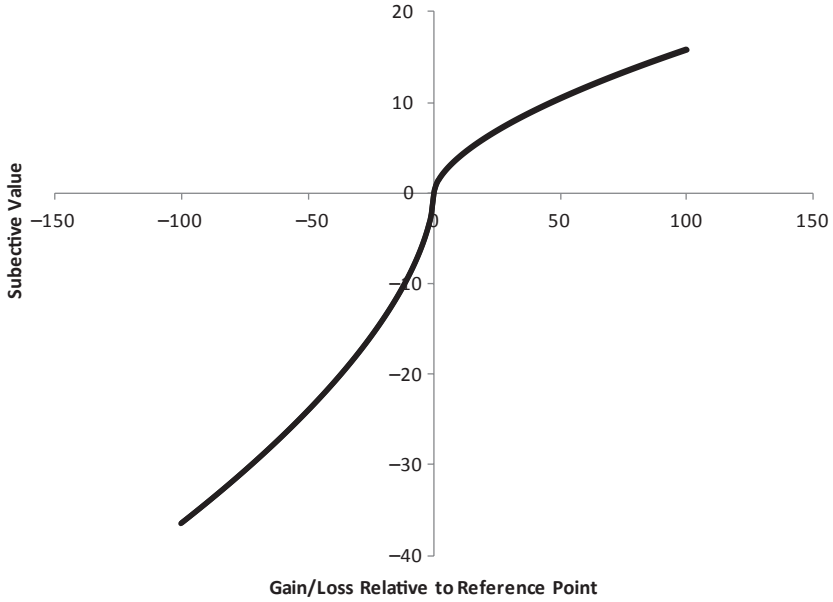

Fig. 4.1 Kahneman and Tversky's two-part subjective value function, with $\lambda = 2.3$, and $\alpha = \beta = 0.6$

It can be assumed that decision-makers try to maximise what they believe to be there expected well-being, but do so based on weighting possible outcomes in a way that does not generally reflect the best possible estimate of the probability of them actually occurring, even on those occasions where such probabilities could feasibly be estimated; and in a way which is reference dependent and exhibits severe loss aversion, so is subject to framing, and violates the axioms of expected utility theory. This would mean choosing between alternatives based on maximising V, where $v(x)$ is the value function, and $\pi(p)$ describes decision weights π as depending on, but not being equal to, the best possible estimate of the probability of an outcome occurring.

$$V = \sum \pi(p)v(x). \tag{4.4}$$

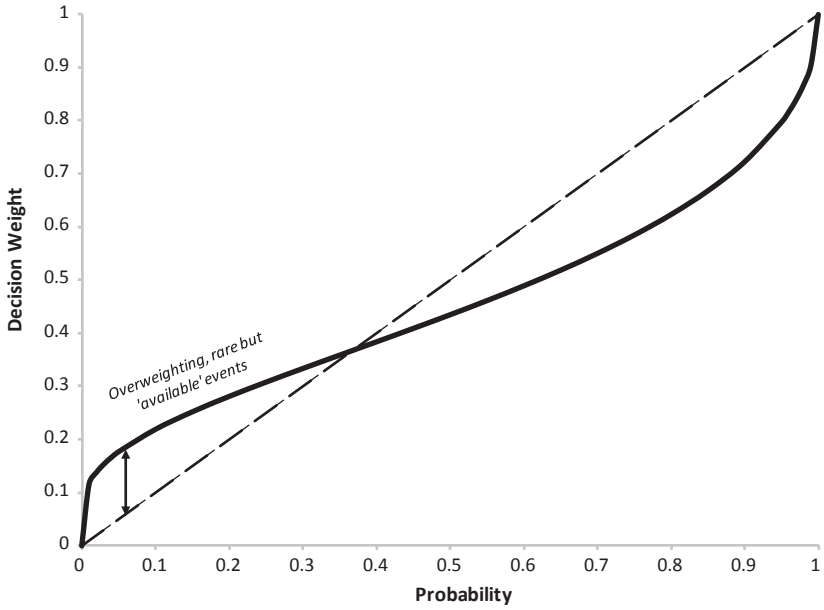

Fig. 4.2 Decision weighting function, over-weighting rare events ($\gamma = 0.5$, $\delta = 1$)

The weighting function is as shown in Fig. 4.2.

According to Prospect Theory, low probability events are either given weights which exceed their probabilities, as in Fig. 4.2, or are virtually ignored, due to a lack of 'availability' during the editing and framing process. Besides making the decision weighting function flexible enough to be difficult to refute, it has the merit of providing a logical explanation for both the over and under-weighting of low probability prospects, and the circumstances under which each will apply. The Prospect Theory literature mainly deals with abstract, or symbolically communicated, probabilities, which are highly available. Under these circumstances, events with low probabilities are over-weighted, as in the 1979 paper.

The decision weights for events with higher probabilities consequently under-weight these probabilities. The marginal sensitivity of decision weights to small changes in probability is greater than 1 at very low and very high probabilities and less than 1 across some mid-range of

probabilities. The weighting function must be concave up to some probability and then convex, and exhibits asymmetry, in the sense that the convex region is larger than the concave region.

The most widely used functional form, which I will risk including, even though it looks a little forbidding, has two parameters—one of which (γ) determines the curvature of the function; and the other of which (δ) determines the point where it intersects the diagonal ($\gamma, \delta > 0$):

$$\pi(p) = \exp\left[-\delta(-\ln p)^{\gamma}\right]. \tag{4.5}$$

It is often reasonable to assume $\delta = 1$ as an approximation, in which case the point of inflexion from concavity to convexity is also the point where the function intersects the diagonal ($\pi(p) = p$). In this case, the inflexion point occurs at $p = \frac{1}{e} = 0.368$, so that at probabilities below this value, decision weights exceed probabilities, while above it, they are under-weighted. Increasing the value of γ decreases the extent to which low probability events are over-weighted, with $\gamma = 1$ implying linear decision weights, and $\gamma > 1$ would lead to under-weighting of rare events.

Nonlinear decision weights are also apparently supported by neuro-scientific research, although evidence from neuroscience indicates that the form of nonlinearity depends on the circumstances. Decisions taken under conditions where people have the opportunity to learn from experience, but also to forget, appear, based on both the psychological and neuro-scientific research related to learning, to be better described by an opposite form of weighting function, where events which rarely occur are under-weighted, or ignored[10] ($\gamma > 1$).

This is consistent with Kahneman and Tversky's statement that rare events are either over-weighted or ignored, based on their availability, as I have suggested above, and is consequently consistent with a generalised form of Prospect Theory. The under-weighting of the likelihood of falling asset prices following a prolonged economic expansion, as Minskian financial fragility develops, and 'stability breeds instability' and there develops a 'radical suspension of disbelief', reflects this form of nonlinearity.

A nonlinear weighting function provides the most convincing theoretical explanation of the Allais Paradox. In association with a two-part value function, it provides an excellent explanation of several long-standing 'anomalies' with expected utility theory. Prospect Theory convincingly outperforms expected utility theory as a descriptive theory of choice, and for those of us who accept Herbert Simon's definition of

what it means to be rational, the normative definition of von Neumann and Morgenstern, and other orthodox theorists of choice like Leonard J. Savage and Milton Friedman, can be of only intellectual interest. The orthodox approach is dangerous as a basis for any economic model which might be used to generate policy prescriptions, or for applied economic analysis.

Reference Dependence and the Framing of Inequality

The value function referred to above applies very generally to psychological evaluations of changes in states and, as such, has provided and will continue to provide a wealth of insights. These insights can and should inform applied economics and policy formulation. For example, in 1989, in an important study, George Loewenstein and his co-authors, building on Prospect Theory, investigated how our attitudes to unequal outcomes from the resolution of interpersonal disputes depend on the way those disputes are framed.[11] The results of their research are of great importance in the framing of public debates and policy proposals relating to issues such as equal opportunities and the distribution of income and wealth. They showed, 'it is not so much *inequality* that people care about, whether advantageous or disadvantageous, but departures from *fairness*'.

Outcomes which are understood to be fair become a reference point against which potential outcomes can be evaluated. Once this is understood, personal gains and losses relative to the subjectively determined, but generally culturally influenced, fair benchmark are evaluated in a way broadly consistent with the Kahneman and Tversky value function, but with a fascinating variation that depends both on the context of any dispute and on the relationships between disputants.

There were three principal findings from the research of Loewenstein and his colleagues. The first was that people strongly dislike disadvantageous inequality. The second was that people's attitudes towards advantageous inequality depend crucially on the context. The third was that people differ in their attitudes towards advantageous inequality. The context was particularly important, with a majority of people taking a positive view of advantageous inequality in situations framed as business disputes between people with a negative relationship, but a majority taking a negative view in situations where the dispute was social and the relationship described as positive.

The researchers divided up people into 'saints', who consistently dislike advantageous inequality; 'ruthless competitors', who consistently like to get ahead of the other guy; and 'loyalists', whose attitude is context-dependent, as described above. It is important to note that it is the 'loyalists', in the middle, who determine majority votes in a democratic process. If you can frame policies, like an equitable job guarantee and other measures to reduce inequality, in such a way as to appeal to the loyalists, you will get majority support. You will win elections. You will change the world.

The implications of this research are profound, for the following reasons:

- How and to whom we compare ourselves when evaluating the outcome of an event or bargaining process governs our satisfaction or dissatisfaction. Indeed, in a variety of experiments, 'subjects were more concerned with the comparison of their own outcomes with those of the other party than they were with the value of their own outcomes'. It is therefore important to note the benchmarking to a relative reference point.
- The extent to which these comparisons are made in a social context or a business and financial context influences our evaluation—particularly of advantageous inequality. Advantageous inequality is generally seen positively in a business context, but is often (and for severe inequality generally) seen negatively in a social context. It is also seen (weakly, when in a social context) positively where negative relationships exist between the decision-maker and those against whom comparisons are made. It is seen positively regardless of the relationship setting in a business context.

  Where advantageous inequality has positive value and disadvantageous inequality negative value, the resulting value function has similar characteristics to the value function in Prospect Theory—with disadvantageous inequality having a greater psychological impact than advantageous inequality, which implies a form of relative loss aversion. Where advantageous inequality is seen negatively, the resulting value function becomes tent shaped—with the peak value at or close to the point of equality of outcome.

  It is legitimate for our purposes to simplify these results by conflating the social context and interpersonal relationship effects into one variable, governing feelings relating to unequal outcomes. We can then can compare two value functions, on the basis of different attitudes towards advantageous inequality, as in Fig. 4.3.

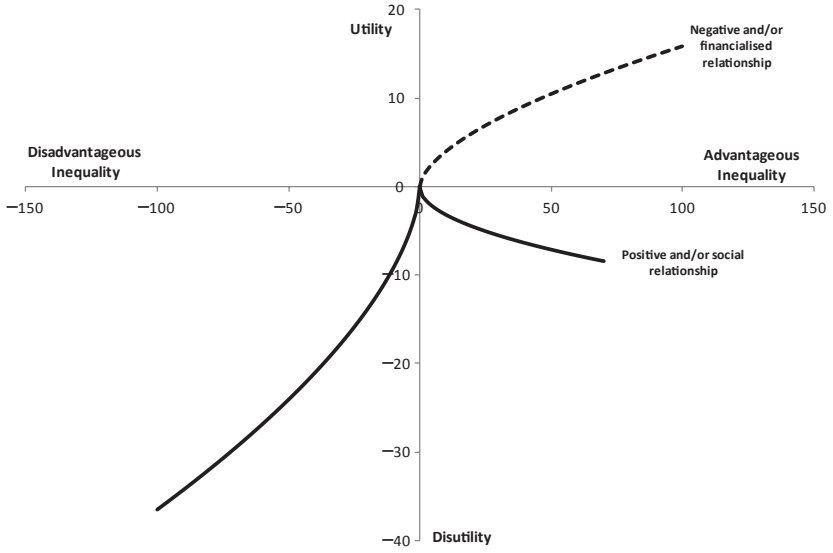

Fig. 4.3 Value functions for disadvantageous inequality; advantageous inequality (negative relationship); and advantageous inequality (positive relationship)

Loewenstein's work suggests that political outcomes and social institutions are not governed by stable social preferences, but instead that there is at best a simultaneous relationship, and that key exogenous factors shifting the determinants of institutions and attitudes over time may be interest group pressures, effective political organisations and charismatic leaders. Human nature and social attitudes towards what is fair and how to evaluate inequalities are not fixed over time, but instead are plastic. We are influenced by evolving social institutions and norms, and of course by other people.[12] This is consistent with the views of the anthropologist David Graeber, which will be discussed in Chapter 7.

There are interesting implications relating to politics, economic reform and some of the social changes which have occurred over the last 30 years. The shift towards Minsky's money manager capitalism from a mixed economy consensus during that period has financialised social relationships, and helped to shift attitudes towards the role of government and other social institutions; appropriate tax and welfare systems; and even to superannuation.

Attitudes towards inequality in old age can also be expected to be influenced by a shift away from social provision and towards private provision via financial investments. Attitudes towards inequality in socially disadvantaged groups are also susceptible to changes in the frame of reference. The more that the disadvantaged can be represented as a separate group from the remainder of us, who have contributed towards their own relative misfortune (and as such are depicted in an unfavourable light), the more likely attitudes in the community will shift towards the Kahneman and Tversky form of value function in the domain of advantageous inequality and away from the tent-shaped value function, where advantageous inequality is, if anything, perceived negatively.

We are a long way now from the isolated lifetime expected utility maximiser of neoclassical economics, with her utility in each period depending on her own consumption and her lifetime utility being a function of her wealth and her stable preferences. We can try to include altruism in her utility function, but we won't get far by doing that—altruism itself is plastic with respect to circumstances, relationships and time. We have to start thinking of her as a social animal, with plastic and shifting preferences, influencing and influenced by other people and social institutions; all against a background of an uncertain and changing environment, and a continuing need to make decisions in this context. Among these shifting preferences and influences is her concern for the relative welfare of others, and a concern for equity. This concern for equity reflects current social norms, which have evolved over time and will continue to evolve in the future.

The economy and its institutions can be changed, but so can social attitudes, and, to a greater extent than generally imagined, human nature and subjective preferences. The evolving 'non-equilibrium' state of the economy at any point in time is surely subject to deliberate manipulation, and to the often unforeseen consequences of that manipulation. Cumulative causation and path dependence are ways of referring to the role of history in influencing today's economic structure. The 'invisible hand' of the free market would, if free markets existed, be a highly arbitrary and random force for the allocation and employment of social resources, and there is no reason to suppose that under any circumstances it would lead to outcomes which could be defined as socially optimal. But there has never been such a thing as a genuinely free market, and there have never been such things as stable preference orderings, particularly where issues relating to the well-being of others and degrees of economic inequality are concerned. Karl Polanyi, in *The Great*

Transformation (1944), and well before him, Thorstein Veblen, in *The Theory of the Leisure Class* (1899), would both have both agreed with all the above, so they are hardly new ideas. The point is that they are truths implied by the hard economics of 'people as they are', and have for many years been obscured, and crowded out of orthodox economics, by the soft economics of utility theory.

From the perspective of macroeconomic policy formation, Prospect Theory and the other advances in behavioural economics have potentially transformational implications for issues such as employment and unemployment, social attitudes and social institutions, fiscal policy and economic efficiency. They are inconsistent with orthodox models, natural rate reasoning, the foundations of dynamic stochastic general equilibrium models, the modern practice of monetary and fiscal policy, the associated forms of financial and other deregulation and government dis-involvement in the economy.

They are entirely consistent with the Post-Keynesian economics of Chapter 3, the hard monetary macroeconomics of Chapters 5 and 6, and my advocacy for a more equal and sustainable society, backed by an equitable job guarantee, in Chapter 7. By that stage in our discussion, we will have put in place the essential elements of an internally consistent and realistic alternative, progressive, sustainable framework for macroeconomic management, which I will argue should replace the orthodoxy of the past few decades.

To overturn such an entrenched and powerful set of attitudes to the appropriate way of doing economics, and generating and evaluating potential economic policies, is a forbidding task. It isn't enough for us merely to be right or to have a better model of the economy. We have to convince enough people to engage with our discourse and to overcome the misleading language and metaphors of neoclassical macroeconomics. The framing of what we have to say is almost as important as its substance. This is an issue to which I will return in Chapter 8, with reference to a paper by a cognitive linguist and a leading modern monetary theorist.

The remaining chapters leave the soft economics of utility theory and general equilibrium behind, and outline the elements of a hard economics that builds on the monetary analysis of Chapter 3 and deals with real people, and real institutions and markets. It allows for the formation of economic policies designed to provide the great majority of people with a better chance of a sustainable and secure sense of well-being and more inclusive, equitable and sustainable societies.

Notes

1. Herbert Simon described economics not supported by psychological and sociological research as a 'one-bladed scissors' (1986, 223–224).
2. 'With infinite regress', as Kenneth Arrow put it, in his 1986 paper. Arrow described the ergodic hypothesis as 'a stochastic form of perfect foresight'.
3. For a comprehensive and accessible discussion (see Kahneman 2011).
4. This was devised by Shane Frederick, now at Yale, when he was at M.I.T.
5. Probability theory emerged from a correspondence between Pascal and Fermat in 1654, relating to a hypothetical problem in gambling. The story is told in Bernstein (1996).
6. The St. Petersburg Paradox is also discussed and explained in Bernoulli's paper, having been first described by his cousin, Nicolas, 25 years earlier. The St. Petersburg Paradox relates to a game of chance, involving successive tosses of a fair coin, where: (1) the game ceases once a 'heads' is tossed and (2) the pay-off from tossing a 'heads' is doubled until a 'heads' is thrown. To use modern and convenient monetary units, rather than Bernoulli's ducats, if the coin is tossed and comes up 'heads' first time, the player wins \$2 ducat and that is the end of the game. The expected value (EV) of this outcome is clearly $\$1\ (0.5 \times \$2)$. However, if the coin comes up 'tails' on the first toss, then it is tossed again, and if a 'heads' occurs on the second toss, the player receives \$4, and this is the end of the game. The EV of this outcome is also $\$1\ (0.5 \times 0.5 \times \$4)$. Should the coin continue to come up 'tails', then the coin is tossed again, and this continues until the occurrence of a 'heads'. Because on each successive toss, the pay-off to a 'heads' is doubled, the multiplication of the probability by 0.5 is cancelled, leaving the EV of each additional prospective toss at \$1. Since the game can in principle continue indefinitely, this implies that the EV of the game to a player is infinite. According to Pascal's maximum EV criterion, a player should be prepared to pay any non-infinite sum for the right to play the game. No one, of course, would be prepared to pay more than a few dollars to take part in the St. Petersburg Game—hence the paradox. The paradox is resolved once additional wealth is described to have a sufficiently diminishing marginal utility, and the decision-maker is assumed to aim to maximise his expected utility, rather than his expected monetary wealth.
7. This is essential to modern portfolio theory, which in turn is the basis for asset pricing models such as the capital asset pricing model, and essential for the efficient markets hypothesis. It is contradicted by the widespread evidence for mental accounting, discussed below.

8. Rabin (2000, 204).
9. Tversky and Kahneman (1974), also discussed in Kahneman (2011).
10. Glimcher (2011, 385).
11. Loewenstein et al. (1989).
12. As argued down the years by Veblen, Polanyi, Duesenberry and many others.

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CHAPTER 5

Modern Monetary Theory

Modern monetary theory, as a frame for thinking about macroeconomic policy, is central to the new economics of sustainable prosperity. Though there is much in modern monetary theory that is new, it nonetheless has long historical roots, in the tradition of hard monetary analysis (for a macroeconomics text which is firmly grounded in modern monetary theory, see Mitchell et al. 2016; for a primer in modern monetary theory, see Wray 2012; for a less formal explanation, see Mosler 2010).

It was developed, in the 1990s, by Warren Mosler (1996), William Mitchell (1998), Randall Wray (1998), Stephanie Kelton (Bell 2000) and others. It builds on the work of earlier Post-Keynesian economists, including Keynes himself; on the contributions of Paul Davidson, Hyman Minsky and Michal Kalecki; and on Abba Lerner's laws of functional finance (Lerner 1943). It is also related to, and can be supported with reference to, the stock-flow consistent monetary macroeconomics of Wynne Godley, which will be discussed in Chapter 6. It is grounded in a realistic understanding of the mechanics of monetary systems; of the possible configurations of monetary institutions in a modern economy; and of the actual day-to-day operations of governments, central banks and private financial institutions under current institutional arrangements. It is directly related to the state and chartal theories of money of Georg Friedrich Knapp[1] and Alfred Mitchell-Innes.[2] It is consistent with the available anthropological and archaeological evidence relating to the fundamental nature of money, and its emergence in ancient societies.[3] It

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is also consistent with the monetary theories of Karl Marx and, in modern times, Augusto Graziani[4]; and the horizontalism of Nicholas Kaldor, Basil Moore[5] and many others. Modern monetary theorists, like these economists, reject as being works of pure fiction both the orthodox money multiplier theory of fractional reserve banking and the orthodox loanable funds view of interest rates.

According to Randall Wray, the name 'modern money theory' itself is derived from these words in Keynes' *A Treatise on Money*: 'the state, therefore, comes in first of all as the authority of law which enforces the payment of the thing which corresponds to the name or description in the contracts. But it comes in doubly when, in addition, it claims the right to determine and declare what thing corresponds to the name, and to vary its declaration from time to time—when, that is to say, it claims the right to re-edit the dictionary. This right is claimed by all modern states and has been so claimed for some four thousand years at least' (Keynes 1930, 4). By this definition, money has been 'modern' throughout monetary history.

As for Keynes and the school of thought we now know as MMT, it would be wrong to say that modern monetary theory can be found fully developed in Keynes' works, although there are statements in both the *Treatise* and *The General Theory* which anticipate modern monetary theory. Moreover, in a letter to James Meade, written in 1943, Keynes said of Abba Lerner, the father of functional finance, and so for some, if not the grandfather of modern monetary theory, at least a favourite uncle, 'His argument is impeccable. But heaven help anyone who tries to put it across'.[6] Modern monetary theory is an updated, fuller and more sophisticated, development out of Abba Lerner's laws of functional finance, and Hyman Minsky's call for an effective instability thwarting mechanism, based on fiscal policy. The difficulties of putting it across are no less severe today than they were in 1943, when that letter was written. If we are to have a second Keynesian revolution, which is more faithful to the economics of Keynes (as opposed to what became known as Keynesian economics), more resilient to attack and a basis for genuinely sustainable prosperity, they are difficulties which we must overcome.

Axioms of Modern Monetary Theory

There are three core statements, or axioms, at the heart of modern monetary theory. Once learned, they can never be forgotten, and once understood, they are self-evident. Economic analysis which ignores them, or which denies their validity, is in defiance of either the laws of accounting

or the laws of science, is incompetent and is therefore liable to be misleading. The first axiom is the statement that monetary sovereign governments face no purely financial budget constraints. This is widely misunderstood and is of vital importance. A monetary sovereign government is one with its own currency and central bank, a floating exchange rate and no significant foreign currency-denominated debt. The USA has a monetary sovereign government, and this monetary sovereignty is by no means dependent on the status of the dollar as a global reserve currency. Japan, Australia and the UK are other examples of countries with monetary sovereign, currency-issuing governments. Monetary sovereignty, thus defined, is dependent on neither reserve currency status nor a country overall being a net international creditor. Australia and the modern-day UK fulfil neither of these criteria, and yet in both cases, these countries have monetary sovereign status.

The Eurozone countries are not monetary sovereigns, as they do not have their own currencies. Governments are not fully monetary sovereign if they are committed to the defence of a fixed exchange rate, whether that is against a single foreign currency, a basket of currencies or a commodity. When the USA and the UK were on the gold standard, their governments were not monetary sovereigns. This limited the policy space available to such governments in managing their economies. It is the reason the gold standard broke down in the 1930s and the reason the Bretton Woods system failed in the early 1970s. It is also the reason for the prolonged economic slump in so many Eurozone countries in the decade since the Great Recession. Even governments with their own currencies and no commitment to a fixed exchange rate are not fully sovereign if they have significant foreign currency-denominated liabilities; or at least have limitations on their sovereignty, if, like many low- and middle-income countries, they are currently dependent on imported necessities, such as food and energy, priced in terms of foreign currency, and so are vulnerable to currency depreciation on the foreign exchange market.

Modern monetary theorists normally advise central governments which are not currently monetary sovereigns to achieve or restore that sovereignty, or where that sovereignty is compromised as described in the previous paragraph, to work to eliminate the causes of the limitations on their monetary sovereignty. In a low- or middle-income country, this might involve working towards self-sufficiency in sustainable agriculture and/or green energy, supported by a job guarantee scheme, as recommended by Fadhel Kaboub and other researchers at the Binzagr Institute for Sustainable Prosperity.[7] More generally, an acceptance of austerity,

unemployment and poverty due to a fear that a fiscal deficit might drive currency devaluation and imported cost-push inflation is not the appropriate response to those who argue modern monetary theory is inapplicable to low- and middle-income countries. Instead, policy-makers should identify whether such vulnerability is real or imagined, and to the extent it is real, work towards resolving the structural issues which are its cause. A trade deficit which is simply a reflection of the rest of the world wishing to net export to a country is not necessarily a threat. Indeed, it can be seen as a net benefit for the country, since the rest of the world is exchanging goods and services, which are costly to produce, for domestic currency, which has a zero production cost, and are thereby adding to the well-being of domestic residents, as long as full employment is maintained. Looked at this way, trade deficits benefit domestic residents, while trade surpluses are costly, as well as being unnecessary. Just as we cannot meaningfully classify any fiscal balance as good or bad out of context of the current state of the economy, the same is true of a current account, or trade, balance.

Only monetary sovereigns are in a position to guarantee sustainable prosperity, where that prosperity is based on equitable full employment, and not on private debt, or the pursuit of an unnecessary trade surplus. Only monetary sovereigns are free of purely financial constraints on their net spending. Only monetary sovereign governments are free of the need to 'get into debt' and in a position to ignore threats from credit-rating agencies and the mistaken advice of those who believe financial markets can undermine their ability to maintain full employment. Monetary sovereign governments, such as the government of Japan, cannot ever run out of their own currencies. They cannot be forced into insolvency as a result of accumulating liabilities denominated in those currencies. The very notion is absurd.[8]

Among the insights to be derived from modern monetary theory is the fact that such governments do not necessarily need to issue debt securities at all. They may choose to do so, if such securities play a useful role in their financial system. They may continue to do so, as an anachronism, continuing with a practice which may have had value in the days of a gold standard, or at least of a fixed exchange rate which had to be defended using foreign currency reserves. They may have institutional arrangements which make it appear as though the government must 'borrow' by issuing debt securities before it can net spend, even though this is misleading, and in any case, those institutional arrangements could

easily be changed. They may use government security issuance to manage liquidity on the private money market, for the management of interest rates, so that selling government bonds is an act of monetary policy, rather than of fiscal policy. But they do not actually need to issue treasury bonds or bills at all.

The second core statement, or axiom, of modern monetary theory, is that all economies, and all governments, face real and ecological limits relating to what can be produced and consumed, depending on the current productive capacity of the economy. It is obvious that monetary sovereign governments can cause inflation, if they choose, by spending too much themselves, or not taxing highly enough. When this happens, the total level of spending in the economy exceeds what can be produced by all the labour, skills, physical capital, technology and natural resources which are available. Occasionally, even professional economists, when attempting to criticise modern monetary theory, confuse the first and second axioms, and end up accusing modern monetary theorists of assuming that real resources are inexhaustible. We can obviously also damage and even potentially destroy our natural ecosystem if we produce too many of the wrong things, or use the wrong processes to produce what we want to consume. Ecological sustainability is not an issue which can just be swept under the carpet, and I will return to this issue in Chapters 7 and 8.

Currency-issuing governments do not need to tax us before they can spend, and once you understand the distinction between a currency issuer and the users of that currency, it becomes obvious that this is the wrong way to think about taxation. We need to obtain the government's money: they do not need to obtain ours. Why would they need their currency, which they create, from us? Until what we will describe below as the monetary base, which includes electronic reserves held by the banking system at the central bank, as well as physical currency, is spent into existence by the government, it cannot be used to pay taxes, or accumulate in the private sector as a nominally safe financial asset. The spending comes before the taxation, or the bond issuance. The macroeconomic purpose of taxation is to create space within the productive capacity of the economy to allow for government spending on public goods without total private and government spending being excessive. In other words, the reason we have to pay taxes is to limit inflation and to guarantee a sufficient demand for the government's money as 'that which is necessary to pay taxes' to support its value.

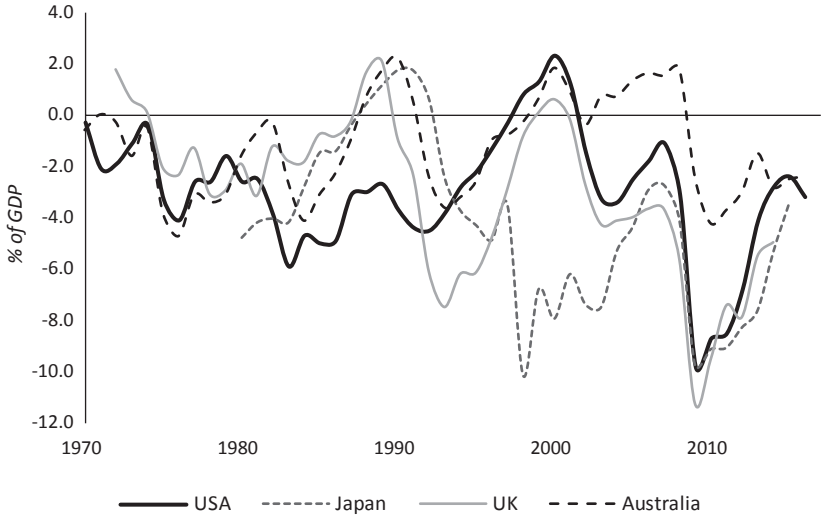

Fig. 5.1 Fiscal balances (*Sources* Federal Reserve Economic Data; Australian Bureau of Statistics; Reserve Bank of Australia)

This does not mean government spending and taxation have to equal each other, and in countries like the USA, Japan, the UK or Australia, this rarely happens in practice. Consider the fiscal balance of the USA since 1970, shown as a share of gross domestic product in Fig. 5.1. The unfortunate Clinton surplus, which helped to set up the conditions for a financial crisis, is clear enough, as is the normal requirement for the US government to run fiscal deficits.

Japan's big financial crisis hit in the early 1990s. Once again, a fiscal surplus seems an unwise goal, and fiscal deficits normal and necessary. And for the UK, apart from the Margaret Thatcher surplus in the late 1980s, you cannot help but notice the similarity with the chart for the USA. Once again, fiscal surpluses have not been associated with sustainable prosperity, but have instead been combined with rising private debt, financial fragility and eventual recession, or even major financial crisis. As we have already said, these countries have monetary sovereign governments, so that their governments are never obliged to run such surpluses. The modern monetary theory and stock-flow consistent macroeconomics of this chapter and the next explain that any specific fiscal

target taken out of context is a serious mistake, that the fiscal balance should move endogenously to meet the net savings desires of the non-government (domestic private and foreign) sectors at full employment, and that it is normal and even good for the fiscal balance to be in deficit.

It is a similar story for Australia. Once again, the fiscal surplus of the late 1980s occurred before a severe recession in the early 1990s. The surpluses of the late 1990s and early 2000s, while they did not lead to a recession, could only be sustained by a build-up in private-sector, and most notably household, debt. Australia consequently now has a household debt to GDP ratio far above that of the other countries, about double that of Japan, about 50% higher than that of the USA and close to being the world's highest. The consequence is a more fragile financial system, supported by an expensive property market, especially in the two major cities of Sydney and Melbourne. Whether there is a Minskian downturn in store for Australia, driven by a deflating property market, is something that only time can tell. Only a willingness to add a sufficiently large discretionary element to what was an endogenously emergent fiscal deficit in 2009 prevented this from happening almost a decade ago.

Balanced budget rules, or arbitrary limits on fiscal deficits along the lines of the Eurozone *Fiscal Stability Treaty*, are foolish and betray a tragic lack of understanding of the responsibilities and opportunities of a monetary sovereign government. This should be obvious to anyone familiar with Lerner's writing on functional finance, in the 1940s—let alone the body of work contributed by modern monetary theorists since the 1990s.

It leads us on nicely to the third core statement, or axiom, of modern monetary theory, which is that the government's financial deficit is everybody else's financial surplus. Since this principle is closely related to the stock-flow consistent macroeconomics of Chapter 6, I will explain it only very briefly here. For every borrower in a financial system, there must be a lender. This means that financial surpluses (lending) and financial deficits (borrowing) always cancel out, or if surpluses are recorded as+items and deficits as−items, they always sum to zero. At issue is which institution is best placed to issue the net financial liabilities that others can then hold as assets. The currency issuer, which cannot become insolvent, or currency users, for whom debt repayments are a burden which can lead to insolvency? The answer should be obvious. If governments want a secure financial system, they should want strong

private-sector balance sheets, which means the private sector will need to be able to net save, and so the monetary sovereign government will need to spend into existence the money to make that saving possible.

In an economy with a zero trade balance, if the government wants the private sector to net save over time and to develop more secure balance sheets, then the government will have to run a financial deficit. It will have to spend more currency into the private sector than it taxes out of it again, allowing the private sector to run a financial surplus. If the rest of the world wishes to accumulate net financial assets in the country (i.e. it wants to net export to the country), then the government's deficit will have to run a deficit large enough to meet both this desire and the wishes of the private sector to net save. The only way for the private sector and the government sector to both run surpluses at once is if the country as a whole is running a surplus on the current account of its balance of payments, and lending to the rest of the world. While some countries, like Norway, Singapore or Germany, can and do net export enough so that this is possible, it is obviously not possible for all countries to pursue this strategy at the same time with success. Even these countries can only do this to the extent that in other countries, governments are prepared to net spend, and/or private sectors are prepared to accumulate further debt. The world as a whole cannot be a net exporter. In the great majority of countries, for the private sector to be in surplus, the government must be in deficit. We will return to this insight in the next chapter. It is vitally important. The fact that it is not generally understood, despite the fact that most governments nonetheless do run fiscal deficits most of the time, is a testament to the strength of grip which the misleading 'government as household' metaphor has on economic discourse.

Abba Lerner's Laws of Functional Finance

The closest forerunner of modern monetary theory was, as I have stated, Abba Lerner's theory of functional finance. Lerner's view was that the government's fiscal balance should be allowed to move to whatever level is required to maintain full employment, given the current spending and portfolio decisions of the private sector. The implication is that the fiscal balance is an endogenous variable, reacting to the inevitable cyclical swings in private-sector behaviour, and alleviating the normal tendency of capitalist economies to generate insufficient effective demand for the

achievement and maintenance of tight full employment. Nobody but the government can take responsibility for maintaining the total level of spending in the economy at the full employment level.

Lerner wrote that 'The first financial responsibility of the government is to keep the total rate of spending in the country on goods and services neither greater nor less than that rate which at the current prices would buy all the goods that it is possible to produce' (1943, 39).

This is in contrast with the 'sound finance' of the pre-Keynesian Treasury view of the 1920s, which in its modern form still dominates policy thinking today, on the verge of the 2020s (!!). It is a very persistent, if innocent, fraud, indeed. Under a doveish modern interpretation of 'sound finance', a government may run a fiscal deficit during an economic recession, but ought to avoid fiscal deficits on average across the cycle, or at least to avoid structural deficits large enough to increase the ratio of government debt to GDP over time. The central bank should then set official interest rates to achieve an, explicit or implicit, inflation target and should avoid purchasing significant levels of government debt in the primary market, in order to avoid 'monetising' the government's deficit. To 'monetise' the deficit is viewed as an 'unsound' financial policy. Such was the policy consensus, at least among the great majority of orthodox neoclassical economists, of the 1990s and 2000s. It probably still is.

Implicit in sound finance is the view that 'monetising' government debt, since it adds to reserves of federal funds held in the banking system, is more inflationary than debt 'finance' via sales of government bonds to the private sector. Such a view is based on a widely held misunderstanding of how modern banking systems work, and a persistent confusion among economists and policy-makers about how monetary policy works, and about the impact it can have on credit creation, total spending and inflation.

Lerner got it right, many years ago, when he described government bond issuance as essentially a swap of one government liability for another—'The second law of Functional Finance is that the government should borrow money only if it is desirable that the public should have less money and more government bonds, for these are the effects of government borrowing'.

He rejected 'sound finance' in his two laws of functional finance, firstly by explaining that arbitrary government deficit and debt ratios are not an appropriate focus of economic policy, and secondly by

demonstrating that deficits do not need to be 'fully funded' through bond sales. Originally, Lerner was writing in an era where persistent inflation outside wartime was not anticipated. However, as inflationary pressures built up in the post-war period, partly for the sociological reasons identified by Hyman Minsky, he added a tax-based incomes policy, as advocated by Stanley Weintraub, to his proposals. Later, he shifted towards a market-based permit scheme to manage wage increases, reminiscent of the cap and trade approach for dealing with greenhouse gas emissions. The main inflation anchor in modern monetary theory is the wage paid to participants in the government's job guarantee scheme, but this does not exclude the possibility of other mechanisms being used where necessary to manage inflation.

Lerner's views on government finance are shared by modern monetary theorists. Modern monetary theory includes much more than functional finance, however, as is demonstrated in this chapter. The importance of monetary sovereignty, the relationship between fiscal and monetary policy, the limitations of monetary policy, the operations of a modern financial system, stock-flow consistency, the potential for Minskian financial instability, and the functions of a job guarantee are all essential parts of modern monetary theory.

To recap, the first axiom of modern monetary theory is that a monetary sovereign government faces no purely financial constraint. The second axiom of modern monetary theory is that all governments, whether monetary sovereigns or not, face real and ecological constraints, relating to the productive capacity of the economy. A lack of natural resources, human resources, capital resources, skills and technology limits what can be produced. Limitations on the stock of non-renewable resources and on the assimilative capacity of the environment regarding waste generated in production or consumption limits what can be sustainably produced. The second axiom does not invalidate the first one, however. What is possible, given our limited real and ecological resources can always be paid for. Money is not the issue.

MMT Basics

The simplest way to explain the essentials of modern monetary theory is within an apparently unrealistic institutional framework, with a consolidated government sector and no separate central bank, or where the central bank is just a government department. This conflation of the central

bank with the central government is sometimes objected to by critics of MMT, because it is not consistent with current institutional arrangements.[9] I accept that criticism—noting, however, firstly, that as Minsky said, institutional arrangements which are currently a barrier to the pursuit of the public purpose can always be changed; and secondly, that the axioms of modern monetary policy still apply under more complicated institutional set-ups. To put it another way, such critics have missed the point.

If we, for the moment, defy the critics and consolidate the central bank into a government sector, then there is no distinction between the balance sheet of the central bank and the central government. The following points are then rendered very clear:

- Government expenditure involves the direct creation of bank deposits and bank reserves. Governments literally spend via keystrokes, and there are no financial limitations on government spending, beyond normal budgetary processes. Government spending is 'financed' when it is authorised, purely by being authorised.
- Since there are no financial limitations on government spending, the government does not need to tax or to generate other cash flows for itself before it can spend. It has, therefore, no fiscal motivation for issuing debt securities. Government bonds and bills are unnecessary, at least from the perspective of financing government spending.
- Taxation exists not to finance government spending, but purely to modify private-sector behaviour and economic outcomes. Taxation is there primarily to limit private-sector purchasing power by reducing disposable incomes; to create room within full employment output for non-inflationary government spending; and to create sufficient demand for government money to maintain its acceptability and price stability. In addition, the conventional microeconomic functions of discouraging undesirable activities and contributing towards a socially acceptable distribution of income and wealth remain valid.
- In this institutional set-up, there is no distinction between sales of government securities by the central government (which are conventionally seen to have the role of 'funding' the government deficit and avoiding its more inflationary 'monetisation') and sales of securities by the central bank (which are concerned with the

management of bank cash reserves and the maintenance of the official interest rate target). The former motivation for bond issues, as I have already stated, is not a valid one, which leaves us with bond issues being justifiable only for the purposes of interest rate maintenance on the overnight cash market. Sales of government securities in this institutional set-up can only be justified for this purpose, which makes them monetary policy operations rather than fiscal ones, and as a means of providing a safe, interest-bearing asset to fulfil the requirement for a nominally safe benchmark asset in private-sector portfolios.

- The overall size of the government relative to the private sector remains a political issue, depending on the preferences of the electorate for public goods as opposed to private goods, and on the level of taxation which is necessary to ensure that total government and private-sector spending does not exceed what is consistent with non-inflationary full employment. The fiscal balance is then free to move over the cycle, in response to automatic stabilisers and discretionary policy changes. The balance is mainly determined endogenously, by non-government-sector spending and saving behaviour (where the non-government sector includes both the domestic private sector and the rest of the world).

The absorption of the central bank into the government sector, so that it is not treated as a separate institution, purely facilitates clarity. The validity of modern monetary theory is not dependent on consolidating the central bank into the government in this way. The above claims remain true, in other words, even when the central bank exists as a separate institution from the central government, as long as the central bank is prepared to 'lend' to the central government without limit; to purchase government bonds when required in the primary market; to provide the central government with an unrestricted 'overdraft facility'; or just to purchase government bonds without limit in the secondary market, as the Bank of Japan has been doing in 2017 and 2018. Just a commitment by the central bank to never 'bounce a government cheque' is more than enough. Central banks do not 'bounce government cheques' in monetary sovereign economies.

Government net spending then generates an asset for the central bank, in the form of government securities, or a government overdraft, to match the liability of increased commercial bank reserves, and, of

course, increased bank deposits for the private sector. There remains no financial limitation on government spending. Everything else remains as before. Although it may appear to be the case that government spending is financed through taxation or bond sales, as they lead to credits on the government's balance at the central bank, which are, in an accounting sense, 'necessary' to permit government spending from this balance, this is an illusion. To fall for such an illusion is to display a lack of understanding of the monetary system.

It is an illusion because it is a misleading way of describing financial processes. In practice, the government can still spend without limit, through the use of keystrokes, and buy anything which is available for purchase in domestic currency. The existence of a separate institution called a central bank, with its own balance sheet, does not alter the fiscal space available to a monetary sovereign government (Fullwiler 2010). It is, in effect, just a convention of public finance accounting.

That such governments can, and generally do, act as though they need to raise taxes before they can pay for their spending, can be put down to ignorance or to politics. They may issue government securities, as Lerner suggested, because they think it is a worthwhile thing to do, given the role played by those securities as default risk-free financial assets for the private sector, and across the financial system. They may do so, however, for purely anachronistic reasons, or out of ignorance, of possibly for political reasons once again. If current institutional arrangements, which do not change the truth of the axioms of modern monetary theory, obscure that truth and mislead policy-makers, many economists and the general public, there is a good case for changing and simplifying those arrangements. Central banks are effectively just departments within the government, even if important decisions made within them, for example on official interest rates, are made, for good or ill, independently of elected politicians.

Fiscal Sustainability

Those economists who lack an understanding of monetary sovereignty waste a great deal of time and energy on an issue they describe as 'fiscal sustainability'. To a modern monetary theorist, fiscal sustainability requires the government to run fiscal deficits high enough to allow the non-government sector (the private sector and the rest of the world) to fulfil their net savings desires while total spending remains at the

non-inflationary, full employment level. It is sustainable, because it does not require the private sector to go into debt, and to increase the fragility of the financial system, to maintain full employment. It is consistent with strong private balance sheets and strong financial regulation. It is fiscal surpluses which are unsustainable, in economies without trade surpluses, as they drive the private sector into debt, as was the case in Australia between 1996 and 2006. This is not what orthodox economists are referring to when they discuss fiscal sustainability, however.

The orthodox approach to fiscal sustainability ignores the distinction between a currency issuer and a currency user and so ignores the issue of monetary sovereignty entirely and treats the governments of modern-day Greece and Australia, for example, as though they operate under similar monetary systems. Greece, as everyone ought to be aware, is not a monetary sovereign nation, as it is in the Eurozone: Australia has a monetary sovereign government. Ignoring the distinction between them invalidates anything else you have to say about fiscal policy. The distinction is vital. It is why Greece, remaining within the euro, was not in a position to avoid a prolonged economic depression, following the shocks of 2008–2010. Its government, as a non-monetary sovereign, unsupported by a central bank, was at the mercy, firstly of the bond market and secondly of the European Central Bank, the International Monetary Fund and its fellow members of the Eurozone. Unemployment peaked at 27.5% in 2013, having been well below 10% during the 1980s and almost the whole of the 1990s. It remains above 20% in early 2018.

The orthodox approach is rooted in a misunderstanding of the nature of money, as stated in Chapters 1 and 2, and is consequently also, even now, infected by the money multiplier fallacy, as we shall see. When misleading people about fiscal policy, as they so often do, orthodox economists start by writing down what they wrongly call a government budget constraint. It is not a constraint at all, since we know a monetary sovereign government faces no purely financial constraint. It is an identity, and one which can equally well be used to illuminate the interaction between fiscal and monetary policy from a modern monetary theory perspective, as to refer misleadingly to constraints and policy sustainability from an orthodox one.

$$G_t + r_t B_{t-1} = T_t + \Delta B_t + \Delta H_t \,. \tag{5.1}$$

G_t is government spending in year t; B_{t-1} is the value of government bonds (or, more correctly, debt securities) existing at the end of year

$t-1$; r_t is the average rate of interest on those government securities in year t; T_t is taxes collected during year t; ΔB_t is the net increase in total bonds issued to the non-government sector ('government borrowing') across year t; and ΔH_t represents any use of what is often called 'seignorage', or 'printing money' to increase the monetary base in the financial system. On the left-hand side, we have total government outlays, including the payment of interest to those who hold existing government securities. On the right-hand side, we have taxes, net bond issuance and the net issuance of currency and bank reserves. The equation is in no sense a constraint, because there is no upper limit to ΔH_t, as central bankers have demonstrated, if it ever needed demonstrating, since 2008. However, it is an accounting identity.

If we move tax receipts over to the left-hand side of the identity, we have an expression for the fiscal deficit across the year, F_t.

$$F_t = \Delta B_t + \Delta H_t \,. \tag{5.2}$$

A fiscal deficit can be accounted for through the issuance of government securities, or purely by crediting bank reserve accounts through the use of keystrokes. Given that every $1 the government spends is initially a keystroke operation, and bond issuance, when it happens, merely withdraws from the system funds which have previously been credited to bank reserve accounts, it makes sense to rearrange the equation a little more, and to put the increase in the monetary base on the left-hand side:

$$\Delta H_t \;=\; F_t - \Delta B_t \,. \tag{5.3}$$

A fiscal deficit will increase bank reserves and the monetary base unless it is offset by the sale of additional government bonds to the non-government sector. Sales of bonds by the treasury in the primary market, or by the central bank, from its balance sheet, in the secondary market, can be used to drain excess reserves from the banking system. This is one way of preventing money market interest rates being driven down below the central bank's target for the policy rate (called the federal funds rate in the USA, and a variety of other names in other countries). As we will see, it is by no means the only mechanism available to central banks in the management of interest rates.

Orthodox economists claim that significant increases in the monetary base, at least outside periods following financial crises, when banks are not lending and interest rates are close to zero, are inevitably inflationary (Fischer and Easterly 1990). Any such claim is logically dependent on the

money multiplier theory of credit creation, which has long been rejected by every major central bank, and by everyone with any experience of day-to-day central banking, as being completely unrealistic and misleading. They also claim that what they call 'money printing' has regularly been the cause of periods of hyperinflation, and often refer to the infamous episodes in Germany in 1923 and Zimbabwe in 2008 in this context.

This is to confuse cause with effect. Hyperinflations are almost always caused by an initial collapse in aggregate supply, rather than by increases in demand, which are then accommodated, and in a sense fuelled, by increased government spending. The increased government spending happens in response to an acceleration in the price level, rather than being its initial cause. Under these circumstances, it is impossible to issue bonds quickly enough to limit increases in bank reserves, and so inevitably acceleration in the monetary base will be associated with a hyperinflationary episode. It was not, however, the cause of that episode. Spending beyond the productive capacity of an economy fuels inflation. Increases in a particular measure of the money supply will not do so, unless they are the cause of such spending.

If you believe that fiscal deficits cannot be allowed to add to the monetary base, because for some reason you think a rising monetary base is especially inflationary, then you might choose to set $\Delta H_t = 0$, so that $F_t = \Delta B_t$. This feeds into the myth that monetary sovereign governments are dependent on bond markets to allow them to finance net spending, and that such finance could potentially be withheld. It apparently contradicts the first axiom of modern monetary theory. It is highly misleading. It might be done innocently, but it is definitely fraudulent.

One way in which it misleads is by drawing an unjustified distinction between bank reserves held at the central bank (which are part of H) and government securities (B). Both are government liabilities, at least when the central bank is consolidated into the government sector. In recent years, central banks have started to pay interest on bank reserves, so they are both interest-bearing government liabilities, when viewed correctly. Since quantitative easing generally involves the exchange by a central bank of newly created bank reserves for existing government securities, it is no wonder that such an activity has little or no impact on total spending in the economy or on inflation. It is just an asset swap, and moreover a swap of two very similar assets. Government bonds are effectively just marketable time deposits at the central bank. Bank reserves are sight deposits at the central bank. There is no reason for government deficit spending to be any more inflationary when the resulting increase in bank

reserves, and so in H, is not offset through sales of government bonds, than when bond issuance is used to drain those newly created reserves. Given the recent arrangements for maintaining official interest rates in most high income countries, which will be described below, increasing bank reserves does not even have any implications for official interest rates. It is much ado about virtually nothing.

We have not yet dealt fully with the orthodox story of fiscal sustainability. Orthodox economists and commentators often talk of a growing government debt 'burden', and the supposed risk that the ratio of government debt to GDP, which is taken to be the most sensible measure of that burden, might rise explosively over time, leading to government insolvency, or if not that, inflationary 'money printing'. Even using their own logic, they are being alarmist, when they write in these terms. The mathematics tells a somewhat different story.

In the following equation, def_t is the primary deficit, or $G_t - T_t$, excluding interest payments, as a proportion of GDP across year t; r_t is the average real rate of interest paid across the year on government debt; g_t is the growth rate in real GDP; m_t is the ratio of reserve creation (or the rate of increase in the monetary base due to fiscal policy) relative to GDP; and d_t and d_{t-1} are the debt to GDP ratios at the beginning and end of year t.

$$d_t = \text{def}_t + \frac{(1 + r_t)}{(1 + g_t)} d_{t-1} - m_t . \tag{5.4}$$

If we exclude outright monetary financing, to humour orthodox economists, so that $m_t = 0$, then the equation becomes

$$d_t = \text{def}_t + \frac{(1 + r_t)}{(1 + g_t)} d_{t-1} . \tag{5.5}$$

We can derive an expression for the level of the primary deficit which is consistent with a stable debt to GDP ratio, and so obviously non-explosive, by setting $d_t = d_{t-1}$. The result is

$$\text{def}_t = \frac{(g_t - r_t)}{(1 + g_t)} d_{t-1} . \tag{5.6}$$

For example, given a debt to GDP ratio of 80%, GDP growth of 5% and a real interest rate on government debt of 3%, a government could continue to run a primary fiscal deficit of 1.6% of GDP, without any increase in the debt to GDP ratio over time. Interest payments on government

debt would be steady at 2.4% of GDP, so that the overall fiscal deficit would remain under these circumstances at 4% of GDP. Despite there never being a fiscal surplus, the ratio of government debt to GDP would not rise over time.

The orthodox response to this arithmetic is to point out that it depends on the growth rate of real GDP being above the real rate of interest on government debt. This apparently implies a condition for an exploding debt to GDP ratio, of $r>g$. Firstly, it is important to remember that this is irrelevant for a monetary sovereign government, which doesn't need to issue bonds in the first place and in the second place has a central bank which can intervene in the bond market to set r at any level it chooses, just as the Bank of Japan has been doing in 2016–2018. Secondly, it is oversimplistic, even when ignoring this. The condition $r>g$ would imply an exploding debt to GDP ratio only if primary fiscal surpluses were ruled out by assumption. Otherwise, the primary fiscal surplus consistent with a stable debt to GDP ratio would simply be

$$\text{surp}_t = \frac{(r_t - g_t)}{(1 + g_t)} d_{t-1}\,. \tag{5.7}$$

As I have said though, for a monetary sovereign government, this is not a relevant issue. It is of possible relevance for non-monetary sovereigns, like the governments of individual Eurozone countries. However, in 2012, when the Eurozone was on the brink of collapse, even they were rescued from skyrocketing interest rates on their debt, simply as a result of the European Central Bank declaring itself willing to buy that debt on the secondary market.[10] It was not even necessary for the ECB to follow through on this promise. Just the promise was enough. The yield to maturity on long-term Portuguese government bonds, which was above 10% before this commitment, fell towards 2% subsequently. Central bankers, remember, have limitless pockets. They cannot be dictated to by bond markets, even if they might sometimes pretend that the truth is otherwise.

Statements like the following one, which was written by a leading macroeconomist and founder of New Keynesian economics, who went on to become the Vice-Chairman of the Federal Reserve, look absurd, when you understand how monetary systems work. I cannot do otherwise than have an amazed reaction to Stanley Fischer having written this, in 1990, and to wonder whether he believes it still. It is plain wrong, for the most basic and fundamental of reasons.

'At some point it will be impossible for the government to sell its debt, and the process will have to be brought to an end by cutting the budget deficit. The point at which the process has to end depends on the expectations of the public. When the public recognises the unsustainability of the government's fiscal policy, it will cease buying government debt and thereby force a change in policy'.[11]

A monetary sovereign government does not need the public to buy its debt at all. Nobody can force a change in fiscal policy on such a government by threatening not to buy its debt securities, even if the government chooses to pretend otherwise. It does not have a compelling need to sell such securities in the first place. It does not need to get its currency from us. It cooperates with its central bank in the issuance of the currency. It cannot run out of its own currency, unless it chooses to do so. The central bank can set the interest rate, or yield, on long-term government securities, should it choose to do so. The decreasing yield to maturity on long-term Japanese government debt down the years, as gross government debt has gone from below 70% of GDP to a world record level of 250% of GDP, makes the point conclusively. The government with the most debt in the world, relative to the size of its economy, has an interest rate on its debt of approximately 0%.

All this is obvious, if you understand that official interest rates can be held permanently at zero, with fiscal policy used to manage total spending, and financial regulation used to limit and influence the direction of private credit creation. It remains true that the government does not need to issue debt, however, even if you wish to maintain positive default risk-free interest rates across the term structure. It simply requires the replacement of government debt securities with term deposits at the central bank. These are of course functionally identical liabilities for the consolidated government sector, but would be less likely to be seen as 'government debt' and more likely to be described as a form of broad 'money'. This simple reform would do much to correct the misleading discourse generated by orthodox macroeconomists and commentators about government debt and so-called fiscal sustainability.

Orthodox economists can be divided up into fiscal doves—I have already talked of a doveish approach to 'sound finance'—and fiscal hawks, just as they can be divided into various forms of neoclassical synthesis 'Keynesians' and various types of monetarists. Fiscal hawks believe governments should never run fiscal deficits, except perhaps in wartime,

and recommend balanced budget legislation, or some similar limitations on the government's fiscal space. They often cling to Barro-Ricardian equivalence, which we have already rejected as absurd. Their approach to fiscal policy is unwise, liable to be pro-cyclical, and eventually to have catastrophic consequences. Fiscal doves, on the other hand, believe governments should run deficits during and after economic downturns, but balance them out with surpluses during periods of strong growth. They often argue that the fiscal balance should be zero on average across the economic cycle, or at least that they should only borrow for investment purposes, like a business, and not for what is classified as government consumption. Their views are in conflict both with historical experience, as we have seen, and with the mathematics I have just gone through. What they say sounds plausible, but it makes no sense. They may do less damage than fiscal hawks, but they still have the wrong frame for thinking about fiscal policy.

Stephanie Kelton has chosen another bird for modern monetary theorists—labelling them fiscal owls. Owls are of course famously associated with wisdom. Moreover, they can find their way in the dark, and there has been a lot of darkness, as opposed to light, being thrown on the appropriate role for fiscal policy by orthodox economists, of both the hawk and the dove varieties. A deficit owl knows that the appropriate role for fiscal policy is not ever to 'balance the budget', but to balance the economy. There should be no target for the fiscal balance, other than for it to be at the correct level to allow for genuinely sustainable, equitable full employment. Sustainability here means taking into account real constraints and associated inflation risks, and ecological constraints, and in that sense the interests of future generations. The fiscal balance, taken out of context, cannot be interpreted as good or bad. There will be occasions when the deficit should be 3% of GDP, and occasions when it ought to be 10% of GDP.[12] There will be occasions when it is appropriate to run a fiscal surplus. The fiscal balance should be what it needs to be to allow for non-inflationary full employment and sustainable prosperity. Both appropriate theory and historical data tell us that fiscal deficits are normal and usually necessary.

It is understandable that so many orthodox, and even some heterodox, economists, get the concept of fiscal sustainability so badly wrong. Their logic is based on the metaphor of the government as a household, and of course, it echoes the inescapable budgetary truths which apply to

all decision-making units other than monetary sovereign governments. Every other economic unit faces a potentially binding intertemporal financial budget constraint, ignoring for the moment the option of bankruptcy. Every other economic unit must earn income, benefit from capital gains, run down assets or run up debts (or financial liabilities), in order to finance spending, where debts must be repaid in the future. Every other actor in the economy faces insolvency risk. Only currency issuers—monetary sovereigns—are immune to that risk.

Our normal, instinctive, system one approach is to imagine parallels between non-sovereign and sovereign budgets, and terms such as 'budget deficit' (which implies a shortfall or deficiency) and 'government debt' (which implies something burdensome, and in a sense immoral, which must be paid back) bias us to draw these inappropriate connections. It is unsurprising that politicians, journalists and even economists habitually interpret the term 'surplus' as something good, which is a sign of success akin to a company being in profit, and 'deficit' as something bad, and a sign of failure, like a corporate loss which could lead to insolvency.

However, such parallels are not valid, as we have seen. Current arrangements are a veil, hiding the truth regarding the fiscal space available to monetary sovereign governments, and mislead not only the community at large, but also, as suggested above, the majority of economists. This is vitally important, and contributing in a small way to changing this misperception was a large part of my motivation for writing this book in the first place.

Money, Banking, Reserves and the Money Multiplier Fallacy

To replace orthodox economics with an economics for sustainable prosperity, we need the right frame for thinking about fiscal policy. That frame must be based on a correct understanding of the operations of a modern monetary system. To achieve this, we need to get the origins of money and the nature of money right, and we need a correct understanding of how banking systems work. Orthodox economists still get a lot of this wrong, and some well-meaning monetary reformers also get crucial elements of it wrong. You have to get it right, or you will mislead yourself and others.

I have already said that the origins of money do not lie in a pre-monetary barter system of exchange, and the emergence from it of a form of commodity money. Instead, they lie at least partly in the emergence of early governmental institutions; in a need for such institutions to provision themselves; and consequently in taxation. Money as a unit of account was whatever was used to measure tax and other liabilities to the government, even if taxes could actually be 'paid' in a variety of ways. The first such government-determined units of value may have been weights of barley, or other commodities. The important thing is that those units were chosen by governments.

Government-created money tokens, which could be used by those who owned them to make tax and other payments to those same governments, were probably issued very early on and have existed across the whole of monetary history. Even coins containing gold or silver were really just government tokens, when they traded at a value above the market value of the metals of which they were made. Fiat money is nothing new. Fiat money, in the form of what can be regarded as IOUs issued by governments, which are really just tax credits, has existed for millennia.

Money is a social institution, apparently invented by early governments. This is Knapp's state theory of money. It is the money of modern states over at least 4000 years identified by Keynes. It is Charles Goodhart's *Theory C* (C for chartal), theory of money. It fits perfectly with the credit theory of money, as shown by Mitchell-Innes and later by Minsky. More importantly, it fits well with anthropological and archaeological evidence, according to a wide variety of sources.

Modern money is that which is necessary to pay your taxes, as well as the unit of account in which your taxes are calculated. In the USA, modern money is the US dollar. In Australia, it is the Australian dollar. In Japan, it is the yen. In early monetary societies, it was whatever unit the central authority determined it to be. As Keynes said, 'modern' states write the dictionary, where money is concerned, and set the rules.

The government and its central bank are in charge of a monetary system, which is based on financial assets and financial liabilities, or on credits and debts. As Minsky said, 'the fact that taxes need to be paid gives value to the money of the economy'. As Mitchell-Innes said, 'Money, then, is credit and nothing but credit. A's money is B's debt to him, and when B pays his debt, A's money disappears. This is the whole theory of money'.[13]

To make sense of all this, we have to distinguish between vertical (or outside, or government) money and horizontal (or inside, or private credit) money and to understand the relationship between them. This involves making a distinction between the monetary base and other official measures of the money supply, and another one between money and quasi-money. It requires us to understand that there is a hierarchy of money in a modern monetary system.

The monetary base which orthodox economists often (wrongly) label 'high powered money' (hence the label H earlier in the chapter, which I will retain here) consists of currency in circulation (C), plus private banks' reserves (R), held partly in the form of vault money (cash) and partly as sight deposits of federal funds (known as exchange settlement funds in some countries) at the central bank.

$$H = C + R. \tag{5.8}$$

This base money (H) must be either spent into existence by the monetary sovereign government or lent into existence by the central bank. In an accounting sense, it consists of financial liabilities of the central bank. Since the central bank should be consolidated into the government, we can describe base money as consisting of some of the financial liabilities of the government. In that sense, it is a form of credit, but it is a form of credit which has been issued by a monetary sovereign government, and so can only be repaid with other IOUs of that government, or used to pay taxes or make other payments to that government. It is government money. It is vertical money, in the sense that it is passed down from the government, sitting at the apex of the financial system, to the private sector. It is outside money, since it is coming from outside the private sector. When it is spent into existence by the government, rather than lent into existence by the central bank, it is an addition of net financial assets to the private sector. Government money is a financial asset for the private sector. It is not a financial liability for the private sector. Its issuance as a result of government spending does not require anyone in the private sector to carry a debt.

It is common to read that 97%, or some such proportion, of the money supply in a country has been created from nothing by private banks, and that private banks create money without limit and outside of the control, or even of the influence, of the government and its central bank. Such statements are at best partly true, in some respects completely wrong, and have the capacity to be profoundly misleading.

Official measures of the money supply (MS) include currency in circulation (C) and deposits held at private banks (D). Currency in circulation is of course a financial liability of the government, as I have just said. Deposits held by households and non-bank businesses, with banks, are financial assets of those households and non-banking businesses (and some other institutions), and financial liabilities of the banks. Both households, or businesses, and banks are part of the private sector, so that these deposits are not net financial assets for the sector as a whole. They are horizontal money, or inside money, since they are created within the private sector, rather than being passed down to the private sector by the government.

$$\text{MS} = C + D\,. \tag{5.9}$$

Bank deposits are mainly the result of banks creating credit for their customers. Monetary reformers who claim that banks create money 'out of thin air' are entirely right in this respect. Given that all money is some form of credit, and that credit (or debt, depending on which term you prefer to use) is always a contractual relationship, created out of nothing, it must be true. All money is credit, and nothing but credit, as Mitchell-Innes said, many years ago. But we need to dig a little deeper.

The following is a (very, very) highly simplified balance sheet of a private bank (Table 5.1).

You can immediately see a potential source of confusion, which often catches people out. That is the use of the word 'reserves' to stand for two very different entries on the balance sheet. On the one hand, people talk about reserves of federal funds and vault money, and on the other hand of reserves of capital or equity. Looking at the balance sheet, these are obviously different things. We will concentrate first on cash reserves. These reserves are assets—in other words, something the bank owns. Ignoring vault money, they are those federal funds held on deposit with the central bank, which are available to facilitate interbank transactions, ensuring that the bank can meet its obligations relating to day-to-day money transmission within the financial system; to facilitate

Table 5.1 Bank balance sheet

Assets (what the bank owns)	*Liabilities (what the bank owes) + Equity*
Cash Reserves (including federal funds)	**Deposit Liabilities** (and other liabilities)
Credit to customers (and other assets)	**Equity Reserves**

private-sector–public-sector transactions; and to allow for other transactions between the private bank and the central bank. Textbooks down the ages have commonly assumed a requirement for banks to hold a fixed minimum ratio of cash reserves to deposit liabilities, and often, to make the sums easy, have set this ratio at 10%, which happens to be the current requirement of the US Federal Reserve.

In practice, many countries do not have such a requirement, or set it at zero, although others, including, as I have just said, the USA, still maintain such minimum reserve requirements for private banks. When the central bank pays no interest, or a below market rate of interest, on federal funds, such a requirement can be seen as a tax on the banking system. In countries like the USA, where reserve requirements are calculated as averages over a period of time, rather than on a continuous basis, there are technical reasons which I will not explain here why having such a requirement simplifies the task of the central bank in managing the supply of liquidity to the banking system. What such requirements certainly do not do, and have not done, at least for many decades, in countries like the USA, is to limit the ability of private banks to create credit, and by doing so to create horizontal money and to add to the money supply.[14]

Banks definitely do not need additional reserves, or excess reserves, to facilitate additional lending. Central banks like the Bank of England and the Federal Reserve have made this clear on numerous occasions, in a variety of publications, but it is something many bankers know from experience. As Alan Holmes, the then Vice-President of the New York Federal Reserve, said in 1969, before the breakdown of the Bretton Woods System, 'In the real world, banks extend credit, creating deposits in the process, and look for the reserves later'.[15]

When a bank provides a customer with credit, this requires two balance sheet operations, neither of which involves reserves. If the bank lends its customer $1000, then what the bank is actually doing is exchanging financial claims with its client. The bank now owns the loan agreement signed by its customer. This is a financial asset for the bank and a financial liability for the customer. It is a financial claim the bank has on the customer. At the same time, the bank has created an additional deposit on which the customer can now draw. This is a financial asset for the customer and a financial liability for the bank. It is a financial claim the customer has on the bank. Credit to customers has increased by $1000 on the asset side of the balance sheet. Deposit

liabilities have risen by $1000 on the other side. Until the funds are spent, there are no implications for reserves—even then, if they are simply transferred between customers of the same bank, as often happens in highly concentrated banking systems, there are no implications for federal funds.

It is possible that this deposit creation might require the bank to supplement its reserves, either as a result of reserves being depleted by a subsequent transfer of funds between accounts held at different banks, or to meet minimum reserve requirements, now that deposit liabilities have been increased. In the USA, reserve requirements have to be met on average over a two week period seventeen days *after* the end of the two week period during which the minimum level of required reserves is calculated. It is very clear that in the USA, banks create credit now and then go about acquiring the necessary reserves later. It is not the other way around. Even if it was the other way around, and if banks did need reserves before they were permitted to create additional credit, if reserves were freely available, a shortage of reserves would never prevent a bank from providing credit to customers it deemed to be creditworthy who were prepared to pay market interest rates. And remember, in countries like Canada and Australia, there are no such minimum cash reserve requirements at all.

Additional reserves of federal funds, or exchange settlement balances, are always available, in practice, for very good reasons. Central banks must ensure that this is the case, or they would lose control of overnight interest rates on the money market, which would invite financial instability and a potential crisis. The over-riding responsibility of central banks is to maintain the stability of the banking and monetary system. Consequently, central banks buy and sell government and other securities, and engage in lending and borrowing on the money market every day, to ensure that sufficient liquidity is available to the banking system to prevent money market interest rates from spiking. Banks looking for reserves will normally borrow them overnight or short term from banks with excess reserves. It is the job of the central bank to ensure that it supplies sufficient reserves to the system to allow for this to take place. In other words, central banks must ensure a sufficient monetary base, to meet the aggregate needs of the banking system, and to avoid volatility on the money market (Fullwiler 2017).

The sequence of events is that banks create credit by lending to customers. This can, over time, lead to an additional demand for reserves

in the banking system. The central bank can and does meet this demand for reserves by creating them, often simply by purchasing government securities from the private sector and paying for them by crediting bank federal funds reserve accounts. This allows the central bank to maintain the federal funds rate at its target level. The banking system does not require these reserves in order to lend. The central bank is forced to supply the reserves after the event. To do otherwise, as was experimented with briefly in the USA at the beginning of the 1980s, and even more briefly in China in the middle of 2013, is to invite volatile interest rates and a dysfunctional banking system.

Orthodox textbooks often rewrite expressions for H and MS, defining c as the ratio of currency at issue to total deposits and r as the required cash ratio of the private banks, so that $C = cD$ and $R = rD$ (at least if we assume no banks have any excess reserves).

$H = cD + rD = (c + r)D$, and $\text{MS} = cD + D = (1 + c)D$. You can then define the 'money multiplier', MM, as follows:

$$\text{MM} = \frac{\text{MS}}{H} = \frac{(1 + c)}{(c + r)}. \tag{5.10}$$

If we assume $r = 0.10$ (a 10% minimum cash reserve ratio) and $c = 0.03$ (let's accept the statement that only 3% of the money supply is fiat money), then the resulting 'money multiplier' would have a value of almost 8. But it isn't really a multiplier at all. It would only be a genuine multiplier if banks needed additional reserves before they could increase lending, and were always faced with a queue of unsatisfied but creditworthy potential borrowers to lend to, so that the creation of additional reserves automatically caused additional credit creation. If that was true, central banks could control credit creation and the money supply by limiting the supply of reserves and base money, or increasing the required reserve ratio. History tells us that this is not the case, and that attempts to do just this have ended in failure. An understanding of how our monetary institutions work tells us that things could not possibly work this way. In practice, during periods when there has been any correlation between the growth in the monetary base and the money supply, it has been because of a 'money divisor' and not a 'money multiplier'. Increases in the money supply due to additional lending have eventually increased the demand for reserves in the banking system, which the central bank has then had no alternative but to supply. Consequently, the monetary base has increased endogenously, in response to endogenous

money creation. Central banks do not control any measure of the money supply, and outside of periods when they create excess reserves through quantitative easing, they do not control the amount of base money in the system either. Both are determined endogenously. There is no money multiplier. Central banks, instead, manage short-term interest rates, and as recent experience has shown have the power to control long-term rates too.

During and after periods of large-scale reserve creation due to quantitative easing, as in the USA, Europe, Japan and the UK since 2008, there can obviously be no shortage of reserves in the banking system, and the notion of a money multiplier effect becomes an absurdity. This did not stop some economists, policy-makers and commentators forecasting hyperinflation when quantitative easing was first implemented. More recently, it has not prevented them arguing that the money multiplier has only failed temporarily, because interest rates are at 'the lower bound', or because banks don't want to lend. They have continued to worry about banks 'using excess reserves' to facilitate a credit binge when the economy has picked up. All this is nonsensical, and based on a misunderstanding of the microeconomics of banking. Banks do not need reserves to lend in the first place, as I have explained. Consequently, supplying excess reserves to banks as a result of large-scale purchases of government securities and other assets from the private sector does nothing to encourage or force banks to create additional credit. All quantitative easing can do, and has done, is to have an impact on the prices of and yields on those assets that the central banks have purchased, notably long-term government securities, and consequently broader effects on financial markets. Other than that, QE has not been inflationary, which should surprise no-one who knows it mainly involves swapping one interest-bearing government liability (reserves) for another very similar one (government bonds). In so far as the interest rate on reserves is below the interest rate paid on government securities, quantitative easing can even be deflationary, since it reduces future interest payments from the consolidated government sector to the private sector.

The creation of excess reserves has also changed the approach those central banks which have engaged in quantitative easing have used to control official interest rates, as we shall see. Before doing so, however, let us return to our simplified bank balance sheet and discuss the nature and purpose of the other form of reserves, which are to be found in the bottom right-hand corner—equity reserves.

Equity reserves are not assets of the bank. They are not something the bank owns. Instead, they are calculated as a residual, by deducting the bank's deposit and other liabilities (corporate bonds and money market debt securities issued, etc.) from the value of the bank's assets. They are the value of the net assets, or net worth, or equity capital, or equity reserves of the bank. In practice, the definition of a bank's capital base is complicated, and to discuss it would involve distinguishing between tier one and tier two capital, and delving into a variety of hybrid securities and accounting jargon. Let us keep it simple. Our definition is similar to what bankers call common-equity tier one capital. It is shareholders' stake in the bank. It can be increased by selling additional shares to the bank's shareholders, but the normal reason for a bank's equity to rise over time, at least during good times, is the accumulation of retained profits. When a bank makes an after-tax profit and does not pay it out in dividends to its shareholders, the net asset value of the bank will increase, which means its equity reserves will rise.

While a bank does not need cash reserves to lend to its customers, it does need equity reserves, either to make additional loans or to take other banking risks. Since the late 1980s, there have been international regulations relating to bank capital adequacy, which started off relatively simple, but have become very complicated. They are often called the Basel rules, as they were negotiated, and have twice been renegotiated, by central bankers at the Bank for International Settlements, in Basel, in Switzerland. We will avoid discussing things like operational risk, risk-adjusted assets, and the use of banks' internal risk models, and grossly oversimplify again, to focus on the issue of interest to us. That issue is the fundamental purpose of these equity reserves. Equity reserves are there as a shock-absorber, supposedly ensuring that the bank remains solvent, and in a position to repay its depositors and other creditors without government assistance, even after the bank has made losses due to the non-repayment of loans by its customers, or for reasons relating to other banking risks. What the capital adequacy regulations do is to require banks to increase their equity capital to a minimum level before they are permitted to take on additional risks, including the risks associated with additional commercial lending.

So it is true that banks create horizontal money from out of thin air. It is true that this credit money can add to the fragility of the financial system, as it creates a debt which the customers of the bank will be required to repay in the future. It is not true that the government needs to, or

even could, borrow this money from the banks. Indeed, the only way banks can purchase government securities when they are issued is by using their reserves of federal funds, which are of course base money, or vertical money, or we might say government money. It is true that banks don't require cash reserves or balances at the central bank before they create credit. It is not true that banks face no limitations on their ability to lend. Before they can lend, they need to find creditworthy customers who want to borrow, and who are prepared to pay high enough interest rates to allow the bank to make a profit. They also need to meet the rules laid down by the banking regulator, which in many countries is the central bank itself. Most notably, they need to have sufficient equity capital to meet the Basel rules, as interpreted and enforced by the local banking regulator.

There have been many scandals involving major banks in recent years, and there are undoubtedly serious flaws in banking regulation. Most modern monetary theorists would like to see a banking system which serves the capital development of the economy, rather than acting as a facilitator of, and participant in, speculative financial markets. This involves concentrating more on the assets side of a bank's balance sheet, and less on its liabilities and equity. The core activities of commercial banks are, after all, running the money transmission system, and the creation of credit. It would be a simple matter, using our current technology, to locate money transmission and transaction accounts in the central bank, or at least in a public institution. This leaves the underwriting of private debt and the creation of credit as the core economic functions of private commercial banks. If it seems reasonable to argue that private, regulated institutions do a better job in identifying creditworthy borrowers, and financing projects contributing towards sustainable prosperity, than a government institution would do, then there is a case for the existence of private banks. However, they are effectively operating as franchisees of the state. The government has extended them a franchise to create money, in the form of their deposit liabilities, backed by the government's guarantee.

Banking practices which do not involve money transmission or forms of lending consistent with the pursuit of sustainable prosperity should be restricted or forbidden. There are good reasons to consider breaking up the largest banks, to remove the moral hazard associated with 'too big to fail' institutions, and for reducing their political influence. There are good reasons to consider a return to banks concentrating on a narrow range of activities, and a modern-day version of the Glass–Steagall Act,

with its separation of commercial and investment banking. There may be good reasons to consider the partial, or even wholesale, nationalisation of commercial banking, outside of small mutual banks. There is much that needs to be changed, or where a good case can be constructed for changes, but we do not need to eliminate the ability of deposit-taking institutions to create money by creating credit, and indeed we should not do so. We do not need 100% reserve banking. Most of all, we do not need a committee of 'experts' deciding somehow on how much money should be created each year. Those who argue for this kind of reform do not, in my view, understand the importance of an elastic supply of credit in the capital development of the economy, or the fact that monetary sovereign governments are already free of financial constraints; are already in a position to regulate the banking system effectively; and could already ensure it operated in the best interests of sustainable prosperity, should they find it politic to do so.

Hyman Minsky famously said that anyone can create money, but the problem lies in getting it accepted.[16] Government money is accepted as having value because people need to get it, in order to pay their taxes and make other payments to the government (Bell 2001). The tax-collecting power of the state lies behind fiat money. Its acceptance is not based on trust, but on the willingness of the state to use its tax-collecting powers to defend the value of the currency. Bank deposits are accepted as having value because they can be used to repay debts to banks, and to others, at par, and because there is a guarantee that they can be converted into government money at par, and in the case of transaction accounts, on demand. Other private-sector financial liabilities will have at least some of the characteristics of money if they are issued by a borrower with a very high credit rating, and if that borrower agrees to take them back on demand, or to accept them in the repayment of debts to itself, at par against government money. Alternatively, private-sector financial liabilities might be seen as being almost as good as money, or 'quasi-money', even if they cannot be used directly in exchange for goods and services, where they are easily transferable, like debt securities, in a highly liquid secondary market, if their value on that secondary market is stable, and if they have virtually no default risk. The distinction between 'near monies', or 'quasi-money', and bank deposits can become blurred, so that the owners of these assets forget that they are further down the monetary hierarchy than insured bank deposits, and consequently more risky to hold, as was the case with units in money market funds in the USA prior to the financial crisis.

As Keynes said, 'we can draw the line between "money" and "debts" at whatever point is most convenient for handling a particular problem'.[17] While monetary sovereign government securities, including bonds, are generally not included in official measures of the money supply, they are default risk-free assets for the private sector to hold, and if they are held to maturity, they have a safe nominal value. What is more, they are not really debt, in the conventional sense of a burden which must be paid back, at all. Their prices on the secondary market vary over time in line with changes in default risk-free interest rates, although we should not forget that central banks can control these rates and prices, should they choose to do so. Government bonds are effectively a transferable term deposit at the central bank, and I would like to see them formally redefined as such. They could then be regarded as a form of broadly defined vertical money, rather than being subject to the 'government as household' debt metaphor. It is a mistake to obsess over precise definitions of monetary aggregates, and all money is some form of debt in any case, as we have already established, but I still believe this reform would have a transformative effect on the discussion of the government's fiscal stance.

During periods of euphoria on financial markets, private-sector debt securities can become seen as almost identical to government securities, as happened with mortgage-backed securities in the lead up to the Global Financial Crisis. They came to be seen, as 'quasi-money', and were erroneously classified as such by the credit-ratings agencies. The distinction between vertical government 'money', including government securities, and uninsured private-sector financial liabilities, is one which ought never to be forgotten by banking supervisors, central bankers and governments. There is no good reason for private asset-backed securities, or credit derivatives associated with, them to exist at all. The practices which led to the Financial Crisis should never have been permitted. We did not need them.

Monetary Policy in the Real World

It is time to examine in more detail the management of official interest rates by central banks, both before the Global Financial Crisis, and during and after the years of the alternative monetary policies which have followed it. As we shall see, the practices of recent years have played

into the hands of modern monetary theorists. They have demonstrated firstly that interest rate cuts can have at best a temporarily positive effect on credit creation and spending, and that there is no stable relationship between total spending and official interest rates; secondly, that the money multiplier theory is nonsensical, to the point that nobody defending it can be regarded as having any understanding of banking and finance; and thirdly, that central bankers can control not only short-term interest rates, which could be set permanently at zero, but also interest rates on long-term government securities, as in Japan.

In the interests of clarity, I intend to abstract from certain characteristics of the US monetary system which do not substantially change what I am going to describe. The existence of minimum cash reserve requirements does not change how the system works in any fundamental ways, so I will ignore them in what follows. Access to the federal funds market on the part of non-banking institutions is also something I am going to ignore. Readers can imagine that I am discussing a simpler modern monetary system that of the USA, such as that of Australia or of Canada. My justification is that simplifying assumptions are valid when they make an explanation simpler to follow, but do not affect is validity.

In the banking system I am going to describe, there has been no quantitative easing and banks in aggregate hold no excess reserves. Banks collectively hold the reserves they believe they need to hold to facilitate money transmission. Every day, as a result of the millions of transactions which take place within the monetary system, there are transfers of these reserves from bank to bank. This causes some banks to accumulate reserves, and others to run short. Under normal circumstances, the banks accumulating excess reserves lend them overnight (or very short term) to the banks which have run short. This overnight lending, which is essential to the smooth running of the system, takes place at an interest rate we will call the federal funds rate. In Australia, it is called the cash rate. This rate is the normal marginal cost of liquidity to a bank and is a key interest rate with reference to which other interest rates in the economy are set. It is the private-sector interest rate the central bank wishes to target. In countries like Australia, with relatively simple and highly concentrated banking systems, this target can be achieved with high precision almost all the time.

For the central bank to hold the federal funds rate at its target level (in more complicated systems, like that of the USA, there is a target range rather than a single target rate), it must manage the supply of

liquidity to the banking system. This involves either outright or repo transactions in government securities, and sometimes in other financial instruments, with the private sector. It is simpler to assume outright transactions for our purposes, although central banks mainly use repos these days. Should the central bank anticipate a shortage of reserves in the banking system, then to prevent this shortage from driving the federal funds rate above target, the central bank must make net purchases of bonds from the private sector, paying for those bonds by crediting the reserve accounts of private banks, and thereby alleviating the cash shortage. If there is an expected surplus of reserves, the central bank must withdraw those reserves from the system, to prevent the federal funds rate falling below its target. It can do this by making net sales of existing bonds which it holds on its balance sheet, or could do so equally well by issuing its own debt securities and selling them. The supply of reserves must react endogenously to fluctuations in the demand for reserves.

This will need to happen at least once a day, and often more than once during each day, so that the central bank can ensure the right quantity of reserves is held within the system. The demand for reserves will fluctuate from day to day for a variety of reasons, most notably as a result of transactions taking place between the federal government and the private sector. Government spending feeds reserves into the banking system, as do payments made by the government on maturing bonds, putting downward pressure on the federal funds rate. Taxation and new issues of government securities take reserves out of the system, putting upward pressure on the rate. For the central bank to offset these pressures and hit its target interest rate consistently over time, it needs to coordinate its trading (commonly called 'open market operations') with the Treasury. The two do not and cannot act independently of each other.

This allows the central bank simply to announce a target for the federal funds rate, which will then be used by the banks on overnight interbank loans, in the knowledge that the central bank will continue to ensure the right quantity of reserves remains in the system. The demand for reserves, at least in the short run, is very insensitive to changes in the federal funds rate, so that the central bank does not have to inject additional reserves into the system with the express purpose of cutting the rate. All the central bank has to do is to announce a change in the federal funds rate, and it automatically takes place. This is how the system works—or at least, it is more or less how the system used to work

in countries like the USA and the UK before the advent of quantitative easing, and the consequent provision of high levels of excess reserves to their banking systems. Ending quantitative easing does not in itself eliminate those excess reserves, so that there are still excess reserves in the US banking system in 2018, even though quantitative easing was ended in 2014.

In countries like Australia, where official interest rates did not fall to zero and quantitative easing was not used after 2008, the above description remains reasonably accurate. It can be illustrated in a diagram using an almost vertical demand curve for reserves on the part of the banking system, shifting outwards and inwards from day to day, with an endogenous supply of reserves at the policy rate ('federal funds rate') represented by a horizontal line. This implies an endogenous supply of reserves and so an endogenous monetary base, to go along with an endogenous money supply. Central banks neither control the money supply nor in the above system base money, which are both determined in the economy. What is exogenous is the interest rate. All this was explained many years ago by Nicholas Kaldor, and the horizontal supply curve of reserves was properly explained in the late 1980s by Basil Moore, just a few years before the development of modern monetary theory (Fig. 5.2).

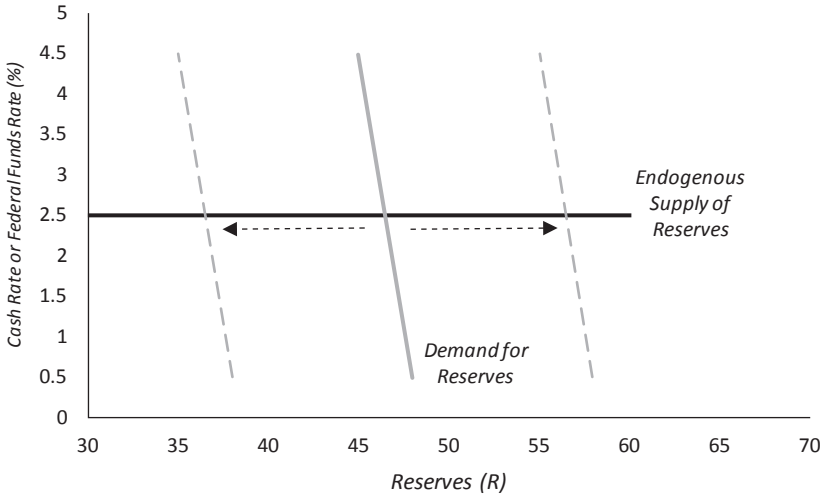

Fig. 5.2 Endogenous reserves

Most countries also have a corridor system for bank reserves, whereby interest is paid by the central bank on reserve balances (a 'deposit facility'), normally at a rate below the policy rate described above, and the central bank engages in direct overnight lending to banks (a 'borrowing facility'), normally at a rate above the policy rate, to encourage banks to rely on the overnight market, and to use this facility rarely. In Australia, the corridor is + or – ¼%, so that interest is paid on the deposit facility by the Reserve Bank at a rate 0.25% (or 25 basis points) below the cash rate, and interest is charged on the borrowing facility at a rate 0.25% above the cash rate. The cash rate, remember, is the Australian term for their federal funds rate. The system in the USA is, as always, a little more complicated, but essentially similar. In the following diagram, the cash rate is assumed to be 2.5% pa (Fig. 5.3).

The deliberate provision of excess reserves, as a result of quantitative easing, in the USA, Japan, the Eurozone and the UK, among other countries, after the Global Financial Crisis, changed the interpretation of policy interest rates in these places. Since almost all banks now had more reserves than they needed for money transmission or regulatory purposes almost all the time, the overnight interbank market more or less disappeared, and the borrowing facility at the central bank became almost

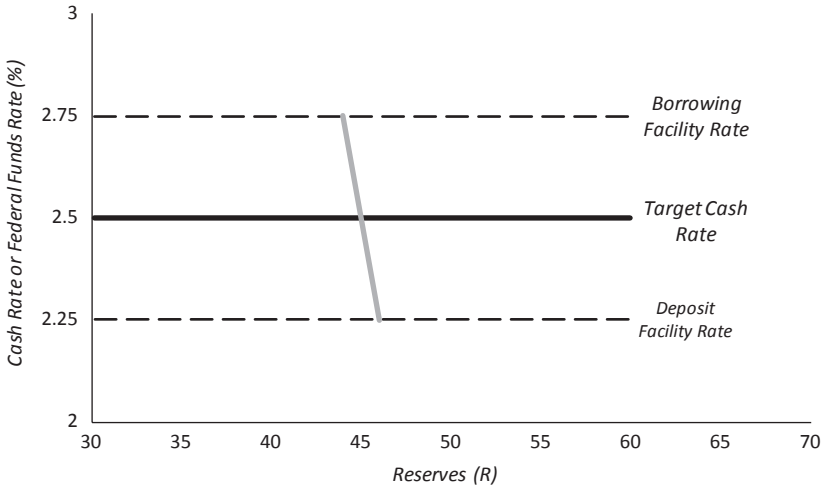

Fig. 5.3 The corridor system

irrelevant. The official interest rate became the rate paid by the central bank on excess reserve balances. Central banks did not lose control over official interest rates as a result of providing excess reserves to the banking system; they simply changed the mechanism for setting official rates. They also inadvertently simplified it. They demonstrated that increases in the monetary base do not have to drive money market interest rates down to zero. This of course also demonstrated that fiscal deficits do not have to be financed through the issuance of government debt securities in order to avoid driving interest rates down. Outright monetary financing of fiscal deficits just creates reserves in the banking system. These reserves are not inflationary, because the money multiplier is a fallacy. They do not even need to force interest rates down, since excess reserves simply drive interest rates to the rate paid by the central bank on the lending facility.

The impact of excess reserve creation, whether it is the result of quantitative easing, or of the deliberate outright monetary financing of fiscal deficits, is best shown by reverting to a vertical supply curve of reserves to the system. In other words, quantitative easing makes the monetary base an exogenous variable. It is, however, an exogenous variable without any relationship to credit creation or inflationary pressures (Fig. 5.4).

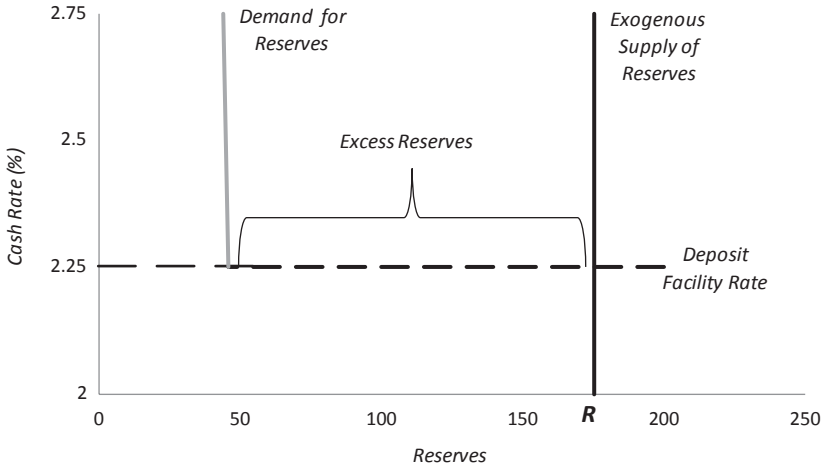

Fig. 5.4 Excess reserves

To set the official interest rate at zero, regardless of whether that rate is called the federal funds rate or cash rate, or something else, all the central bank needs to do is to set the interest rate it pays on bank reserves at zero. Having done this, major central banks were said to have hit the 'lower bound'. Prior to 2013, it was unthinkable to move beyond zero, and into the territory of negative official interest rates. Then, the Danish central bank did exactly that, and the 'zero bound' was a bound no longer. Denmark was followed by the Eurozone, Sweden, Switzerland and later by Japan in introducing negative official interest rates.

If you have never come across negative rates before, they can be a difficult notion to grasp, but in fact a negative rate on bank reserves is quite simple. It is just a tax on the reserves held by the banking system. The idea was to encourage banks to lend to their customers, and by doing so to pass these reserves onto other banks, and minimise their exposure to this interest rate 'tax'. Other than by withdrawing reserves from the central bank in the form of physical currency, there is nothing the banking system as a whole can do to rid itself of these reserves. Banks cannot lend these reserves to you and me, since we do not have reserve accounts at the central bank. They can just pass them around between themselves, like hot potatoes. If a bank creates a lot of credit, and this leads to transfers of funds from accounts at that bank to accounts at other banks, the bank will be able to pass some of its excess reserves to those other banks—getting rid of these undesirable hot potatoes.

However, this measure and other tools of alternative monetary policy not discussed here do not appear to have been very successful in stimulating additional credit creation, and even if they had been, it might have involved an already weak private banking sector taking on inappropriate risks. All such a tax on the banking system is liable to do is to encourage banks to pass the cost on to their customers, in the form of fees and charges. So why do it? And what was the point of all that quantitative easing, which massively expanded central bank balance sheets and the monetary base in a number of countries, but had at best a limited impact on the real economy?

It was a case of central bankers knowing that something had to be done to stimulate economic recovery; knowing that the key lay in fiscal policy; not having the legal power to change fiscal policy, which is under the control of politicians; and so doing what they could through the use of monetary policy to encourage additional lending and spending, even

though most, if not all, central bankers knew this not to be the most effective response to the recession of 2009. The key lay in fiscal policy, because it is only fiscal policy which can increase the net financial assets of the private sector, and allow for economic recovery while private-sector balance sheets are being repaired. Money spent into existence due to fiscal policy is money which does not have to be paid back.

Economists at the Bank for International Settlements have coined the term 'decoupling',[18] to refer to the fact that the payment of interest on reserves means that the provision of excess reserves to the banking system no longer places downward pressure on interest rates, when official interest rates are understood to be the rate paid on reserves balances by the central bank. To the extent that the issuance of government debt securities could previously have been justified as necessary to drain excess reserves from the system to prevent the central bank losing control over interest rates, this justification no longer applies. There is no longer any compelling need for monetary sovereign governments to issue bonds and other debt securities. As I said above, term deposits at the central bank would fulfil any remaining functions of government debt securities equally well, without creating the impression that the government needed to borrow to fund its net spending.

The mystery is that all the above is not universally understood. Given a proper understanding, there would now be a well-informed discussion of the implications of all this for the appropriate role for fiscal policy; the importance of monetary sovereignty; what to do about official interest rates and monetary policy; and how to re-regulate and re-structure banking and the financial sector more generally. It should be beyond debate by now that an arbitrary target for the fiscal balance is mistaken. It is a barrier to the elimination of involuntary unemployment and the pursuit of sustainable prosperity. This will be clearer still, following our discussion of stock-flow consistent monetary economics, which follows in the next chapter.

Notes

1. Knapp (1924).
2. Mitchell-Innes (1913, 1914).
3. 'Our knowledge of the monetary systems in primitive and early societies is necessarily somewhat sketchy. Nevertheless I believe that the consensus among historians and anthropologists is that money developed as a social

(and governmental) artefact, rather than as a mechanism for reducing transactions costs in private-sector markets' (Goodhart 2009, 828).

4. Graziani was the founder of modern monetary circuit theory and clarified its Marxist roots. It can be related back to the French economist Jacques le Bourva, and even to Knut Wicksell, in the sense that it is an endogenous, credit theory of money (Ehnts and Barbaroux 2017). There are similarities with the work of Hyman Minsky. Although the emphasis is on the private sector, rather than on the state, it is completely consistent with modern monetary theory. Modern economists influenced by monetary circuit theory include Marc Lavoie, Steve Keen and a variety of others broadly sympathetic to modern monetary theory.
5. Moore (1988).
6. Quoted in Colander (1984).
7. For example, in Kaboub et al. (2015).
8. And has been confirmed to be so, by a long list of authorities; including, on more than one occasion, Alan Greenspan, Chairman of the Federal Reserve from 1987 until 2006.
9. This is among the criticisms of modern monetary theorists listed by Marc Lavoie in a broadly supportive paper in 2013.
10. The European Central Bank announced its Outright Monetary Transactions programme in September 2012. Simply the promise to buy government securities if necessary was enough to bring down the yields on government bonds, such as those of the Portuguese government, by a dramatic amount. Default risk had been taken off the table.
11. Fischer and Easterly (1990, 135).
12. William Mitchell, on his *Billyblog* site, http://bilbo.economicoutlook.net/blog/, has explained this on many occasions.
13. Mitchell-Innes (1913, 402).
14. This is explained with great clarity in Fullwiler (2017).
15. Quoted in Fullwiler (2017); and in many other places.
16. Quoted in Wray (2016, 94); and in many other places.
17. This is written as an endnote to page 167 of Keynes (1936).
18. Borio and Disyatat (2009).

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CHAPTER 6

Stock-Flow Consistent Monetary Economics

The stock-flow consistent approach to monetary analysis was developed and pioneered, between the 1970s and the 2000s, by Wynne Godley, initially at Cambridge University and later at the Levy Institute of Bard College in New York. Two co-authored books were important in the process. The first of these was a textbook in stock-flow consistent macroeconomics, written with Francis Cripps in 1983, which proved to be many years ahead of its time, and so was largely ignored when it was published. The second, which was written with Marc Lavoie and published in 2006, is a demonstration of, and virtually an instruction manual in, how to build sectoral stock-flow consistent models in the Post-Keynesian tradition. This second text was published at exactly the right time, has proved to be seminal and may yet play a significant role in shifting the economics discipline in the decades to come. I apologise for the cliche, but it really is too soon to tell how important their *Monetary Economics: An Integrated Approach to Credit, Money, Income, Production and Wealth* will prove to have been.

We have already established that any useful macroeconomics must be based on some form of monetary analysis, and I have explained that the three axioms of modern monetary theory, outlined in Chapter 5, must be incorporated into that useful macroeconomics.

As yet, however, because we have not covered Godley's work, it may appear that we lack an approach to model building which we can offer central banks, finance ministries and other institutions, as a replacement for the misleading dynamic stochastic general equilibrium models

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which I discussed, and rejected in Chapter 2. Those models are very attractive to policy-makers and pundits, as well as to orthodox economists, since they purport to describe how the various parts of the economy fit together, and can be used to carry out policy simulations, and to generate forecasts. Such forecasts have been shown to be unreliable and misleading, but nevertheless they are still widely used, and orthodox economists commonly react emotionally and dismissively to the suggestion that they might have to be abandoned.

Godley and Lavoie have provided us with a framework for building monetary macroeconomic models, which can be put up against the orthodox general equilibrium approach and easily shown to provide a superior way of describing how the various sectors of an economy evolve over time. Modern economies are best imagined as sets of interlocking balance sheets, evolving together over time, with the potential to become increasingly fragile, so that a major financial crisis is always a possible future state. They are far from the stable Walrasian system, which provides the foundations for the various types of dynamic stochastic general equilibrium model that are so firmly entrenched in orthodox macroeconomics, but so badly in need of replacement.

The Godley approach is far more suited to identifying trends which are likely to be unsustainable and liable to lead to financial instability and crisis in the absence of effective government intervention.[1] It can also be used to generate contingent forecasts, although those forecasts are best thought of as outcomes which could feasibly happen, rather than what will actually happen, as the economy is an uncertain and complex system. Policy formation cannot therefore be about optimal fine-tuning, but instead about the construction of automatic stabilisers, such as a counter-cyclical fiscal policy supported by a job guarantee. The value of such an approach can be demonstrated within such a framework, which can also be used to simulate the consequences of a variety of events within the economy, and among other things to show the limitations of monetary policy as a tool of demand management.[2]

It is also consistent with the monetary macroeconomics of Keynes, Kalecki, Davidson and Minsky, which I outlined in Chapter 3. They refer in their book to Simon's procedural rationality, in the context of decision-making, which I discussed in Chapter 4. There are references in their *Monetary Economics* to the work of modern monetary theorists Randall Wray, Warren Mosler, Matt Forstater and Scott Fullwiler. Their approach to modelling, because of its fidelity with what Nicholas Kaldor[3]

would have called 'stylised facts' about the monetary system, is supportive of the laws of functional finance and the axioms of modern monetary theory, which I explained in Chapter 5.

There are close parallels, in some respects, between Godley's work and the approach taken to stock-flow consistency by the orthodox economist, and Nobel laureate, James Tobin (Brainard and Tobin 1968), and indeed Godley acknowledged his debt to Tobin, where the modelling of asset demands is concerned. However, Tobin was a neoclassical synthesis Keynesian, and like many others struggled to reconcile a realistic approach to financial markets with a general equilibrium model of the economy. It is impossible to think in terms of general equilibrium, which is essentially a model of a barter economy, and to get money and finance right, without logical inconsistencies. A consequence of the fashion for internal logical consistency in orthodox macroeconomics from the early 1980s onwards was the sidelining, and even abandonment, of Tobin's so-called New Haven approach. There is no need for it, and even no room for it, in a general equilibrium framework. That is not to say that modern orthodox economists never mention stock-flow consistency. To them, though, the notion is limited to ideas such as the misleading discussion of fiscal sustainability which I discussed in the previous chapter and has little in common with the hard monetary model of this chapter.

Accounting for Stocks and Flows

In the late 1930s, Michal Kalecki is supposed to have said, 'I have found out what economics is; it is the science of confusing stocks with flows'.[4] We do not want to fall into that confusion here, so I would like start my discussion from first principles and move to the model in, hopefully, easy steps. Please be patient, as I promise it won't be long before we dive headlong into our stock-flow consistent macromodel, but I want to avoid haste.

Let us start by looking at a very simple balance sheet, listing the values of all the assets and liabilities of an individual called Steven (Table 6.1).

Steven's assets are listed on the left-hand side of his balance sheet. His assets are what he owns. His real assets, or tangible assets, include his house, if he owns one, and any durable goods he owns, like his car. His financial assets include any cash he may have, and also any financial claims he has on anyone else, or any institution, in the economy. They are liable to include bank deposits, and may also include common stocks (or shares) in companies, and a variety of other financial claims, like units

Table 6.1 Steven's balance sheet

Steven's balance sheet at the beginning of the month	
Assets	*Liabilities and net worth*
Real assets $500,000	Financial liabilities $400,000
Financial assets $100,000	Net worth $200,000

in investment funds. His deposits are obviously claims on banks, which will often be repayable on demand, and generally have a guaranteed dollar value. They are financial assets for him, but financial liabilities for his bankers. A neutral term for them is financial instruments.

If he owns stocks, they are a claim on the companies which issued them, of which he is a stockholder and legally a part-owner. This claim is a contingent one, in the sense that if a company makes a net profit and its directors choose to payout part of that profit in the form of dividends, he will be entitled to his share of those dividends. The market value of his stocks is not guaranteed. Although companies have no legal obligation to pay dividends to stockholders, most companies normally do so, and for our purposes, corporate stocks will be interpreted as financial liabilities of the companies concerned. This is also necessary for the accounting of our stock-flow consistent model, since it is essential that every financial instrument is both an asset and a liability. The sum totals of financial assets and financial liabilities in our monetary system will have to be the same, so that they cancel out. Common stocks issued by listed companies are financial instruments which can be bought and sold on a secondary market, like government or corporate bonds, and as such are also sometimes referred to as securities.

The market value of everything Steven owns comes to $600,000, but this is not a good measure of Steven's wealth. Steven's monetary wealth is given by his net worth. To calculate his net worth, we need to deduct the value of any financial liabilities Steven has from the total value of his assets. His financial liabilities are his debts. Perhaps Steven has only one debt, which is a mortgage from his bank, with a balance owing of $400,000. This is a financial claim the bank has on Steven. It is a financial asset for the bank, just as it is a financial liability for Steven.

Since the market value of Steven's assets exceeds the value of Steven's liabilities, Steven has a positive net worth, or net equity of $200,000. He is solvent. He could sell off his assets at their current market prices,

repay his debts in full and have some money left over. This could change though. His house and his shares, for example, could both fall in value in an economic downturn, which could easily wipe out his net worth, and leave him with a negative equity. If he then lost his job and so his income from employment, and was unable to make the repayments on his mortgage, he could easily go bankrupt. The more debt he is carrying, the greater the risk of such an outcome.

We have met the concept of net worth, or net equity, before, when discussing banking regulation in Chapter 5, where we defined the net equity of a bank as its capital. It is not only for banks, or other financial institutions, or non-financial corporations, that balance sheets matter. Household balance sheets are of great significance, and a shift in household balance sheets from Minsky's 'hedge' form to speculative and even Ponzi forms over time is a signal of growing fragility in the system, and that the apparent prosperity of the moment may not be sustainable. Minskian instability cannot be accommodated in orthodox models of the economy, but it fits comfortably into our framework, since we make no assumptions about optimising behaviour by super-humans with extraordinary foresight.

The items in Steven's balance sheet, above, are stock variables. They are recorded at a moment in time, and their current values are the consequences of transaction flows arising over time, as well as of asset revaluations driven by changes in property, stock and other prices. It is important to notice that the two sides of the balance sheet must by definition always come to the same total—balance sheets always have to balance. This means that no single item on Steven's balance sheet can change without at least one other item changing, to ensure it remains in balance. Even just an increase in the market value of a stock owned by Steven will involve two changes. The value of one of his financial assets increases, and if nothing else changes, his net worth increases by the same amount. The same thing is true of transactions Steven engages in over time—every single transaction must involve at least two changes in his balance sheet. The same thing will be true when transactions are aggregated, over a period of time. At any moment in time, his balance sheet provides a snapshot of the consequences of these transactions and market changes.

Suppose that, over a month, Steven receives income from his employer of $2000 and uses $1500 for consumable goods and services and mortgage interest, but does not repay any of the outstanding principal on his mortgage. Suppose he does not engage in any transactions in real assets across the month, that the market values of his existing assets

do not change, and that those assets generated no income for him over the month. Suppose also, just to keep things simple, that he does not have to pay any taxes on his income, or that those taxes have already been deducted from his income, and that he has neither made nor received any transfer payments—for example, he has not given his son any money.

The $2000 from his employer will have gone into his bank account, while $1500 has been withdrawn from that account to pay for his consumption and to make his mortgage interest payment. He has saved $500, and his net worth has gone up by that amount. He has $500 of additional net financial assets, although perhaps I should say $500 less in net financial liabilities, since at the moment his debts are bigger than the financial claims he owns on others. He is a little richer, in any event. His financial assets have increased, and his net worth has risen from $200,000 to $200,500 as a result.

But all the above begs a set of questions and leaves a series of loose ends. He may be saving $500 out of his income, but what is he going to do with those savings? If he leaves them on deposit with his bank, that has implications for the bank's balance sheet. If he uses some of the money to buy shares, then if those shares are bought on the primary market from a corporation, this has implications for the balance sheet of the corporation; while if he buys them second-hand, the balance sheet of whoever is selling the shares he is buying will be affected.

And what of his employer? Those funds were drawn from the employer's bank account, and so have implications for the employer's balance sheet, but so do all the other transactions the employer has entered into, and any capital gains or losses the employer may have made on assets held. Perhaps his employer has borrowed from its bank the funds to pay his salary, in anticipation of future receipts from clients. In that case, this can be said to have created the money which Steven is now saving. But the loan too will have had implications for the bank's balance sheet. It is easy to see that our description of the economy as a set of interlocking and evolving balance sheets is the right way to think about any monetary economy, as it evolves over time. Moreover, it is easy to see that the balance sheets of some individuals and some institutions might evolve in ways which are unlikely to be sustainable. In a realistic and uncertain economic environment, procedural rationality based on heuristics and conventions is often all that is available. He may have some idea of how much debt it is wise, or normal, for him to carry, relative to his income, as may his bank, and other institutions he deals with. This is an example

of a stock-flow norm. But such norms cannot be based on optimising behaviour and rational expectations, as the information to allow for such calculations does not exist. Consequently, what is seen as normal or conventional behaviour is liable to change over time, and these changes may not be sustainable in the long run. Stability can breed instability. There are limits to how much debt households can carry, relative to their incomes, and what is unsustainable in the end will not be sustained.

Every financial asset held by any individual or institution is always a financial liability for another economic actor, whether it is a person, a corporation or a government. Consequently, in aggregate, financial assets and liabilities must cancel out, looked at across the whole financial system. For you or me, our wealth will include both our real assets and any net financial assets we hold. Even for entire countries, in a world of open economies, similar statements can be made. We can say that the wealth of Norway, for example, is given by its real assets and its net lending to the rest of the world. Norway is a creditor nation—it has positive net financial assets. But for the world as a whole, there can be no net financial assets, and so financial assets should not be regarded as part of our global wealth at all. We can have no net financial claims on another planet. For the world as a whole, our wealth depends on our real assets alone—our collective natural resources, capital and infrastructure, technology, available labour and skills, and most notably on our ecological resources. These are the things on which sustainable global prosperity for future generations will depend.

If we want to study the evolution of actual economies over time, we need to track not only Steven's balance sheet, but the balance sheets of all the other individuals in the economy, and of all its businesses and other institutions, including the central bank and the federal government. Moreover, all national economies are integrated, to a greater or lesser extent, with the economies of other countries around the world, and so the impact of trade flows, investments and loans across countries must also be taken into account. This might seem like a complicated thing to do, but since the economy is a financial system, as I said at the beginning of the chapter, we have no alternative but to try.

That said, a model of an economy, like a map, is not an exact replica of that which it is designed to represent, but a simplified description of it. The extent and nature of that simplification depend on the purpose of our model. For our purposes, it will be legitimate to aggregate balance sheets, transaction flows and behaviour at a sectoral level. We must not forget that by doing so, we inevitably sacrifice some information for the

sake of clarity. For example, when looking at the household sector, where some households have higher positive levels of net worth, but others have very low or negative net worth and are heavily in debt and exposed to financial risk, aggregating across the sector can make household balance sheets appear more consistent with a safe and secure financial system than is actually the case. High levels of gross indebtedness, and inequalities of both wealth and income, need to be monitored, as do holdings of speculative real and financial assets, when assessing the potential for a wave of household insolvencies to contribute towards a future financial crisis.

Sectoral Balances

Let us begin by looking at the standard three-sector chart for the USA, based on national income accounting data. The three sectors are the private sector, the government sector and the foreign sector. The financial balances of each sector can be interpreted as their net lending on the US financial system or acquisition of net financial assets, or just net saving, of each sector across each year. As such, the three balances must by definition always sum to zero:

$$\begin{aligned}\text{Private Sector Financial Balance} + \text{Government Financial Balance} \\ + \text{Foreign Sector Financial Balance} = 0 \\ \text{PB} + \text{GB} + \text{FB} = 0 \\ (S - I) + (T - G) + (\text{IM} - \text{EX}) = 0\end{aligned}$$

The foreign sector financial balance is the current account deficit on the American balance of payments. This is not identical to the US trade deficit, as the current account balance also includes net income from abroad, mainly in the form of profit, dividend and interest payments. Counterintuitively, the USA despite being a net international debtor since the mid-1980s, continues to enjoy positive net income. This is because its external liabilities are mainly interest-bearing, and interest rates in recent years have been very low, while its external assets are heavily foreign direct investments, which have remained profitable. If we ignore these net income flows for the moment, then the foreign sector financial balance can be written as (IM − EX), where IM stands for imports and EX for exports.

$$\text{FB} = (\text{IM} - \text{EX}).$$

The government financial balance is approximately equal to the federal fiscal surplus, which can be written as $(T-G)$, or taxes and other charges, net of transfers, less government purchases.

$$\text{GB} = (T - G)$$

The private-sector financial balance is the difference between private sector saving out of after-tax income and private-sector investment spending on real assets, being the acquisition of net financial assets by the private sector. It is sometimes referred to as net saving and can be written as $(S-I)$, with savings denoted by S and investment by I.

$$\text{PB} = (S - I).$$

The three balances equation can also be explained as resulting from the fact that one person's spending is another's income, or one economic unit's lending is another's borrowing, and as such is an identity. On its own, it says nothing about cause and effect, and in practice, the relationship over time between the three balances is complex.

What we can say, however, is that the government, while it can influence the private- and foreign-sector balances, cannot determine the value of either of them which is currently consistent with domestic full employment. The first depends on the net savings decisions of the private sector, and the second depends on the desire of the rest of the world to accumulate net financial assets in the domestic financial system. Both will vary over time, as a consequence of private-sector decisions and decisions taken outside the domestic economy. Consequently, if the government is determined to maintain the economy at, or close to, full employment, the fiscal balance must be allowed to vary endogenously to balance out decisions taken in the other two sectors.

In an economy with an increasing national income, if the private sector has a target ratio of net financial assets to income, then the private sector will normally have positive net savings desires. In an economy like the USA, with a current account deficit on its balance of payments for many years now and even before that only very small surpluses in the 1960s, it is reasonable to assume the foreign sector financial balance will remain positive and certainly will not be significantly negative. Consequently, the appropriate fiscal balance for the USA, in future, as in the past, will be a deficit, and the only question is then whether that deficit will be large enough to maintain equitable full employment, but not so large as to contribute to

inflationary pressures. This is reminiscent of the discussion of fiscal sustainability in Chapter 5, where I explained that a target for a balanced budget or a 'return to surplus' is nonsensical and dangerous (Fig. 6.1).

The only significant fiscal surplus in the USA over the past 60 years was the Clinton surplus of the late 1990s, as is shown in the chart. That this surplus was made possible by the opening up of a large private-sector deficit, associated firstly with a stock market bubble and later with the real estate bubble which burst in 2006–2008, is also clear, as is the necessity for a large fiscal deficit in 2009 and 2010 in order to allow the private sector to go into significant financial surplus, while preventing the Great Recession from turning into another Great Depression.

A similar story can be told in terms of the financial balances of other economies, including those of the UK and Australia, in the years before and after 2008. Australia ran fiscal surpluses for much of the period from 1996 to 2008, which would never have been possible in a country with a similar external position to the USA, without the private sector going heavily into deficit. Part of this private deficit in Australia was the result of a burst of investment spending by mining companies, on the back of rising commodity prices and the apparent prospect of a prolonged mining

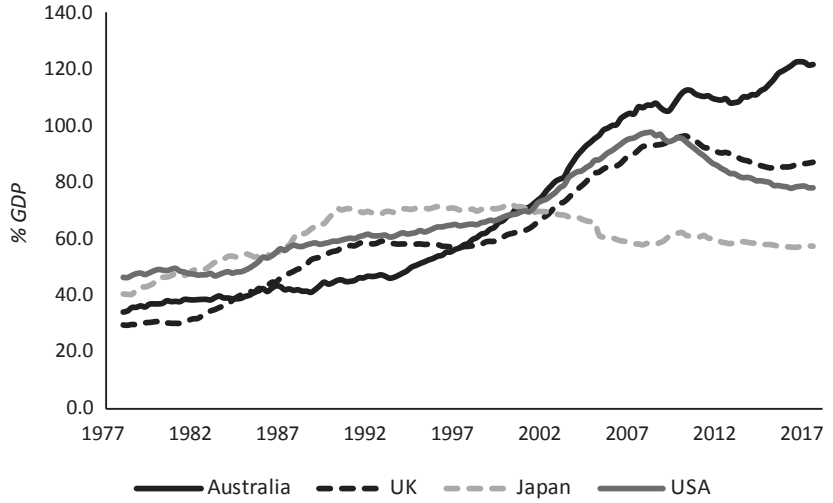

Fig. 6.1 Household debt-to-GDP ratios; Australia, Japan, UK and USA (*Source* BIS Data. Bank for International Settlements)

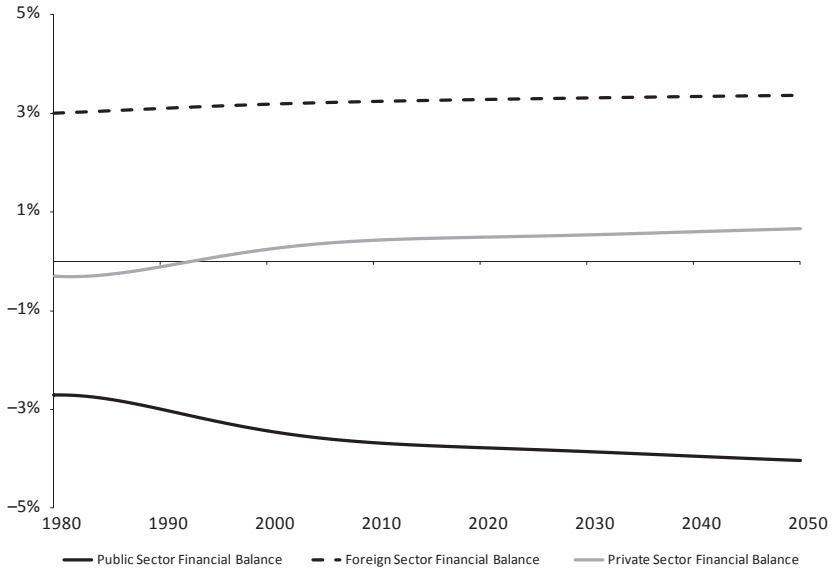

Fig. 6.2 3-Sector balances in the model, base case

boom. The rest of it, though, reflected household borrowing supported by a rising property market. These two effects can be separated out by dividing up the private sector into households, non-financial corporates (which of course includes the miners) and financial corporations (Fig. 6.2).

As I write, in early 2018, the Australian property bubble has not burst, and Australian household debt remains very high. There are concerns that as much as a third of this debt is held by households who do not have significant savings to draw upon and are vulnerable to financial distress, as a result of a rise in unemployment, in interest rates or in both.

Australia is a good example of the need to interpret sectoral balance sheet data with caution. Australian households overall are big net lenders on the financial system, alongside, not surprisingly, the foreign sector. The big net private borrowers are non-financial corporates, although it should be remembered that these data treat common stocks as financial liabilities, even though they are not technically debts of the companies

Table 6.2 Inter-sectoral net-lending and borrowing, Australia, June 2017

Australia net lending as at June 2017	*Households*	*Non-financial corporates*	*Financial corporates*	*Rest of the world*	*General government*	*Net-lending*	
From\to	*$Abn*	*$Abn*	*$Abn*	*$Abn*	*$Abn*	*$Abn*	*% of GDP*
Households	0	478	1621	96.4	410	2605.4	148
Non-financial corporates	−478	0	−964.7	−1025.2	−366	−2833.9	−161
Financial corporates	−1621	964.7	0	30.8	83.3	−542.2	−31
Rest of the world	−96.4	1025.2	−30.8	0	198.6	1096.6	62
General government	−410	366	−83.3	−198.6	0	−325.9	−19
Net borrowing	−2605.4	2833.9	542.2	−1096.6	325.9	0	0

Source Australian National Accounts. Australian Bureau of Statistics

concerned. The net financial liabilities of the Australian government are very modest, compared with those of the majority of other governments of high-income countries (Table 6.2).

What is lost in the aggregate is the fact that the much of the money saved by many Australian households over the past twenty years or so has been borrowed into existence by other households. Australian households overall have net financial assets of about 150% of Australia's GDP, to add to the real estate they own, but this obscures the fact that the gross debt of households, at about 125% of GDP, is nearly the highest in the world. The highest level of household inequality in almost 70 years means that many household balance sheets are fragile, despite the fact that the household sector overall has a strong net asset position. A greater net issuance of liabilities by the monetary sovereign government, alongside lower inequality, would allow for lower household debt. A comparison of the ratio of household debt to GDP in Australia, with the levels in the USA, the UK and Japan; and a comparison of the current figure with its value of about 50% in the mid-1990s, prior to its considerable increase during the years of the Howard government, reveal a financial fragility which is easily obscured by the data on intersectoral net lending (Fig. 6.3).

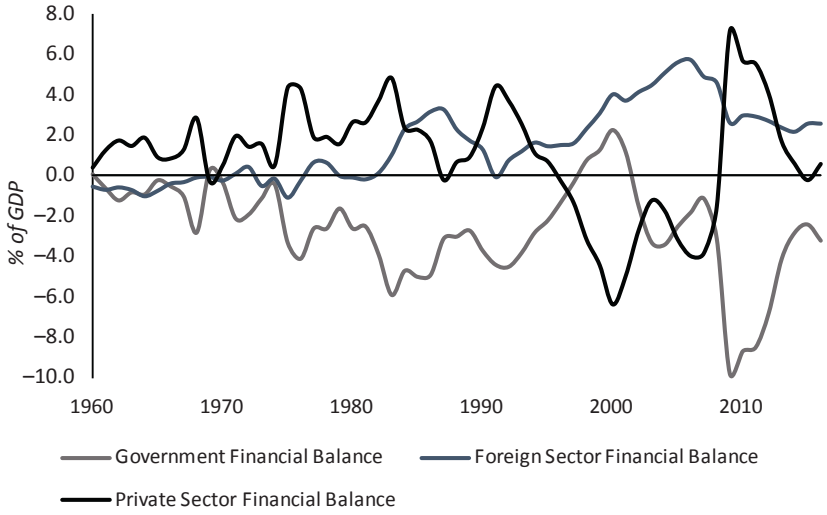

Fig. 6.3 US 3-Sector financial balances (*Source* Office of Management and Budget Historical Tables; Federal Reserve Economic Data, Federal Reserve Bank of St. Louis)

The net lending figures are balance sheet data. They are stocks, recorded at a moment in time, at the end of June 2017. The sectoral financial balances relate to transaction flows, happening over time. Along with asset revaluations, they change sectoral balance sheets, from one year to the next. A hard, monetary model of the economy must include balance sheet data and transactions flow data, based on correct accounting relationships, as well as a set of equations describing the determinants of key economic variables over time, describing those transaction flows and changes in asset prices and tracking the evolution of the interlocking balance sheets which are implied by the data.

Stock-Flow Consistent Monetary Models

Godley's stock-flow consistent models meet this requirement, incorporating three main elements—interconnected sectoral balance sheets; transactions matrices, which identify intersectoral financial flows and imply changes in sectoral balance sheets over time; and a set of consistent behavioural equations and identities driving the transactions matrix and indirect changes in balance sheet variables over time.[5]

It is businesses and not households which are at the centre of these models, just as they are at the centre of the model in Chapter 3 of Keynes' *General Theory*. Businesses make employment decisions, based on expected sales, in an uncertain environment. Pricing decisions incorporate a markup over normal unit costs, which must be sufficient to generate entrepreneurial profits high enough to meet the obligations set up by past financing decisions, as well as to generate retained earnings sufficient to fund future desired investment in a way consistent with the norm for business capital structure. Unemployment and underemployment are, by implication, involuntary and attributable to a lack of expected sales. As in *The General Theory*, there is no mechanism whereby flexible wages and prices can deliver full employment when there is insufficient aggregate demand.

Households make consumption and savings decisions based on anticipated disposable incomes and their wealth. They then allocate their savings between various financial assets, including deposits, bills, bonds and equities. These financial assets include bank deposits ('inside money') and stocks, which are not net assets for the private sector as a whole, and cash (alongside bank reserves, a form of 'outside money') plus government securities, which are net financial wealth for the private sector. The role of government securities and government (outside) money in determining private-sector financial wealth is of crucial importance in stock-flow consistent models and of course is fundamental to modern monetary theory.

In more sophisticated models, households also borrow from banks and can be modelled as engaging in speculative purchases of both financial and real assets. This allows unsustainable speculative bubbles to be modelled in this framework, and a broadly realistic financial system is a natural fit within the models. Banks react passively to a demand for loan finance. They set loan interest rates based on a markup over deposit rates, given a target for retained earnings, which itself is driven by the need to maintain an adequate capital adequacy ratio (a requirement similar to the first version of the Basel regulations fits easily into the model) and to allow for expected non-performing loans.

The government makes decisions relating to pure government expenditures (government purchases) and the tax rate, which play a key role in driving effective demand and which are critical to the achievement and maintenance of full employment. Fiscal policy drives the demand side of these demand determined but supply constrained models. Indeed, in the long run, there is no alternative but to rely on fiscal policy for this purpose, since what has become the monetary policy

convention of setting short-term interest rates to drive demand is easily shown to be ineffective in the long run (in both simple and more sophisticated stock-flow consistent models), due to their rigorous accounting for the impact of financing decisions on balance sheets and with reference to our recent historical and ongoing macroeconomic experience.

The central bank deals in government bills as required to hold the rate of interest on bills at its desired level. The official interest rate in the Godley and Lavoie models is the short-term bill rate, and the central bank uses its balance sheet for the purposes of interest rate maintenance. The models make clear that a monetary sovereign government is always able to purchase what is for sale in its currency and, like its central bank, can never become insolvent. Central bank and central government net financial worth are not constraints on fiscal policy. The issuance of government securities is about meeting the private-sector demand for them and managing interest rates. Another lesson from the Godley and Lavoie models, which benefit from the logical correctness of rigorous accounting, is that the central bank can, if it is prepared to use its balance sheet for the purpose, control the whole term structure of interest rates. This has been demonstrated in recent years by the Bank of Japan and a number of other central banks.

In their more sophisticated models, Godley and Lavoie model inflation using an amended version of the Phillips Curve, with a horizontal segment, which means that a wide variety of levels of employment are consistent with a stable inflation rate.[6] They justify this with references to some of the many empirical studies which have provided support for this approach. I will refer to the same model of inflation in Chapter 7 when I discuss the virtues of a job guarantee. They describe inflation as a conflicting claims process, with money wages determined in the labour market, but with real wages determined in the goods market, based on normal unit cost plus pricing and a markup which reflects the need to justify past financing decisions and to contribute retained earnings towards current investment financing.

Their models are simulation models, based on correct accounting—models of what might possibly happen and not precise predictions of what will happen. The importance of the Godley and Lavoie method is that it allows their use to describe what *cannot* happen, and often the advice and forecasts of New Keynesian economists have been based in recent years on long-term projections which are simply inconsistent with what is possible, given a correct accounting for stocks and flows. Godley was able to explain that the growth and fiscal surpluses of the Clinton administration in the late 1990s were unsustainable, due to their

implications for US private-sector balance sheets. Godley and Lavoie constructed a three-country stock-flow consistent model, where two of the countries shared a common currency, which floated against the currency of the third country, which described with extraordinary accuracy the vulnerability of the Eurozone to a financial crisis, well before the crisis actually struck. Godley spotted the fatal flaw of the design of the Eurozone at its very inception in the early 1990s. I regularly show the Godley and Lavoie three-country model to advanced students, knowing they will be amazed by is predictions, given that those students have been schooled in dynamic stochastic general equilibrium models completely unsuited to identifying such vulnerabilities.[1]

A Simulation Model

While Godley and Lavoie-style models lack the dense mathematics and calculus of those orthodox DSGE models which they should replace, they do involve a certain amount of algebra and technicalities which I do not wish to include in the main body of this text. They can extend to well over 100 equations. The Godley-inspired dynamic model of financial balances for the UK, published as a Bank of England Working Paper in 2016, has 80 equations, despite its limited scope. The model I am going to use, which is inspired by a well-known compact stock-flow consistent growth model of Marc Lavoie and Wynne Godley, has fewer than half that number, but the equations themselves are still best left to the appendix to this chapter. Those who are interested in the equations of the model can find them there: those who are not can avoid them.

What I want to do in the main body of the chapter is to explain the balance sheet and transactions flow matrices of the model and provide the results of at least one of the many policy experiments which the model allows you to carry out. This policy simulation demonstrates a fundamental problem with using monetary policy as the main tool of demand management; the superiority of fiscal policy, in a stock-flow consistent framework with correct accounting; and consequently, given the insuperable difficulties of precise discretionary financial fine-tuning in an uncertain environment with policy lags, the need for a job guarantee to set the full employment fiscal balance and act as an automatic counter-cyclical stabiliser.

The model adds a government sector, profit-making banks with a target capital adequacy ratio, household debt, capital asset depreciation and trade and current account balances to the model in Godley and

Lavoie's 2001 paper, *Kaleckian Models of Growth in a Coherent Stock-Flow Monetary Framework: A Kaldorian View*, which itself is a model of a closed economy without government.

However, the aim is to keep our model almost as small and compact as the one which inspired it, so the rest of the world is not modelled (instead, the country is assumed to run a trade deficit set as an arbitrary proportion of private-sector spending); there is no inflation in this model (to abstract from the need to model inflation and to distinguish between real and nominal values); and there are no changes in the level of inventories (production is assumed to equal demand in each time period). In addition, this model does not include real estate, so that the only speculative asset in which household wealth can be held is equities. All this keeps the number of equations below 40, instead of well over 100 or possibly 200. None of these simplifying assumptions affect the validity of the model for our purposes, and the simulation to be discussed procures similar results in more complicated, more realistic, stock-flow consistent models.

The model also consolidates the central bank into the government sector, which I have argued is for our purposes a useful thing to do, and includes only one form of government liabilities. These could be referred to as 'government money' or 'outside money' or 'treasury bills'. For our purposes, I will just refer to them as bills. Government net spending, in the model, involves the emission of additional bills. These bills are held by the foreign sector and by the banking sector. The banking sector holds whatever 'bills' the combined government and central bank chooses to spend into existence which are not held by the foreign sector. In this sense, bills in this model are equivalent to federal funds, or exchange settlement balances, in the real world. The interest rate on bills is set by the government/central bank. This can be thought of as the official interest rate in this model.

By assumption, the rate of interest paid on bank deposits in the model is equal to the rate of interest on bills. Households do not hold bills directly, and this is a cash-free economy, so household wealth—excluding capital reserves tied up in banks—is divided up between bank deposits and stocks. Banks do not issue stocks and can be interpreted as having the form of mutual organisations or private limited companies. Only households hold bank deposits, so that the business sector is assumed to spend financial resources, as it raises them, through retained earnings,

new stock issues and borrowing. None of this is essential to the results. It just keeps the number of equations manageable.

The correct accounting of the model is such as to make the demand for bank deposits by households equal to the supply of those deposits from the banking sector at every stage, without the need to include an equation in the model specifying that this is the case. This is just the consequence of the correct accounting for financial assets and liabilities in the model.

The balance sheet for the model is given in Table 6.3.

Financial assets are positives and financial liabilities are negatives, with notation as follows.

B = net government sector liabilities at issue
B_b = net government liabilities held by banks
B_o = net government liabilities held by the overseas sector
D_d = bank deposits held by households
D_s = bank deposits created by banks
L = total advances by banks to firms and households
L_h = household debt
L_f = firm debt (where 'firms' refers to the non-financial business sector)
P_e = price of stocks
e_s = quantity of stocks issued
e_d = quantity of stocks held by households
K = fixed capital stock (real assets)

Household net worth is defined here to exclude bank reserves, so that the net assets (or equity capital) of banks are recorded as bank net worth. The net worth of firms is the value of the capital stock, net of the market

Table 6.3 Balance sheet for the simulation model

	Households	*Firms*	*Banks*	*Government*	*Rest of the world*	Σ
Government bills			$+B_b$	$-B$	$+B_o$	0
Bank deposits	$+D_d$		$-D_s$			0
Bank advances	$-L_h$	$-L_f$	$+L$			0
Equities	$+p \cdot e_d$	$-p \cdot e_s$				0
Capital		$+K$				$+K$
Net worth	$D_d + p_e \cdot e_d - L_h$	$K - p_e \cdot e_s - L_f$	$L + B_b - D_s$	$-B$	$+B_o$	$+K$

value of the firm's stocks and their debt—this can be positive or negative, depending on whether the market value of corporate stocks is less than or more than the difference between the value of firms' assets and their debts (excluding the value of stocks issued), but has no direct significance in the model. There is no assumption that the stock market is informationally efficient, or that ratio of the market value of stocks to the net value of firm assets will tend towards 1 over time. Government net worth is equal to the net emission of government liabilities. The rest of the world has a positive figure for net worth, equal to the negative net international investment position of this country, due to a history of net inflows on the capital and financial account and consequent current account deficits.

Since every financial asset is also a financial liability, the net worth of the economy overall to all sectors must be equal to the value of the real assets which make up the capital stock, K. It would of course be better to incorporate ecological resources into the real resources which constitute the wealth and productive capacity of the economy, but that is not the purpose of this particular model. Ecological economists nonetheless do build Godley and Lavoie-style models, and the stock-flow approach lends itself to accounting for the ecological impact of economic activity.

The transactions matrix, which is essential to the model, as the values in this matrix each year drive changes in the balance sheet over time, looks far more complicated (Table 6.4).

Net sources of funds are positives, and net uses are negatives. Every row must sum to zero, since every $1 of funds available for use has come from somewhere in the system. For example, in the first row, the consumer spending which is a source of funds for firms is a use of funds for households.

Every column must sum to zero, since each $1 available for use in a sector has been used to make payments or acquire assets. For example, the sources of funds for households include their wages (WB), plus dividends from firms (FD) and banks (FDB), plus interest received on deposits ($r_{-1} . D_{-1n}$), plus new borrowing from banks (ΔL_{h}). They use these funds to pay taxes (T), for consumption (C), to pay interest on their existing loans from banks ($r_{\mathrm{l}-1} . L_{\mathrm{h}-1}$), to acquire new equities ($p_{\mathrm{e}} \Delta e$) or (as a residual) to acquire additional bank deposits (ΔD).

It is convenient here to separate out current and capital decisions, for both firms and banks. In the case of banks, this allows for us to distinguish between the determinants of bank profits and the division of those

Table 6.4 Transactions-flow matrix for the simulation model

	Households	*Firms*		*Banks*		*Government*	*Rest of the world*	Σ
		Current	*Capital*	*Current*	*Capital*			
Consumption	$-C$	$+C$						0
Investment		$+I$	$-I$					0
Pure government spending		$+G$				$-G$		0
Net exports		+NX					−NX	0
Wages	+WB	−WB						0
Net profits	+FD	$-F$	+FU					0
Bank earnings	+FDB			−FB	$+\Delta R$			0
Taxation	$-T$					$+T$		0
Interest on advances	$-r_{l-1} \cdot L_{h-1}$	$-r_{l-1} \cdot L_{f-1}$		$+r_{l-1} \cdot L_{-1}$				0
Interest on deposits	$+r_{-1} \cdot D_{-1}$			$-r_{-1} \cdot D_{-1}$				0
Interest on govt net liabilities				$+r_{-1} \cdot B_{b-1}$		$-r_{-1} \cdot B_{-1}$	$+r_{-1} \cdot B_{o-1}$	0
Δ Loans	$+\Delta L_h$		$+\Delta L_f$		$-\Delta L$			0
Δ Bank deposits	$-\Delta D$				$+\Delta D$			0
Δ Government net liabilities					$-\Delta B_b$	$+\Delta B$	$-\Delta B_o$	0
Δ Equities at issue	$-p_e \cdot \Delta e$		$+p_e \cdot \Delta e$					0
Σ	0	0	0	0	0	0	0	0

profits between additions to capital reserves and dividend payments to households, who own the banks. Bank earnings (FB) are used as a source of capital reserves towards a target for the capital-to-asset ratio (ΔR), and the rest are paid out in bank dividends to households (FDB).

In the case of firms, the current column reminds us that the elements in GDP include consumption (C), investment (I), government spending excluding interest payments (G) and net exports (NX), and that these proceeds for firms can be divided up in this model into the wage bill (WB), interest payments to banks ($r_{l-1} . L_{f-1}$) and net profits. The net profit row of the table shows how these profits are divided up between dividends to households (FD) and retained earnings (FU). The capital column shows how investment (I) is funded, partly from these retained earnings (FU), but also partly from new stock issues to households ($p_e \Delta e$), with the rest coming from net borrowing from banks (ΔL_h). Sources of funds are positives and uses of funds are negatives. Since all funds used must have come from somewhere, each column sums to zero. Since each transaction has two parties to it, each row also sums to zero.

Table 6.5 reproduces the above transactions-flow matrix incorporating the values from the 'Year 2000' in the simulation model we are about to employ for a policy experiment in '2001'.

The parameters of the equations and the values of the policy variables have been chosen to create a simulated economy sharing the normal characteristics of an economy which is running a current account deficit with the rest of the world, with a level of household debt similar to that of Australian in the 1990s. They are provided, along with the identities and behavioural equations themselves, in the appendix to the chapter.

The intersectoral financial flows in the base case look like this—the tranquillity within the model, where parameters and policy variables are held constant, as compared with the real world, is clearly shown from a quick comparison of Fig. 6.4 with Figs. 6.1 and 6.2.

The foreign sector chooses to run a financial surplus in the financial system of this economy, which explains the current account deficit. Households in aggregate are choosing to net save over time, as they have a long-run target stock-flow ratio of net financial assets held to income, and the national income of this economy is growing over time. Financial institutions are in surplus in the model, as they are retaining profits to maintain their minimum capital adequacy ratio requirements. One of the two deficit sectors is non-financial corporations, which are investing in excess

Table 6.5 Transactions-flow matrix for the simulation model; year 2000 values

	Households	*Firms*		*Banks*		*Government*	*Rest of the world*	Σ
		Current	*Capital*	*Current*	*Capital*			
Consumption	−7408.46	+7408.46						0.0
Investment		+2712.40	−2712.40					0.0
Pure government spending		+1662.76				−1662.76		0.0
Net exports		−202.42					+202.42	0.0
Wages	+7018.91	−7018.91						0.0
Net profits	+1999.35	−4166.33	+2166.98					0.0
Bank earnings	+309.09			−413.31	+104.22			0.0
Taxation	−1464.11					+1464.11		0.0
Interest on advances	−326.48	−395.96		+722.44				0.0
Interest on deposits	+277.81			−277.81				0.0
Interest on govt net liabilities				−31.32		−114.36	+145.68	0.0
Δ Loans	+322.52		+392.99		−715.51			0.0
Δ Bank deposits	−576.20				+576.20			0.0
Δ Government net liabilities					+35.09	+313.01	−348.10	0.0
Δ Equities at issue	−152.43		+ 152.43					0.0
Σ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0

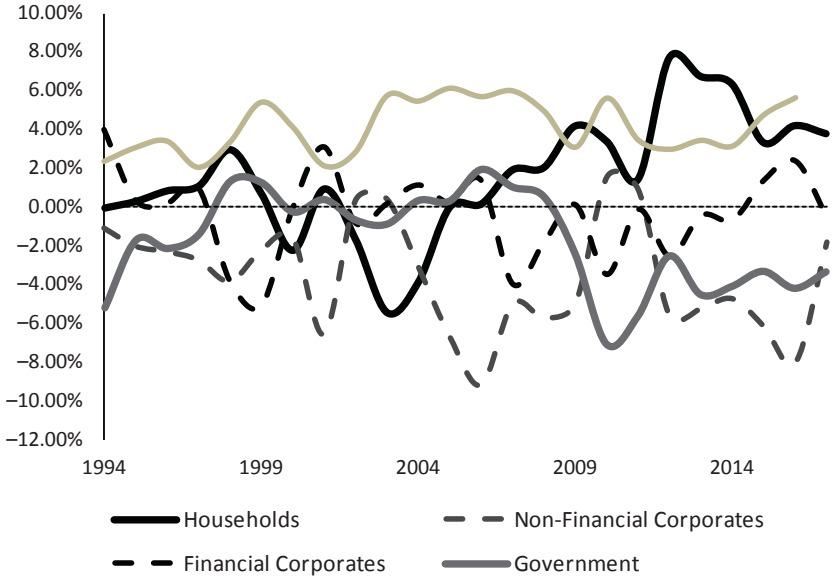

Fig. 6.4 Australia 5-Sector financial balances (*Source* Australian National Accounts. Australian Bureau of Statistics)

of their retained earnings, and so issuing additional stocks and borrowing from banks. The private sector as a whole is in net surplus from the late 1990s onwards, in the base case—unlike what was the case in Australia. The remaining deficit sector is the government sector, which is supplying net financial assets to the other sectors, while maintaining aggregate demand at a level consistent with the sustainable growth of real GDP and the maintenance of something close to full employment. The private and government balances are approaching steady states, in the base case, but have not yet reached those steady states. Such steady states are best interpreted in the same way as long-period equilibria in Post-Keynesian models—points of attraction that are not in practice attained, because of frequent changes in the parameters of the model, or in policy settings.

A Policy Experiment

As an experiment, I introduced a temporary cut in the rate of growth of pure government spending, carried out in 2001, matched with a reduction in the official interest rate easily large enough to offset the impact

of this fiscal tightening on GDP. The simulation model is set up to provide the most optimistic initial results from cutting interest rates, with a household sector propensity to consume which depends on the rate of interest, plus external debt to the rest of the world greater than government net financial liabilities, so that the balance is made up for by the domestic banking system being in debt to the government. This means that, initially at least, a cut in interest rates not only raises the marginal propensity to consume out of income, but also reduces interest payments being made by domestic banks to the government, and moreover reduces interest payments being made by the government to the rest of the world.

A cut in government spending in 2001, relative to what had been planned, of 2%, does not require a reduction in nominal government spending at all. Instead, given an assumed trend increase in government spending of 4% per annum, government spending increases in 2001 by just under 2%. This is of course not 2% of GDP—it is slightly below 0.3% of GDP in the model. Subsequently, the growth rate in government spending returns to its initial level, so that the fiscal contraction might be seen as temporary and moderate, and barely a contraction at all.

The authorities combine this slight and temporary fiscal tightening with a large and permanent monetary stimulus, adopting a zero interest rate policy in 2001, in a loose monetary/tighter fiscal policy mix. An apparently mild fiscal tightening (government spending is after all still rising, but just at temporarily lower rate) and a drop in the official interest rate all the way to zero might be expected to have a persistently significant positive effect on GDP (Fig. 6.5).

It is unsurprising that, given the circumstances of the model in 2001, this policy mix has a cumulative stimulative impact on demand and GDP over the subsequent decade or so. However, even with parameters selected so that this cut in interest rates has a big impact on the marginal propensity to consume out of income, the positive impact of the policy mix on demand is temporary. Before 20 years have gone by in the model, the net impact has been reversed and has become significantly negative. This would have happened much sooner if the model base case had in 2000 had the government being in debt to the domestic private sector, rather than the other way around. It would also have happened much sooner if the fiscal contraction had been more significant or of a longer duration. That it happens at all is due to an eventual reduction in household wealth. The long-run inefficacy of an expansionary monetary

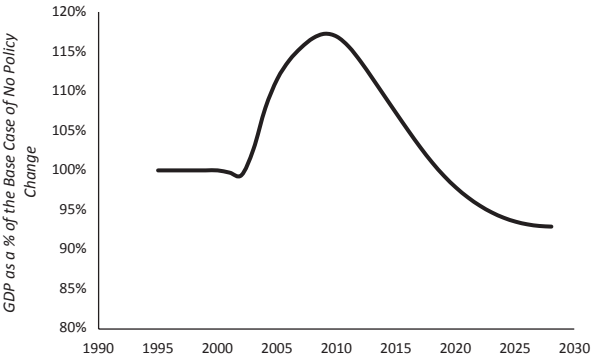

Fig. 6.5 One-off reduction in rate of growth of *G* in 2001, combined with a permanent cut in the 'Cash Rate' from 2% to 0%. Impact on GDP relative to base case

policy is due to the impact of the flows of spending and borrowing it encourages on the stocks of household wealth and private debt.

The significant point is that, even when a stock-flow consistent model is set up to provide the most favourable possible circumstances for a reduction in interest rates, or other purely monetary policy mechanism such as deregulating credit, to stimulate growth in aggregate demand relative to trend, any such effect is temporary. The introduction of speculative bubbles, and growing Minskian instability in the accumulation of private debt, can extend the period of the stimulus, but not permanently, and at the cost of a subsequent crash. Australia is a country living with the consequences of such a policy mix now.

The potential for rising private indebtedness to drive instability and a financial crisis in this way has been explored by the Australian economist, Steve Keen, using a mathematical model, named after Minsky (Keen 2011). Keen's Minsky model builds a financial sector onto Goodwin's limit cycle model of the economy. In Goodwin's model, the state of the economy drives the distribution of income between labour and capital, which in turn drives the rate of capital accumulation and economic growth, with the consequence being expansions leading to unsustainable increases in the wage share, and recessions driving the wage share down again. Keen's model adds a financial sector, which gradually increases its share of the national product as private debt accelerates, until it has sucked so much income out of the other two sectors that the financial system is forced to crash. What is missing from this story, of course, is a monetary

sovereign government and fiscal policy. A monetary sovereign government always has the means to forestall such a crash, should it choose to do so.

Monetary policy alone cannot deliver a permanently higher level of aggregate demand, and therefore of output and employment, in an economy with involuntary unemployment. It can at best have a temporary impact, and that impact is at the potential cost of growing financial instability and speculative bubbles in asset markets. Since the economy is a modern monetary system, and not a Barro-Ricardian general equilibrium one, an appropriate use of fiscal policy and the emission of net financial liabilities by monetary sovereign governments, which cannot become insolvent in their own currencies, are key to non-inflationary full employment.

Suppose that the government wishes to reduce the unemployment rate to 1%, or perhaps to 2%, which after all was the rate of unemployment in Australia for most of the 1950s and 1960s, and to hold it there. Suppose that to do this the government uses a simple fiscal rule, which is to amend the growth rate of pure government spending over time in proportion to the gap between prior-year unemployment and its target for the unemployment rate.

This fiscal rule in the model in the appendix might be written as

$$G = G_{-1}\left(1 + g_g\left[1 + \omega\left(U_{-1} - U^*\right)\right]\right), \qquad \text{(A25*)}$$

where ω could be informed by a fully developed stock-flow consistent macroeconomic model, but would also depend on the rate at which the government wished to close any unemployment gap and on perceived inflation risks, and U^* could be set at 1%, given the existence of short-term frictional unemployment.

In the model, a fiscal rule of this type reduces the unemployment rate towards the desired level. It does so by mildly increasing the rate of growth of GDP above the rate of growth of the labour force and productivity growth, until the unemployment rate has been brought down to the government's target. Partly for reasons discussed in Chapter 5, when I addressed the orthodox view on fiscal sustainability, there are no significant implications for the government debt ratio, and of course, this is in any case irrelevant to a monetary sovereign government. Fiscal expansion is an effective means for a monetary sovereign to achieve tight full employment. The ideal is to do this quickly and without an inflation barrier preventing tight full employment from being achieved. This requires the institution of a job guarantee, as will be discussed in the next chapter.

There are many other experiments which can be performed using a model such as this one. It can not only demonstrate the ability of fiscal policy to deliver and sustain full employment; the long-run instability of monetary policy to achieve the same outcome; and the validity of the axioms of modern monetary theory. It can also demonstrate that a tendency for increasing inequality, and a shift in national income from wages to profits, to generate increasing financial fragility and/or rising unemployment can be offset through appropriate fiscal policy. Government net spending can always deliver sufficient demand in the economy to maintain the economy at its full employment level.

That is not to say that excessive inequality is not a symptom of an unhealthy, failing society, which does not need to be addressed. It is also not to say that the rise in Kalecki's degree of monopoly, and the shift in income from labour to capital, which has been allowed to happen over the last 30–40 years in the USA and elsewhere, does not have to be reversed. It is instead to say that full employment can come first and can facilitate that shift, rather than inequality being a barrier to the achievement of full employment.

I am also not arguing for an excessive reliance on a simple fiscal rule, such as that described above, to set the fiscal balance. Such a rule can play a role in fiscal management, but given the complexity and uncertainty of the economic system, policy lags and the tendency for government spending for pump priming purposes to benefit those who need help least, and to be inflationary, a job guarantee must play a major role in ensuring sustainable full employment. The role of a job guarantee as a bottom-up approach to setting the fiscal balance is yet to be discussed.

Returning to the intersectoral balances equation, and reminding ourselves that the spending and savings decisions of the domestic private sector and the foreign sector are outside the control of the government, this makes the full employment fiscal balance endogenous. It means no specific target for the fiscal balance, maintained over time and set without reference to the behaviour of the other two sectors of the economy, makes any sense at all. For countries with approximately balanced trade with the rest of the world, and a private sector with a desire to net save at full employment, the government must run sufficiently high fiscal deficits, or full employment will neither be achieved nor maintained.

Monetary policy and financial deregulation might encourage many households to go far into debt, and that might drive the private-sector financial balance temporarily into a significant deficit, as in Australia in

the 1990s and 2000s, and this might facilitate real GDP and employment growth for a while, but it is not sustainable. Rising private debts produce fragile private balance sheets and an increasingly fragile and crisis-prone financial system. It is not a recipe for sustainable prosperity. Sustainable prosperity requires monetary sovereign governments to use their fiscal space to run large enough fiscal deficits to generate full employment and progressive economic development. The barrier is inflation: it is not purely financial. Political organisations and institutions like the European Union, which advocate for, or implement and maintain, fiscal frameworks based on balanced budgets and associated fiscal rules, have been misled by a wrong model of the economy and are responsible for unnecessary unemployment and poverty.

In the words of Wynne Godley and Marc Lavoie, 'It necessarily follows that the steady state budget deficit is determined by private net saving, rather than the other way round, and that the budget balance must normally be in deficit. This is in accordance (or at least consistent) with one of Minsky's major contentions, but it is quite inconsistent with the ignorant assumption often made by politicians that the budget balance should be zero; it is also inconsistent with the Maastricht fiscal rules'.[7]

Notes

1. As in Godley (1999), which showed that the Clinton fiscal surpluses were unsustainable, given the economic circumstances of the USA; Godley and Zezza (2006), which predated and predicted the financial crisis so many orthodox economists claimed was impossible to foresee; and Godley and Lavoie (2006), which demonstrated the fatal weakness of the Eurozone system, without a central bank which was prepared to support government bond markets.
2. See Nikiforos and Zezza (2017), for a recent survey of the stock-flow consistent literature.
3. Godley was influenced by Nicholas Kaldor, more than any by of his other colleagues at Cambridge, and cites a Damascene moment in 1974, arising out of a conversation with Kaldor, regarding the significant of the sectoral balances equation, in the *Preface* of Godley and Lavoie (2006).
4. This quotation, reported by Joan Robinson in a paper published in 1982, is the epigram on the first page of Godley and Lavoie (2006).
5. Another explanation of stock-flow consistent modelling, more faithful to the social accounting matrix approach as developed by Richard Stone, but in my opinion as a result a little harder to follow than Godley and Lavoie, is provided

as the first chapter of the Lance Taylor's highly technical *Reconstructing Macroeconomics: Structuralist Proposals and Critiques of the Mainstream* (2004).

6. For example, the growth model in Chapter 11 of Godley and Lavoie (2006).
7. Godley and Lavoie (2006, 444).

Appendix

The Simulation Model

We start with the national income accounting identity for GDP.

$$Y = C + I + G + \mathrm{NX}. \tag{A1}$$

Non-financial sector firm profits before interest (EBIT) are given by (A2)

$$\mathrm{EBIT} = \frac{\mu}{1+\mu} * Y. \tag{A2}$$

The parameter μ is Kalecki's gross markup over direct costs, which in this model are entirely labour costs.

$$\mathrm{WB} = Y - \mathrm{EBIT}. \tag{A3}$$

The wage bill is that part of GDP which is not EBIT, so that $Y = \mathrm{EBIT} + \mathrm{WB}$.. Banking sector services do not directly make up a part of GDP in this model, and bank earnings are instead treated as a transfer, and a use to which a part of GDP is put.

$$\mathrm{NX} = -\psi \,.\, (C + I). \tag{A4}$$

This country is assumed to be running a trade and current account deficit, since the country is in receipt of net capital inflows, driving the real exchange rate to a level at which the trade balance is in deficit. Given the dominance of financial flows in the determination of floating exchange rates in the modern world—where the turnover of the foreign exchange market in recent times has been approximately 100 times the value of trade flows (BIS 2013)—the capital and financial account is viewed as the primary cause of the trade balance being in deficit. In the model, the trade deficit is a proportion of private-sector spending, where the proportion is a parameter. This assumption is made to keep the model compact.

$$I = \delta \,.\, K_{-1} + g_k K_{-1}. \tag{A5}$$

Gross investment spending is the sum of replacement investment and net investment. Replacement investment is a fixed proportion of the previous period's value of the capital stock, where that proportion δ is a parameter. Net investment is again a proportion of the prior capital stock, but the rate of accumulation coefficient g_k is given by an equation, similar to the Kalecki–Steindl–Keynes–Minsky equation used in Lavoie and Godley.

$$g_k = a_0 + a_1\left(u_{-1} - u^*\right) + a_2\left(\frac{\mathrm{FU}_{-1}}{K_{-1}}\right) + a_3\left(q_{-1} - q^*\right). \qquad \text{(A6)}$$

I have omitted the rate of interest on loans from this equation, although the rate of interest will still influence the rate of accumulation, though its direct impact earnings net of interest, and through its impact on the propensity to consume and on household wealth.

u_{-1} is to the utilisation ratio of the previous period.

$$u = Y/Y_{\mathrm{cap}}\,, \qquad \text{(A7)}$$

$$Y_{\mathrm{cap}} = K_{-1}/\mathrm{COR}\,. \qquad \text{(A8)}$$

a_0, a_1, a_2 and a_3 are all parameters in the model, as is the capital output ratio, COR.

q_{-1} is the valuation ratio for the previous period.

$$q = \frac{p_{\mathrm{e}} \,.\, e}{K - L_{\mathrm{f}}}\,. \qquad \text{(A9)}$$

The higher the utilisation ratio and the stock market valuation ratio, the higher the rate of capital accumulation. Though a utilisation ratio of 70% and valuation ratio of 100% are included in the equation, this does not mean there is any tendency in the model towards a steady state at either (or both) of these benchmarks.

The consumption function is as follows:

$$C = \alpha_1 Y_{\mathrm{r}\,-1}(1-\theta) + \alpha_1 \Delta L_{\mathrm{h}-1} + \alpha_2 V_{-1} - \alpha_1 r_{\mathrm{l}-1} L_{\mathrm{h}-1}\,. \qquad \text{(A10)}$$

Household consumption depends on the previous period's after-tax regular income, on the net additional loans household took out last period, on household wealth in the previous period and on the interest households have to pay on their existing debts. Consumption perhaps

ought to depend on expected values of regular income and wealth this period, but it is in the nature of these models that such a change does not make a significant difference to the operation of the model over time.

The marginal propensity to consume out of regular income depends on the lagged rate of interest on loans:

$$\alpha_1 = \alpha_{10} + \alpha_{11} r_{l-1} \,. \tag{A11}$$

Gross regular income includes wage income, interest received on deposits, dividends from firms and dividends from banks:

$$Y_r = \mathrm{WB} + r_{-1} \cdot D_{-1} + \mathrm{FD} + \mathrm{FDB} \,. \tag{A12}$$

Household wealth (V) is the net worth of households, excluding bank reserves, and as identified in the balance sheet matrix:

$$V = D + p_e e - L_h \,. \tag{A13}$$

The rate of interest on loans is given by adding a bank profit margin onto the rate of interest on deposits (which by assumption is set at the rate of interest on bills here).

$$r_l = r + \pi_b \,. \tag{A14}$$

The official interest rate, or rate of interest on bills, is set at 2% in the base case, with a bank profit margin of 2%.

The amount of new household borrowing ΔL_h is assumed to depend on another measure of income—Haig–Simons income, Y_{hs}, which includes (after-tax) capital gains, but excludes debt interest payments.

$$Y_{hs} = Y_r (1 - \theta) + \mathrm{CG}\left(1 - \frac{\theta}{2}\right) - r_{l-1} L_{h-1} \,. \tag{A15}$$

CG denotes capital gains on shares, which are the only speculative asset in this model:

$$\mathrm{CG} = \Delta p_e \cdot e_{-1} \,. \tag{A16}$$

It is assumed that all capital gains are taxed, whether realised or not, but that they are taxed at a concessional rate of half the marginal tax rate on regular income. New household borrowing is then given as a proportion of any increase in Haig–Simons income over the period:

$$\Delta L_h = \zeta (Y_{hs} - Y_{hs-1}) \,. \tag{A17}$$

$\alpha_{10}, \alpha_{11}, \alpha_2, \theta, \pi_b$ and ζ are further values which need to be selected. θ is of course a key policy variable.

The distributed profits of firms are a proportion of the entrepreneurial earnings F of the previous period, which are themselves EBIT net of interest payments to banks, given that there are no taxes on corporate profit in this model. That proportion is the dividend payout ratio (POR), which is a further parameter:

$$F = \text{EBIT} - r_{l-1} L_{f-1}\,, \tag{A18}$$

$$\text{FD} = \text{POR} \cdot F_{-1}\,. \tag{A19}$$

Retained earnings are given as a residual by,

$$\text{FU} = F - \text{FD}\,. \tag{A20}$$

The proportion of planned investment to be funded through the issue of new shares depends on the lagged valuation ratio, so that the number of new shares issued in each period is given by,

$$\Delta e_s = \frac{\gamma q_{-1} I}{p_{e-1}}\,. \tag{A21}$$

The remaining source of funding for investment is additional borrowing by firms from the banking sector:

$$\Delta L_f = I - \text{FU} - p_{e\,-1} \Delta e\,. \tag{A22}$$

The only market-clearing price in the model is the price of an equity share. This is set by equating the supply of shares from (A21) with the demand for shares, to determine p. The proportion of the previous period's household wealth which is invested into the share market in this period is given by an equation similar to the Tobin 'pitfalls equation' used in Lavoie and Godley, except for the omission of a term relating to the transactions demand for money.

Rearranging the resulting equation for the household demand for shares to make the market-clearing price of shares the subject, we get,

$$p_e = \{\lambda_0 - \lambda_1 r_{-1} + \lambda_2 r_{e-1}\} V_{-1}/e\,. \tag{A23}$$

Household demand for shares, and therefore the market-clearing price of shares, since the supply this period has already been determined, depends negatively on the lagged return on bank deposits and positively on the lagged return on equities. The λ_i terms are further parameters.

The return on equities is the simple sum of the dividend yield plus capital gain. In gross terms, this gives us,

$$r_e = \frac{\text{FD} + \text{CG}}{p_{-1}e_{-1}}. \tag{A24*}$$

(* in the simulation model as used, FD was adjusted using the marginal income tax rate and CG using the concessional tax rate for capital gains)

It is government spending which drives the sustainable rate of growth of demand in this model, and consequently which drives the growth in GDP. Pure government spending, net of interest payments on government financial liabilities, is taken to grow at some trend rate:

$$G = G_{-1}\left(1 + g_g\right), \tag{A25}$$

The growth rate in pure government spending is another parameter, which will be set at 4% in the base case of the model.

Taxation is given by,

$$T = \theta(Y_{\text{r}}) + (\theta/2)\text{CG}. \tag{A26}$$

The fiscal deficit is given by,

$$\Delta B = T - G - r_{-1}B_{-1}. \tag{A27}$$

Part of this reflects a demand for domestic financial assets on the part of the rest of the world, due to the current account deficit:

$$\Delta B_{\text{o}} = -(\text{CA}) = -(\text{TB}) + r_{-1}B_{\text{o}-1}. \tag{A28}$$

The rest is taken up by domestic banks. Government financial liabilities in this context equate to additional exchange settlement reserves or federal funds for the banking sector, so that there is no question of securities needing to be sold in a market to 'fund' the fiscal deficit. Banks must take up as settlement reserves whatever government financial liabilities are not taken up by other sectors, as in real life (in this model, the only other sector to hold government liabilities directly is the overseas sector). Should insufficient net government liabilities be issued to meet the demand for them from the foreign sector, then banks go short in bills in this model, which equates to central bank lending to the banks at the official interest rate:

$$\Delta B_{\text{b}} = \Delta B - \Delta B_{\text{o}}. \tag{A29}$$

Distributed earnings from banks are given by bank earnings, less bank retained earnings:

$$\mathrm{FDB} = \mathrm{FB} - \Delta R\,. \tag{A30}$$

Bank earnings are given by the gap between interest received on assets and interest paid on liabilities:

$$\mathrm{FB} = r_{l-1}L_{f-1} + r_{l-1}L_{h-1} + r_{-1}B_{b-1} - r_{-1}D_{-1}\,. \tag{A31}$$

Bank retained earnings depend on the necessary increase in reserves to meet a lagged solvency ratio requirement, where SOLR is the required solvency ratio:

$$\Delta R = (\mathrm{SOLR} - \mathrm{SOL}) \cdot (L_{f-1} + L_{h-1})\,. \tag{A32}$$

The demand for deposits at banks is determined from the balance sheet of households as,

$$D_d = V + L_h - p \cdot e_d\,. \tag{A33}$$

The supply of deposits by banks comes from the balance sheet of banks and is,

$$D_s = L + B_b - R\,. \tag{A34}$$

The equation I have no need to write down is the identity between the demand for deposits on the part of households and their supply by banks ($D_d = D_s$). This identity is a consequence of correct accounting within the model and serves as a check that the model is correctly specified in terms of accounting for stock-flow relationships.

This is sufficient to determine the behaviour of this highly simplified, mechanical and non-stochastic monetary model. It has obvious limitations, but any attempt at a fully realistic model of this kind necessitates at least three times as many equations, and full realism is not the purpose here. The purpose is to design a model which can easily be reproduced on excel, with some institutional realism, which accounts correctly for stocks and flows, and within which a range of useful experiments can be carried out. The experiments are useful if they generate predictions which still hold approximately in much larger and more realistic models, and which are likely to apply in real life also, since they reflect the workings of a correct accounting for stocks and flows within the model.

Since the price level is held constant (at $P=1.65$), then any changes in labour productivity (APL) or the Kaleckian markup show up as changes in the (real) wage:

$$\frac{W}{P} = \frac{\text{APL}}{(1+\mu)}. \tag{A35}$$

Labour productivity is set at 1, the markup is 0.65, and therefore the nominal wage rate W is 1, in the base case.

Employment is given by the wage bill divided by the wage rate:

$$N = \frac{\text{WB}}{W}. \tag{A36}$$

The labour force grows over time, at some trend rate:

$$\text{LF} = \text{LF}_{-1}(1 + g_{\text{LF}}). \tag{A37}$$

In the base case, pure government spending grows in line with the sum of the growth rate of the labour force and the growth of labour productivity, with the growth in labour productivity set equal to zero.

The unemployment rate is given by 1, the ratio of employment to the labour force:

$$\text{UN} = 1 - \frac{N}{\text{LF}}. \tag{A38}$$

In the 'year 2000', the labour force consists of 7233 workers, and the unemployment rate is 2.96%.

The economy in the simple model looks like a very stable place, and as it stands there is no financial instability in this model, but Minskian financial instability; complexity and nonlinearities; and stochastic behaviour can easily be added. A model like this, and even far more complicated and realistic stock-flow consistent models, provides a canvas on which a variety of scenarios can be described. While almost fully realistic models, with parameters selected for consistency with econometric data, can be used as an aid to economic forecasting, that is not the most important function of these models. They can, at best, as Godley understood, make contingent predictions of possible future outcomes. The power of such models lies in their narrowing down the set of possible futures, to ones consistent with a plausible evolution of stocks and flows, based on correct accounting.

The values of the policy variables and parameters used in Model 7A, base case, were as follows:

$g_g = 0.04;\ \theta = 0.15;\ r = 0.02;\ \text{SOLR} = 0.15$

$\mu = 0.65;\ \psi = 0.02;\ \delta = 0.03;\ a_0 = 0.01;\ a_1 = 0.10;\ a_2 = 0.02;\ a_3 = 0.02;$

$u^* = 0.7;\ q^* = 1;\ = 3.5;\ \alpha_{10} = 0.9;\ \alpha_{11} = 4;\ \alpha_2 = 0.1;\ \pi_b = 0.02$

$\zeta = 1;\ \text{POR} = 0.5;\ \gamma = 0.1;\ \lambda_0 = 0.6;\ \lambda_1 = 0.02;\ \lambda_2 = 0.38;\ g_{LF} = 0.04$

$W = 1$ (the price level P is always fixed at 1 in this model); APL = 1

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CHAPTER 7

A Job Guarantee

We know for sure that unemployment has severe and long-lasting effects on the quality of life of the unemployed and their families, and imposes a variety of costs on the broader community.[1] To achieve sustainable prosperity, we must eliminate involuntary unemployment, and by doing so eliminate involuntary poverty, reduce income inequality, and create an economy where everyone has an opportunity to live and to contribute towards social provisioning, in security and dignity. This is a view shared by all modern monetary theorists, but not by orthodox economists, and not universally by those who describe themselves as social progressives.

The attitude orthodox economists have towards unemployment is strongly influenced by their commitment to the idea that while consumption is always good, work is always bad.[2] To them, people are consumption machines, who reluctantly give up their leisure time and engage in paid work to enjoy the benefits of increased consumption, when those benefits exceed the costs of supplying their labour. This is built into the utility functions of dynamic stochastic general equilibrium models. It is also where the concept of a natural rate of unemployment comes from. It is supposedly about people choosing not to work because they are not productive enough to make it worth their while to take employment, given that real wages, in their model, depend on productivity; or because the tax and benefits system damages incentives to work.

It is easy to be misled by this approach. Some would welcome a future where automation and artificial intelligence might lead to many people

S. Hail, *Economics for Sustainable Prosperity*,
Binzagr Institute for Sustainable Prosperity,
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being excluded from paid employment, on the basis that they can instead be provided with an unconditional income. This would after all mean they could still consume, but be excluded from the supposed drudgery of paid work. Those who welcome this vision for the future have the same view of what drives people's well-being as an orthodox economist. To imagine that the only significant cost of unemployment to an unemployed person and her family is a loss of income, and even that unemployment without a loss of income is necessarily a good thing, is to have been badly misled by soft economics.

Real people are not consumption machines, and unemployment harms people for reasons separate from losses in income. This is not to say that there are not people working under poor conditions and for low wages who would not choose to give up their terrible jobs if they had an alternative means of subsistence. It is to say rather that monetary sovereign governments ought to ensure these workers have the option of moving into a well-designed job guarantee programme, with good working conditions and a wage which allows for people to live in dignity, independence and security. The opportunity of purposeful, productive, socially respected paid employment is important for the subjective well-being and mental health of most adults of working age.

Unemployment, Inequality and Well-Being

Economists regularly oversimplify the costs of unemployment at a macroeconomic level too, and this is the case not only for those orthodox economists whose world view I have been challenging throughout this book, but also on occasion for modern monetary theorists. It is common to refer to Okun's Law, often written as the statement that a 1% increase in unemployment causes a 1.5% or 2% loss in real GDP. In an economy where the pursuit of full employment relies on the pursuit of growth, there is nothing wrong with Okun's Law. Where the maintenance of full employment requires demand to increase by enough to keep pace with increases in the labour force and in real GDP per worker, it is entirely valid. The problem comes when this loss in output is described as *the* social cost, or the best way of describing the social costs, of unemployment. This implies both that there are no other costs worth taking into consideration and that all increases in GDP are always and necessarily of social benefit.

In what are already high-income countries, there is no clear relationship between real GDP and people's well-being; there are social costs as well as social benefits from GDP growth; there is a much clearer, and clearly negative, relationship between economic inequality and well-being; the non-pecuniary costs of unemployment are highly significant; and a job guarantee can, over time, partially divorce full employment from real GDP growth, and by doing so help to contribute towards both ecological sustainability and increases in a more meaningful indicator of economic progress.

The measurement of well-being is necessarily subjective and prone to errors and biases. For example, the issue of whether it is valid to base a measure of well-being on the responses people give to questions relating to their happiness, or their overall life satisfaction, on some arbitrary scale, is not one which can be easily dismissed. However, such questions have been asked, to cross sections of populations in different countries, and to panels of individuals in particular countries, and have generated interesting results.

A well-known survey is the Gallop World Poll, which includes a question on life satisfaction based on the *Cantril Self-Anchoring Scale*.[3] Participants are asked to imagine a ladder with steps numbered from zero at the bottom to 10 at the top, where the top equates to the best possible life for the participant, and the bottom the worst possible life, and then asked which step they feel they are standing on at the moment. This approach is believed to encourage a more deliberative and less instinctive response to the question of how satisfied they are with their lives than just asking them how happy they feel themselves to be.

The following chart shows the relationship between reported life satisfaction and real GDP per person for 143 countries in 2016. Unsurprisingly, there is a correlation there, at least for countries up to about the income level of Spain. It is possible to fit a logarithmic curve to the entire data set, which suggests that the relationship covers the whole sample of countries, so that a given percentage increase in income per person continues to raise predicted life satisfaction by the same amount. If this was the case, then there would never come a point where additional income did not lead to an improvement in life satisfaction.

It is interesting to compare countries with roughly the same income per person, but very different levels of reported life satisfaction, such as Norway, the USA, Saudi Arabia and Hong Kong; or countries with approximately the same Cantril score but very different per capita

incomes, like Spain, Saudi Arabia and Qatar. These differences may be partly cultural, but can also be related to issues such as income distribution, political freedom and other factors.

Even if a given percentage increase in real GDP per person continues to raise life satisfaction in countries which are already rich, it is important that a 1% increase in income per person in an already high-income country involves the use of a far greater amount of ecological resources than is the case in a low-income country. Increasing the income of the median household in the Central African Republic by 10% hardly damages the planet at all, compared with doing the same thing for an American family (Fig. 7.1).

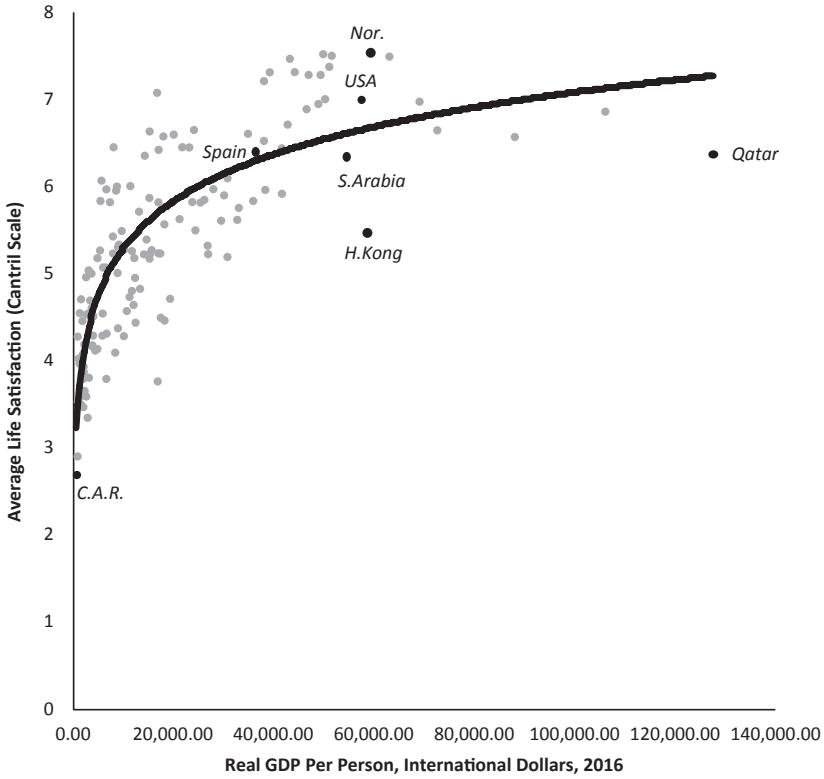

Fig. 7.1 Life satisfaction and real GDP per person, 143 countries (*Sources* Gallup; World Bank)

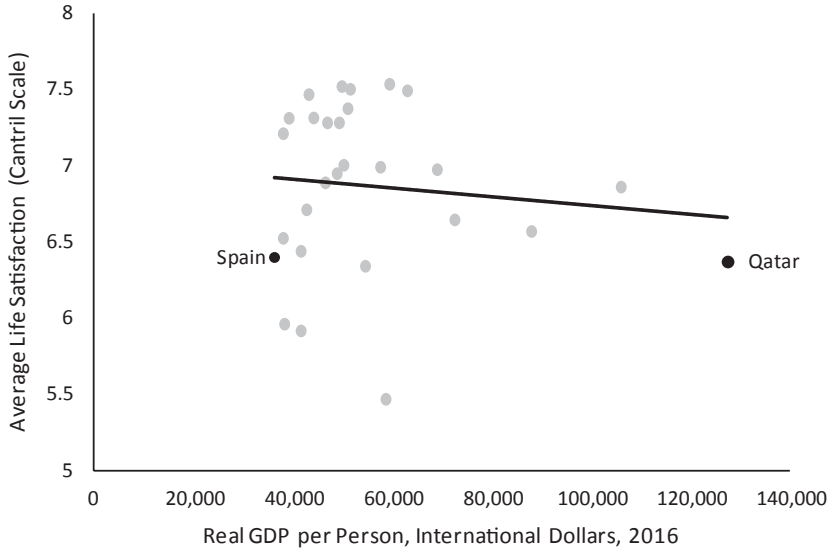

Fig. 7.2 Life satisfaction and real GDP per person, 28 rich countries (*Sources* Gallup; World Bank)

However, there is no reason for us to accept the argument that more income in itself always tends to increase life satisfaction. For example, the chart looks very different when we omit all those countries with a real GDP per capita below that of Spain (Fig. 7.2).

Good luck making the same argument now. We are left with a sample of 28 countries, and there is clearly no significant relationship between reported life satisfaction and income per person at all, logarithmic or otherwise.

Moreover, in countries like the USA, it is not obvious that reported life satisfaction has been increasing over time. This is easily seen by splicing together life satisfaction data from the Gallop Poll and data based on the happiness question on the General Social Survey. Alternative data sets, for example from the World Values Survey, tell essentially the same story. While real GDP per capita has increased over many years in rich economies, such as the USA, there is little evidence that this has led to an increase in average reported life satisfaction or happiness. This observation, which is known as the *Easterlin Paradox*, has been known about

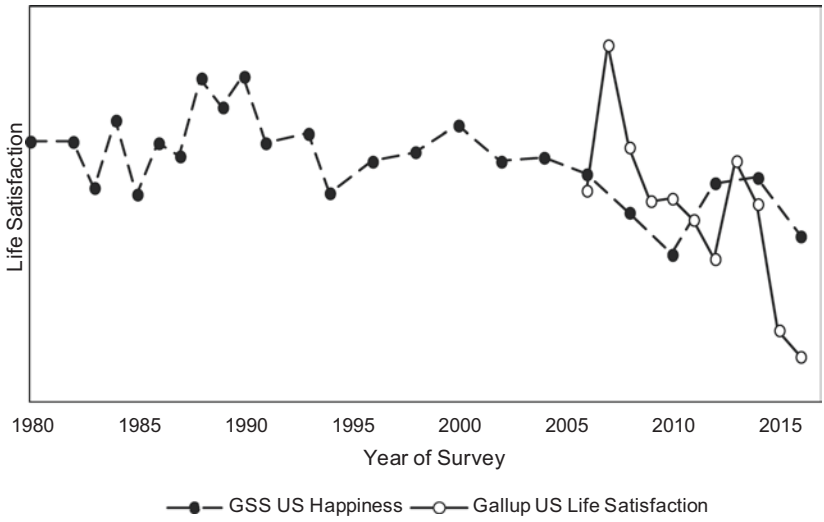

Fig. 7.3 Happiness in the USA (*Sources* Gallup; US General Social Survey)

for over forty years (Easterlin 1974). You can of course point to confounding variables, like congestion, pollution and the stresses of modern living, which it can be argued have prevented what would otherwise have been an increase in well-being, or a societal addiction to a hedonic treadmill, but this does little to recommend the pursuit of growth for the sake of growth. Edward Abbey's description of such purposeless growth as 'the ideology of the cancer cell' comes to mind (Fig. 7.3).

While it is possible to torture the data with econometrics in an attempt to justify some remaining positive link between subjective well-being and incomes, or to talk about an inevitably rising reference point as material aspirations increase (that hedonic treadmill), the simple fact is that in most countries a very significant increase in real incomes has been combined with no change in average reported subjective well-being (Easterlin 1995). Real GDP growth in high-income countries looks to a large extent like an arm's race, with negative externalities, even if we ignore any ecological costs that growth might generate.

It is true that within each country individuals with higher incomes tend to report higher levels of life satisfaction, but the most plausible explanation for this, once people have enough income to meet their basic

needs and provide a degree of economic security, is that it is based on social comparisons with their reference group, and/or comparisons with their own prior expectations, plus the use of income as an indicator of personal success.

As already stated, real people evaluate outcomes and life experiences relative to reference points, or benchmarks. This is a normal human characteristic. In the context of income or wealth, or social status more broadly, it suggests that we are most likely to evaluate our well-being by comparing our position relative to our own recent past experience, to our prior expectations, or to those people with whom we closely identify. We know this intuitively, and there is plenty of evidence to support the idea, some of which was cited in Chapter 4 and will be cited again below.

Leaving such subjective measures of well-being aside for a moment, social researchers have shown that for almost every possible measure of what it means to be a sustainable and successful society, there is no significant relationship between that measure and real GDP per person, at least for the richer countries. Instead, using whatever metric you choose, including mental health or statistics on crime, more successful societies tend to be more equal ones. Going back to our life satisfaction chart, it comes as no surprise that income is much more evenly distributed in Norway than in the USA, and more evenly distributed in both these countries, and in Spain, than it is in Saudi Arabia or Hong Kong. This alone is a strong argument for moving away from maximum growth as an overriding policy objective.

In the context of income or wealth inequality, prospect theory suggests that disadvantageous inequity (rather than inequality, per se) is liable to have a greater impact on emotional well-being than advantageous inequality. Even if people do not care about the well-being of others, and derive positive well-being from advantageous inequality, from a social welfare perspective, reference dependence and loss aversion give us a powerful argument in favour of an equitable society which is not dependent on any notion of a diminishing marginal utility of wealth. This too is unsurprising, for an intelligent social species.

However, we know that people often do care about the well-being of others, and depending on how circumstances are framed, often dislike advantageous inequality, especially if it is perceived as inequitable. Even if there was a trade-off between equity and growth, equity should normally take precedence. As it is, there is no evidence of such a trade-off, and indeed the opposite may be true.

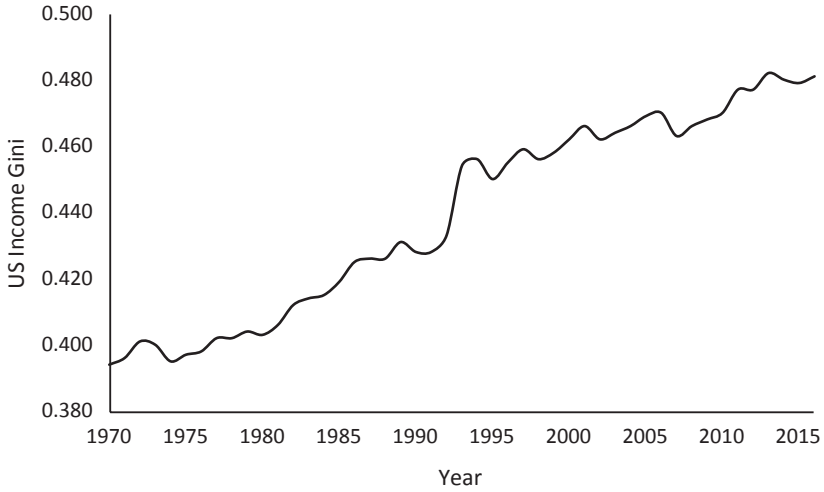

Fig. 7.4 Inequality in the USA (*Source* Federal Reserve Economic Data. Federal Reserve Bank of St. Louis)

It is well-known that the distribution of income and wealth has grown increasingly unequal in the USA since the 1970s, so that the USA no longer has a degree of inequality which can be described as that of a modern developed economy, but one that has reverted to the days before 1929. The most commonly used statistic for inequality remains the Gini statistic, despite the fact that it has well-known limitations. The US Gini statistic tells a sad tale, given what I have just said for the importance of equality if we aim for sustainable prosperity and a successful and inclusive society (Fig. 7.4).

An indicator of the attitudes of those with political power towards inequality and the well-being of those on low incomes, and of the extent to which policies have been based on the soft economics of supply-side economics, with tax incentives for the rich and neglect or punishment for the poor, is the evolution of the federal minimum wage over time.

The US federal minimum wage, as set by Congress, has been $7.25 per hour for almost a decade. It is obviously not raised automatically over time in line with the cost of living and does not even apply to a variety of workers, including those reliant on tips. In 2011, nearly 4 million Americans were on or below the federal minimum wage, making up more than 5% of all hourly paid workers. This means not just relative

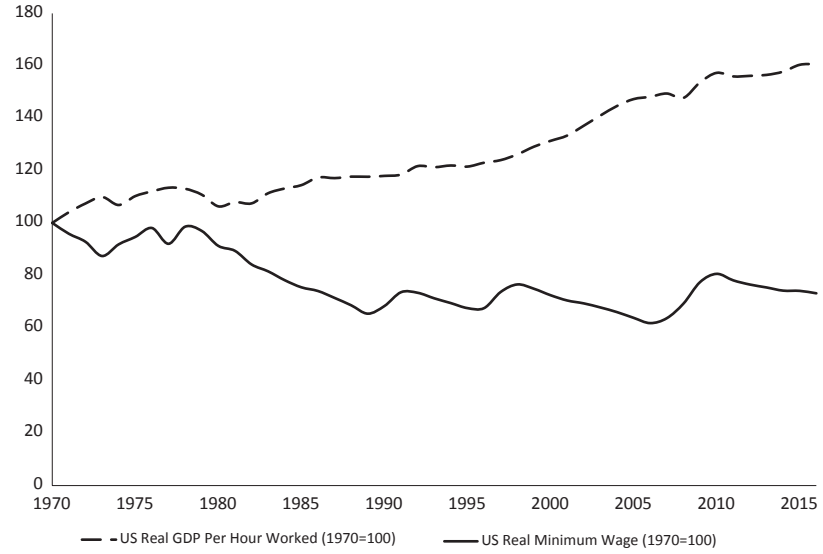

Fig. 7.5 Productivity and the minimum wage (*Source* OECD Data. Organisation for Economic Co-operation and Development)

poverty, but absolute poverty. A full-time job pays about $15,000 a year, if you are on the federal minimum wage. It is impossible to live with independence, security and dignity on that wage, even for a single adult with no dependents.

As of September 2017, 29 states and Washington DC had minimum wage rates above the federal minimum, but these rates were not high enough for those in minimum wage jobs to have maintained the same relative position in the US distribution of income as their counterparts in 1970. The real federal minimum wage in 2016 was 27% below its 1970 level, as well as being much lower than the equivalent in the UK, and more than 70% below the level in Australia.

For those in full-time employment, to restore the real value of the US federal minimum wage at its 1970 level, it would by 2016 have needed to be not $15,000 a year, but $20,500 a year. To raise the real federal minimum wage in line with increases in US labour productivity, the wage should now be not $20,500, but over $33,000. In other words, the federal minimum wage would need to be more than doubled to restore to the lowest paid to their relative position in 1970 (Fig. 7.5).

A just federal minimum wage in 2017 should be close to $16 per hour, which is higher than the current minimum wage anywhere in the country. The question, then, is how, in the modern US economy, it would be possible to guarantee people the right to work as many hours as they might choose, up to the normal full-time working week, at a guaranteed minimum of $16 per hour. The answer to that question is that a federal job guarantee is needed to set such a floor for wages and to guarantee acceptable working conditions for vulnerable groups. A job guarantee at such a wage would be a major element in a policy framework designed to reverse the growing inequality of income since the 1970s which was demonstrated above. Without that job guarantee, the minimum wage for many people is not a minimum at all. And as I have already said, the right to work, and the opportunity of a fairly paid, productive and respected job, is of great importance.

For real people, the opportunity of secure employment is of importance for their emotional and physical well-being. Meaningful employment satisfies human needs, on a variety of levels, and delivers social status. Since the world consists of people with such needs, we ought to have an appropriately designed job guarantee, to meet them. The idea that a healthy and sustainable society can be based on a division between a group who are in paid employment, and at least a substantial minority who are not in paid employment, but supported as consumption machines, is not supported by the evidence. The reference point for most adults is one of a fairly paid job with good working conditions. To do better than this is good—to do worse, or to be unemployed, is for many a source of continuing emotional pain.

Most people have a baseline level of subjective well-being, to which they revert over time, even following a variety of major positive or negative life events. The overwhelmingly most important determinant of this baseline is individual personality traits. Many significant life events have at most a marginal impact on that baseline. In most cases, even though negative life changes evoke a stronger emotional response than positive ones, consistent with loss aversion, the impact is mainly if not entirely temporary. Time passes, people spend less of their time thinking about the change in their circumstances, and they revert, more or less, to the level of life satisfaction they reported before. Often, this is within a few months and generally within about four years. There is an adaptation effect (Frederick and Lowenstein 1999).

Unemployment on the other hand, like persistent pain, has a long-lasting and perhaps permanent effect on well-being. It seems to shift the baseline (Clark 2006). Some studies find evidence that the unemployed partially adjust to the experience, but there are other studies that find no significant evidence of habituation at all. This may also be true, though to a lesser extent, of underemployment, and of insecure employment.

The reference point for most people is to be employed at what is seen as a fair wage, with fair working conditions. Falling below this reference point, and particularly falling into involuntary unemployment, causes a significant and persistent loss compared to the established social norm and can be expected to have a negative impact on subjective well-being and social cohesion.

An experience of involuntary unemployment seems to affect reported well-being negatively, even subsequent to a successful return to employment. People who have been unemployed are permanently affected by the experience. This is, obviously, very serious news for countries with mass youth unemployment, and once again this is independent of any impact that unemployment may have had on human capital development and therefore productivity.

The experience of unemployment may have a greater impact on well-being in a more individualistic culture. Higher levels of localised unemployment, even though they imply a reduced likelihood of finding employment, reduce the impact of unemployment on the well-being of the unemployed. This is because the social comparison effect is strong enough to outweigh the implications for the probability of re-employment. However, a higher level of unemployment reduces the subjective well-being of those currently in employment.

There is evidence that unemployment and underemployment are associated with adverse health outcomes, particularly in the case of mental health, and that this effect is not simply a reflection of poor lifestyle choices, particularly among young people. Unemployment appears to cause 40,000–45,000 suicides each year, with a higher rate of suicides in years of high unemployment (Nordt et al. 2015).

The above results apply, even when other influences on subjective well-being, such as real incomes, have been adjusted for. The main impact of unemployment and underemployment on subjective well-being does not appear to be financial, but emotional. Just compensating the unemployed for the income they have lost is not nearly enough to restore them to their prior level of reported life satisfaction (Young 2012). Where

studies have attempted to identify the necessary income transfer to fully compensate people for losing their jobs, in terms of restoring them to their previous levels of happiness, they have come up with what appear to be extraordinarily high required sums. A basic and unconditional income transfer does not compensate most people for losing their job. It is a mistake to see human beings as consumption machines. It is a mistake to see paid work as necessarily a carrier of disutility.

It is reasonable to conclude from the above that the avoidance of significant levels of involuntary unemployment and underemployment, and particularly long-term and youth unemployment and underemployment, should be a public policy objective of the highest priority.

Official Unemployment Statistics

Before proceeding further, I ought to clarify how official unemployment rates are estimated, and the extent to which these official statistics reflect the damaging social phenomenon we aim to eliminate. In the USA, the headline unemployment rate is what is known as U3 unemployment. The U3 unemployment rate is an estimate of the number of unemployed workers as a percentage of the labour force. The labour force is defined to include those who are officially unemployed and those who are in paid employment. The statistic is based on a monthly survey of 60,000 households, including about 110,000 individuals.

To be classified as unemployed, an individual must have had no paid employment during the survey week, must have been actively seeking employment in the previous four weeks, and must be available for work. To be classified as employed, an individual need only have worked for pay for a single hour during the survey week, even if the work is temporary work. You are also employed if you have a job, but are on leave, or not at work due to an industrial dispute with your employer. If you are not in paid employment and have not been actively looking for work in the past four weeks, or are currently unavailable for work, you are neither employed nor officially unemployed, and so not counted as part of the labour force.

This means that the headline unemployment statistic omits those sometimes described as marginally attached workers, including discouraged workers, who do not fit within the above definition of what it means to be unemployed, and classifies as employed people who are employed part-time only because they are unable to gain more hours of

employment each week. The U6 unemployment statistic includes both these groups, and so provides a better, if necessarily still imperfect, indicator of the degree of labour force underutilisation in the economy. Other statistics, including the participation rate, which is the labour force as a proportion of the adult population, and the employment to population ratio, also have their uses, but U6 unemployment is as good a statistic to use an any other when discussing the social costs of unemployment and setting a target for the unemployment rate.

In November 2017, there were about 256 million people in the US civilian non-institutional population, which includes all those who were 16 years or over, and not in the armed forces, prison, or in mental facilities or homes for the aged. Of these, about 160.5 million were classified as part of the labour force, including 154 million who were employed and 6.5 million who were recorded as unemployed. This implies that 95.5 million people were not part of the labour force, which includes about 1.5 million marginally attached workers, of whom almost a third were classified as discouraged. Of those in employment, 4.8 million were employed part-time for economic reasons, rather than by choice.

U3 unemployment was therefore about 4.1%, while U6 unemployment stood at 8.0%. A focus on the headline U3 unemployment measure is potentially misleading, as it makes the economy look much closer to full employment than is justified. An absence of wage inflation and a continuing increase in income inequality and poverty in the USA, almost a decade after the onset of the Great Recession, tells another story. As do high unemployment rates in areas of deprivation within the US economy, and among disadvantaged groups. The U6 measure is a better summary indicator of the state of the US labour market. Given much lower levels of involuntary part-time employment and discouraged workers during the 1960s, it is also a better indicator to use for comparisons of unemployment over long periods of time. There is a good argument that the headline unemployment statistic, in the USA and in many other countries, is no longer fit for purpose.

A Guaranteed Job

A job guarantee would deliver tight full employment, so that only those who chose to remain outside the programme while temporarily between jobs were unemployed at all. This frictional unemployment would probably make up not much more than 1% of the labour force, and certainly

less than 2%. There would be virtually no discouraged workers, and there would be no involuntary part-time employment, so that this target of 1–2% at the most for unemployment can be interpreted as a target for U6 unemployment, rather than the current headline measure.

It is an artefact of general equilibrium models that unemployment is caused by a lack of incentives to work, or by the characteristics of unemployed workers. This is fundamentally misleading and precludes any serious discussion of a job guarantee. There are echoes of Minsky' prince here, constrained by the theories of his intellectuals, and precluded from even asking important questions about policy. It was a failure to implement a job guarantee as an institutional mechanism for sustainable full employment which contributed to the stagflation of the 1970s, the mass unemployment of the 1980s, and economic insecurity for millions in an increasingly unequal society in more recent times.

A Neo-Keynesian pump priming approach, matched with growing public-sector employment, was successful in achieving and maintaining something close to full employment in a large number of countries over the period from the 1940s to the early 1970s. However, as Hyman Minsky identified, its relative success was due to social and institutional factors which were likely to evolve in such a way as to make pump priming more inflationary, and the stop-go policy cycle more problematic. In addition, an untargeted stimulus to total spending is liable to benefit disproportionately those with higher levels of income and better employment prospects, and is unlikely to benefit the most disadvantaged and those most likely to remain long-term unemployed.

An employment guarantee scheme, on the other hand, would benefit those who most need the help. It would lead to the right amount of net government spending in the right locations; it should be less inflationary and have better ecological consequences; and it would eliminate involuntary unemployment. The unemployed could be hired as and where they are, at an equitable floor social wage, so that the willing workers that the private sector does not employ would be offered employment and training until such time as private-sector expansion drew them back out of the job guarantee scheme, and into the privately employed labour force (Mitchell and Fazi 2017).

A well-implemented job guarantee would act as a Minskian instability thwarting mechanism, providing an anchor for inflation and the norms used as a basis for pay negotiations and price setting. To understand this fully, it is necessary to recall the orthodox approach to modelling inflation; to appreciate the degree to which any such approach to

understanding the drivers of inflation, when shorn of historical, social and institutional factors which cannot easily be fit into a mathematical model, is liable to be misleading; and to emphasise the lack of convincing empirical support for the orthodox approach.

Phillips Curves

The modern, orthodox approach is based on the New Keynesian Phillips Curve, or aggregate supply equation, which was described in Chapter 2. That approach, with its forward-looking households and their rational expectations, is extremely unrealistic. At least Milton Friedman's monetarist approach, on which the New Keynesian theory was built, is superficially more plausible. Friedman's version is known as the Expectations-Augmented Phillips Curve.[4] In Friedman's model, unemployment below its natural rate is combined with accelerating inflation, while unemployment above its natural rate is essential for the inflation rate to fall.

$$(\pi_t - \pi_{t-1}) = -\lambda(\mathrm{u}_t - \mathrm{un}_t) + \eta_t\,, \tag{7.1}$$

where $(\pi_t - \pi_{t-1})$ represents the change in the rate of inflation between time t and $t-1$; u_t and un_t represent the unemployment rate and the natural rate of unemployment, at time t, respectively, η_t represents a cost-push 'shock' to inflation, and $\lambda > 0$.

This formulation is very flexible, in that the η_t term is always available to allow for any changes in the inflation rate which are difficult to account for with respect to output gaps. More importantly, the output gap (and 'natural rate of unemployment' or 'non-inflationary inflation rate of unemployment') is itself free to vary and has no well-defined and generally agreed set of determining factors. Indeed, in addition to trends for output, recent inflation and unemployment data are commonly used as inputs in the process of estimating the current 'natural rate of unemployment' and 'potential' output.

However, there remains one big problem with this 'accelerationist theory' of inflation. It is the fact that significant variations in unemployment, which are difficult to account for as being due to changes in any 'natural rate' of unemployment or trend growth for productivity, regularly happen with no evidence of either continuously accelerating or decelerating inflation as a result (Fig. 7.6).

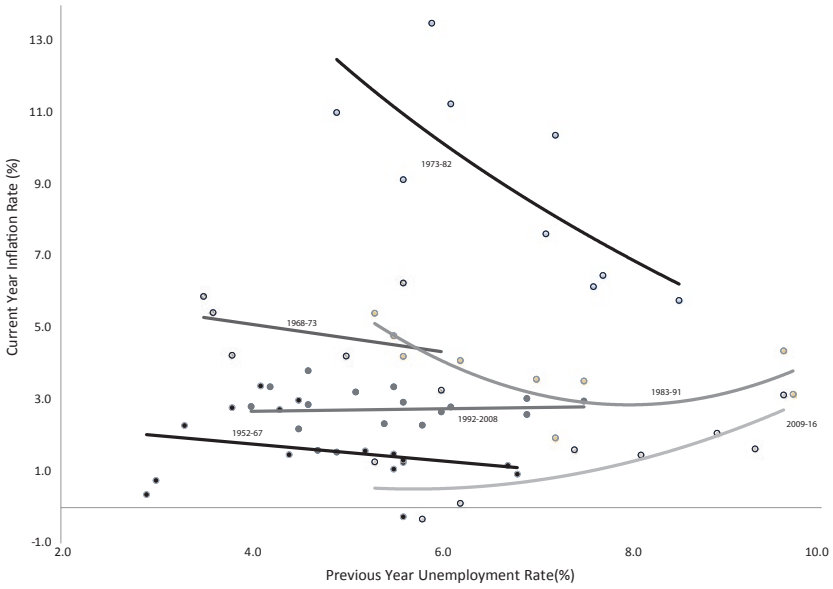

Fig. 7.6 US 'Phillips Curves' (*Source* Federal Reserve Economics Data. Federal Reserve Bank of St. Louis)

For example, there has never been any convincing evidence in favour of the natural rate or 'accelerationist' hypothesis in data for the USA. It is not impossible to amend the orthodox model to make it fit the data, by building a sub-model to 'explain' shifts in the non-accelerating inflation rate of unemployment over time. However, there is no good reason to do so. We have established that the soft economics of real analysis is not built on reliable foundations. It is not the most plausible available explanation for the changes in inflation and unemployment rates in the USA over time. It is not clear that generalised excess demand has been a significant driver of inflation at any stage since 1952, either in the USA or in other high-income economies. We are free to consider other, more plausible explanations.

It is possible, based on historical, social and institutional factors and on subjective judgement, rather than on statistical testing, to divide these 64 years into six discrete periods of time. Within five of these six periods, there was relative stability regarding the social norm for inflation, with

the sixth period being marked at its beginning by a combination of an oil price shock and a fight over the distribution of income in a stagnating economy, and at its end by a political transition from the post-war consensus to neoliberalism, and from Neo-Keynesian to monetarist supply-side economics.

The six periods are as follows:

1. Post-war prosperity (1952–1967)
2. The Nixon years (1968–1973)
3. Stagflation and the shift to neoliberalism (1973–1982)
4. Reaganomics and after (1983–1991)
5. The 'Great Moderation' (1992–2008)
6. Great Recession and recovery (2009–2016)

The first period was one of relatively stability, with an average annual inflation rate of approximately 1.6% and an average rate of unemployment of below 5%. During the second period, when the average rate of inflation increased to almost 5%, the average rate of unemployment remained below 5%. It is tempting to contrast 2017 data with these years, and to argue that the labour market today compares quite well, at least if you ignore the far higher degree of income and wealth inequality than existed back then. However, it is probably more appropriate to compare these rates of unemployment with U6 unemployment rates today, than U3 statistics, since there was far less underemployment in the 1960s than there is today. Those were years of shared prosperity, close to full employment, and, until the late 1960s, low inflation. Labour productivity was rising, union membership was much higher than today, and the bargaining power of labour was able to limit Kalecki's 'degree of monopoly' in the business sector. Hence, real wages rose in line with increasing productivity, and inequality fell. Broadly similar circumstances existed in other high-income economies during those years, for similar reasons.

By the late sixties, however, productivity growth had begun to stall, and accelerating costs had begun driving upwards the social norm for inflation. The upwards shift in inflationary expectations after about 1967 is shown on the chart. Minsky attributed rising inflationary pressures, at least in part, to the use of Neo-Keynesian pump priming, incentives for private-sector investment, and social welfare, in pursuit of full employment and a war against poverty, rather than opting for a job guarantee to

achieve the same objectives. The social and economic factors which had allowed for two decades of prosperity and low inflation were temporary, and the appropriate institutions were not in place to stabilise an unstable economy.

The big increase in inflation happened during and subsequent to the oil shock of 1973. This was followed, in the USA and around the world, with a transition away from policies designed to keep the economy close to full employment, and towards those aimed at bringing inflation back down to something like its levels in the fifties and sixties. By the early eighties, those in power in the USA, the UK and most other high-income countries were committed to the use of tight monetary policies to crush inflation and claimed that only neoliberal supply-side policies and trickle-down economics could deliver growth. The extent to which it was really the high interest rates of these years which brought inflation back down, or other factors driving falling oil prices, is a controversial issue. What is less controversial is the increase in unemployment and inequality which those policies caused. Unemployment rose to its highest level since the 1930s and remained high for much longer than the proponents of a monetary squeeze had anticipated.

The downward pressure on the share of wage income in real GDP associated with the energy shock and subsequent economic policies can be explained with reference to Kaleckian income distribution theory, as outlined in Chapter 3:

$$W/Y = 1/(1 + m \cdot j)\,. \tag{3.10}$$

This is an equation for the before-tax share of wage income in GDP, where m is the pricing mark-up over labour and material costs, covering both overheads and before-tax profits, and dependent on 'the degree of monopoly', and j in this context can be interpreted as the share of oil producers in GDP.

If the degree of monopoly and the mark-up don't change, then an increase in j, due to a significant increase in the relative price of oil, puts downward pressure on the share of wage income in GDP, and upward pressure on the share of capital income out of a diminishing real GDP.

Against the background of prolonged full employment, an apparent social contract that real wages would continue to rise as before, and with powerful trade unions, it appeared that social conflict inflation was likely. This is particularly the case given that the increased economic uncertainty provided greater scope for what Babcock and

Loewenstein called *self-serving bias* in assessing what are reasonable wage claims. I contend that this description of the changing circumstances between 1970 and 1974 is far more useful than any version of the New Keynesian/Expectations-Augmented Phillips Curve.

The period from 1974 to 1991 was far less successful in terms of economic outcomes than what had come before and was characterised by much higher levels of unemployment, and the beginnings of significant underemployment, among people forced into part-time work for economic reasons. Monetarism and supply-side reforms worldwide transformed the norm for what could be expected from governments, particularly in the context of the labour market; privatisations and financial deregulation helped to create the conditions for Minsky's 'money manager capitalism' and growing financial fragility; and tax reforms greatly decreased the progressivity of tax systems. Unemployment remained very high, compared to the norms of the fifties and sixties, and was highly variable.

Against the backdrop of another recession, there was a further transition, partly due to global factors, but exacerbated by domestic policies, in the early 1990s. Between 1980 and 1992, the rate of inflation had fallen decisively enough, so that a combination of underemployment and insecure employment; reforms to the labour market and structural changes to the economy that undermined the bargaining power of labour and increased Kalecki's 'degree of monopoly'; an increasing supply of goods and competition for domestic labour from low wage workers in Mexico, and later in China, and in other emerging economies; for the majority of the period lower energy prices; and, from 1993, an increasing acceptance that the Federal Reserve would set interest rates to stabilise inflation at a permanently low level, all helped to restore the social norm for inflation to a level similar to that of the 1960s. The economy had reached its 'great moderation', and orthodox macroeconomics had settled on its New Keynesian 'new consensus', with the Taylor Rule, supply-side policies, and a neglect of genuine full employment and income inequality.

The Great Recession showed the great moderation as the fraud that it was, and should have caused economists to abandon their 'new consensus' dynamic stochastic general equilibrium model. Instead, soft economics swept the fraud under the carpet, soft economists adjusted their model without, in the case of the majority, considering whether the whole model should be abandoned, and effectively the profession went on as though

nothing significant had happened. Not surprisingly, the chart shows that the shock of 2008 caused the social norm for inflation to drop further still, so that inflation was less of an issue in the decade following the Great Recession than it had been at any time since the 1930s.

It is very difficult to describe the above in terms of rightward and later leftward shifts in a 'natural' rate, or non-accelerating inflation rate, of unemployment. It is better to reject the natural rate hypothesis and the associated accelerationist theory of inflation as a useful description of history. This means a rejection of the Expectations-Augmented Phillips Curve and the entire orthodox macroeconomic model. By this stage in the book, this should not be a surprise. This approach to macroeconomics was shown to be misleading in Chapter 2, and since then we have been constructing a more useful map to guide us to sustainable prosperity.

A Three-Part Phillips Curve

If we are to reject the Expectations-Augmented Phillips Curve as a useful tool to use for the discussion of a job guarantee, the question which arises is what to put in its place. The data are largely consistent with a Phillips Curve which is horizontal across wide variations in the rate of unemployment, but which shifts over time due to changes in social and institutional factors and inflationary expectations.

Godley and Lavoie, in their more sophisticated models, use a target real wage equation, consistent with a Phillips Curve with a horizontal mid-range settlement.[5] This is justified with reference to a variety of empirical studies, including one by Barnes and Olivei (2003). The Barnes and Olivei study compares a three-part Phillips Curve, against a more conventional Phillips Curve, using US data from 1961 to 2002, both for a constant 'natural rate of unemployment' and time-varying Congressional Budget Office estimate of the *NAIRU*. The authors show not only that the three-part version is a statistically significant improvement to a conventional Phillips Curve. They also show that it performs much better when used as a basis for dynamic simulation. The middle section of their Phillips Curve has a statistically insignificant slope coefficient, which is entirely consistent with a horizontal mid-range segment.

If we are to use any kind of Phillips Curve relationship to characterise the socially and institutionally conditioned relation which may exist between inflation and unemployment, it seems best to use an approach consistent with the above, where the horizontal section is drawn at the

current inflation norm. This is notwithstanding the potential for significant and rapid changes in unemployment to shift that inflation norm, which also shifts when other factors change which influence the relative bargaining power of labour and capital, or when institutional factors cause changes in inflationary expectations.

In the discussion below, I will retain the term *NAIRU* (non-accelerating inflation rate of unemployment) to denote the unemployment rate below which the inflation rate may rise or even plausibly accelerate over time, but avoid referring to this as in any sense a 'natural rate', and use the term SLUMP for an unemployment rate above which the inflation rate is likely to fall, and could potentially turn negative (Fig. 7.7).

The inflation norm can be interpreted as the expected rate of inflation, when unemployment remains between *NAIRU* and *SLUMP*, but even then it will not be met if there are significant short run cost-push factors not related to the labour market (e.g. changes in energy prices). Changes

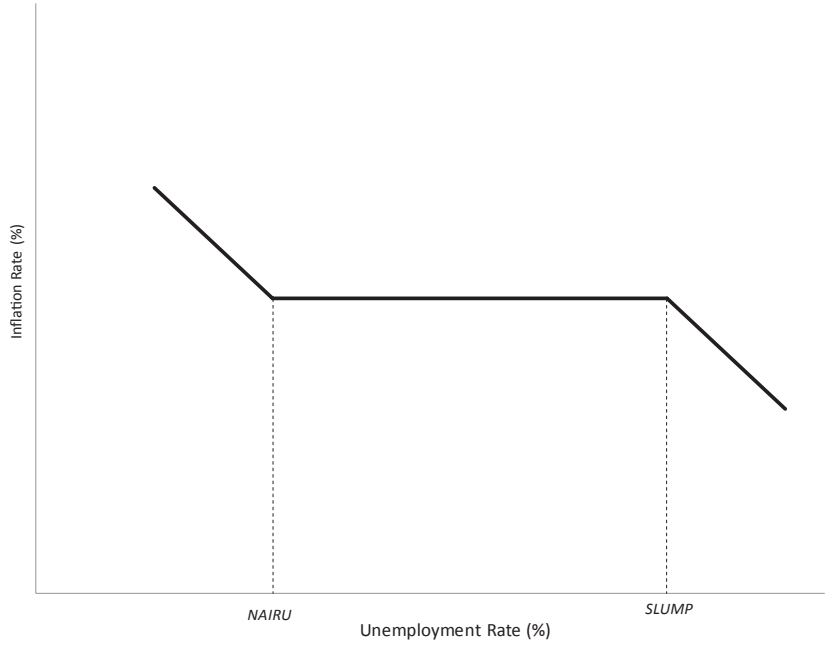

Fig. 7.7 3-part Phillips Curve

in social, institutional or structural economic factors, such as I have briefly discussed above, have the potential to change this inflation norm over time, shifting the curve up or down, or to change the *NAIRU* and *SLUMP* unemployment rates limiting the mid-section of the curve.

While the unemployment rate remains between *NAIRU* and *SLUMP*, there is no reason to anticipate that moderately paced changes in the rate will have an impact on inflation. If the unemployment rate falls below *NAIRU*, the tightness of the labour market implies the likelihood of rising real wage aspirations in pay bargaining and therefore rising inflation. It is a mistake to describe this as demand-pull inflation. There are still unemployed and underemployed resources in the economy. If the unemployment rate rises above *SLUMP*, the bargaining power of workers is reduced by employment insecurity and the threat of unemployment or underemployment, and inflationary pressures are moderated. As I have said, the location of *NAIRU* and *SLUMP* will not be constant, with Barnes and Olivei estimating that unemployment rates of between 4 and 6.5% were consistent with stable inflation in the USA between 1985 and 2002.

A modified form of 'accelerationist' argument can be rescued from the above. If unemployment falls below *NAIRU* and remains there for long enough, then the new higher rate of inflation will become the social norm, and the continuation of unemployment below NAIRU has the potential to stoke further increases in inflation. This depends very much on social institutions, however, and is not automatic. In addition, a low level of unemployment over time has the potential to reduce the *NAIRU*, so that the rate at which non-inflationary employment can be sustained is subject to hysteresis.

The inflation norm seems to have shifted significantly twice in the USA, since the 1950s. The first time was a big upward shift in the early to mid-1970s, when it was a mix of cost-push and institutional factors which were to blame. The second was the recession of the late 1970s and early 1980s, when both the persistent rise in unemployment above *SLUMP* and the speed with which unemployment rose were the main driving factors.

One very real and pressing problem is that the level and structure of real output necessary for the private sector to approach full employment may not be ecologically sustainable, due to the emission of waste; excess use of renewable resources; depletion of non-renewables; and losses in biodiversity. Ecological economists have long advocated the rationing and pricing or taxation of ecological resources, in order to ensure

sustainability conditions are respected; and to refrain, at the micro level, from activities which do not have properly defined marginal social benefits in excess of their marginal social costs. The pricing of ecological resources creates an inflation barrier similar to structural unemployment, and one which may bite earlier.

The problem in this case is not with the immobility of labour, so much as a need to redirect employment to 'green' activities, or at least activities with less damaging ecological consequences, and possibly even to allocate opportunities for paid employment and real incomes in a steady-state economy (where 'steady state' refers to the employment of ecological resources), divorcing the goal of full employment from a requirement to maximise growth in real GDP.

However, the NAIRU concept is interpreted within this model, and it is important to remember the human consequences of involuntary unemployment and underemployment, it is clear not only that there was a persistently low norm for inflation during the 1950s and 60s, but that there was also a persistently low NAIRU. While a particular set of historical, social and institutional factors permitted the attainment of consistently high levels of employment by conventional Neo-Keynesian methods, from the 1940s to the early 1970s, those specific factors were temporary and cannot be precisely restored. This does not, however, mean that it is impossible for tight full employment to be firstly achieved and secondly maintained, even based on the U6 measure of unemployment.

Keynes, Kalecki and Minsky were among the most prominent economist to have noted that the failure to provide for and sustain full and equitable employment is a characteristic failure of capitalist economies. Keynes identified mass unemployment to be the result of a failure of the effective demand for labour and therefore technically within the power of governments to eliminate. Kalecki agreed that governments are technically able to eliminate unemployment, but believed that they would not choose to do so persistently, due to considerations of political economy.

Minsky saw both welfare payments to the unemployed and traditional Keynesian pump priming as ineffective solutions to a lack of effective demand for labour. One of the reasons was that both would prove to be inflationary. Minsky explained and advocated for an employer of last resort scheme, or what we now call a job guarantee, as an instability thwarting mechanism, and a way to deliver equitable, sustainable and non-inflationary full employment.

Replacing NAIRU with NAIBER

What is needed is a new institutional framework for delivering and maintaining full employment. It involves guaranteed employment and the replacement in the model of the NAIRU with a NAIBER (Mitchell 1998). NAIBER stands for the 'Non-Accelerating Inflation Buffer Employment Ratio'. The buffer employment ratio replaces the unemployment rate with the ratio of workers in the job guarantee scheme relative to the total available labour force. This is the replacement of our existing buffer stock of the involuntarily unemployed and underemployed with an employed buffer stock of workers within a public-sector job guarantee. The scheme would be a shock absorber for the economy—expanding to employ workers when they have been shed from the private sector during a downturn, and contracting automatically as the private sector absorbs labour from the job guarantee scheme in an upturn.

Ecological modern monetary theorists have referred to an ecologically sustainable NAIBER, or ESNAIBER,[6] in the context of a job guarantee as an element in a transition to an ecologically steady-state economy, given the ecological constraints referred to above.

The NAIBER could be below or above the NAIRU, once an employment guarantee scheme was in place. The availability of a paid job in a job guarantee might reduce the disciplinary effect that the threat of job losses can exercise on real wage aspirations and inflationary pressure. If so, the NAIBER may be above the NAIRU. On the other hand, competition from an employed buffer stock of replacement workers, as opposed to an unemployed buffer stock, might increase the discipline, in which case the NAIBER may lie below the NAIRU. In any case, those in the job guarantee would not be unemployed and would be performing work of social value.

It would be a positive supply-side measure, as it would retain workers in socially productive employment, when there is no demand for them at an acceptable real wage within the private sector. In addition, training and further education would be offered to participants as part of the scheme.

It would set minimum socially acceptable real wage rates and working conditions across the economy generally, as workers without bargaining power would now always have the option of working in the scheme.

It would be 'green', in the sense that those activities carried out within the scheme would either contribute positively to the natural environment or at least would be designed to minimise their environmental impact, free of the need to generate a financial profit.[7]

Godley and Lavoie have emphasised that full employment requires a specific fiscal stance, given the spending and portfolio preferences of the private sector and the overseas sector. The problem is to determine the level of that fiscal stance, given the inherent complexity and uncertainties of the economy. The job guarantee is, as I have said, a bottom-up approach to fiscal policy, which, if well administered, ensures that funds are spent where they are needed and at the level that is necessary to deliver full employment—no more, no less.

An employment guarantee can contribute towards a more stable economy, by taking unemployed workers as they are and where they live, and providing them with the opportunity to undertake work of social value. This eliminates structural unemployment based on either occupational or geographical immobility. It provides a fiscal stimulus which is targeted to those regions where it is needed and which leads to the employment of those whom the private sector will not currently employ if the economy is to sit below its inflation barrier. Over time, a well-designed job guarantee scheme should not only provide employment of social value, and a variety of psychological benefits to would-have-been-unemployed described elsewhere in this chapter, but would also enhance the marginal employability of job guarantee workers in the private sector.

Labour saving technological change, plus the requirements of ecological sustainability, might gradually increase the size of the job guarantee scheme and the NAIBER over time. Increasing participation as discouraged workers are attracted to join the job guarantee scheme will also increase the size of the scheme relative to the economy as a whole, while the impact of an ageing population will mitigate and could reverse these effects. It is plausible to suggest that a job guarantee scheme may be required to grow in scale, diversity and complexity, unless or until social attitudes and norms towards employment hours and the role of paid employment in contributing towards well-being eventually change.

Uncertainty in the scale of a job guarantee implies that assessments of the net fiscal impact of such a scheme are difficult to make with confidence. In any case, the fiscal 'cost' of such a scheme would be intended to expand and contract as necessary to offset fluctuations in the effective demand for labour within the remainder of the economy, and the true cost of any such scheme ought to be defined in terms of its net impact on real and ecological resources, and not in financial terms. However, financial projections are required in the effective framing of public policy proposals, and estimates of the purely financial cost of a job guarantee are therefore important. Fadhel Kaboub (2013) estimated the cost of a

generous and extensive scheme in the USA, at a time of very high official unemployment, at less than 4% of GDP. Scott Fullwiler (2013) used an extensive open-economy stock-flow consistent econometric model to simulate a US job guarantee over time and show that the net effect on the fiscal deficit averages out at slightly less than 1% of GDP. These estimates are representative of other studies, including a recent report which has received a great deal of publicity in the USA, and provided support for a proposal for a job guarantee put forward by Senator Bernie Sanders (Wray et al. 2018).

That having been said, the net impact of a job guarantee on the fiscal balance is not the most significant issue. It is the real resources which are used, directly and indirectly, as a result of the scheme being in place which are relevant. Where these resources are labour resources which would otherwise have been unemployed, then in a sense a job guarantee would cost nothing at all. As Wendell Gordon[8] puts it, 'there is an important sense in which the job guarantee programme would not cost anything. The goods or services produced by the labour of the beneficiary of the job guarantee increase the gross national product and the national welfare by as much as the worker is paid as reliably as does any "free market" labour. The labourer is 'earning' the wage or salary received. Also, and importantly, the worker under the job guarantee programme has a job of which the worker can be as proud as are other citizens with their jobs'.

The two most important schemes in recent years sharing at least some of the characteristics of the job guarantee favoured by modern monetary theorists have been *Plan Jefes y Jefas de Hogar*,[9] in Argentina, between 2001 and about 2005, and *The Rural Employment Guarantee Scheme*,[10] in India, which has been in place since 2005. Neither scheme has come close to the characteristics of the full, comprehensive, permanent job guarantee which most modern monetary theorists advocate, but both have been broadly positive in terms of their net social benefits, have been administered on an extensive scale, have been popular among participants, and have at least shown what it would be possible to achieve.

Framing a Job Guarantee

People's willingness to consider a job guarantee scheme depends on how it is framed to participants and the public more widely. The success of the scheme once it is in place depends in part on how the rest of the

public relate to those working in the job guarantee sector. More generally, for the sake of social cohesion, we must address social attitudes towards the unemployed, underemployed, the insecurely employed and the discouraged. We have had more than three decades of discourse designed to reinforce attitudes among the employed that labour market outcomes are an efficient reflection of productivity and effort. More perniciously, we have financialised, or commercialised, our attitudes towards others, to the point where many see the unemployed as belonging to a different group to themselves, so that they do not identify with them or feel any responsibility for their well-being. This is all part of what Minsky labelled 'money-manager capitalism', in contrast to the 'shared prosperity capitalism' with which it should be replaced.

Anthropologist David Graeber (2011) argues that there are essentially three types of social attitudes we can form towards others. He distinguishes between *baseline communism, hierarchy* and *exchange*. I prefer to refer to *co-operative, patronising* and *competitive* social relations. It is important to remember that every real-world society is a mix of facets from all three of the following descriptions and every individual is prone to adopt the social attitudes described under different sets of circumstances.

In an economy with mainly cooperative social relations, we are all in this together, and the principle of 'from each according to their abilities, to each according to their needs' applies. Those who can contribute towards social provisioning are given the opportunity to do so, and it is normal for them to want to take up that opportunity. A concern for the welfare of others is normal, but this concern is for the well-being of social equals, and the distribution of wealth is probably not highly unequal.

In an economy with mainly patronising social relations, there is a hierarchy within which the productive and highly able and the unproductive and less able are separated. The former may accept an obligation to support the latter, and commonly look down upon them. Those with income and wealth see themselves as making sacrifices to look after the poor and weak, but do not see those to whom they believe they offer that support as being their equals. There is likely to be a high level of inequality, as well as social immobility.

In an economy where competitive social relations are dominant, others may be seen, in a sense, as social equals, but also as separate and there is less of a concern for the well-being of others. Inequality is seen as

natural and not a legitimate concern, and the principle of 'survival of the fittest' is believed to be valid. Those on low incomes are not patronised, but their needs are not prioritised. Instead, they are seen as having failed to compete effectively, and as being responsible for their own relative poverty. Those with higher incomes are seen to have succeeded, and to have deserved that success. There is little or no sense of community.

These are insights which have relevance for the potential political barriers to a job guarantee scheme, and to the potential social benefits, broadly defined, from such a scheme. Attitudes to other people are not fixed—they are highly plastic and context dependent, and influenced by the way in which social relationships and responsibilities are framed (Loewenstein et al. 1989).

Many, especially on the political right, position the unemployed as somehow different from, or alien to, us—as not part of our community. This is the view of those for whom there is 'no such thing as society'. In which case, they frame labour market relationships in a purely commercial and competitive exchange perspective. They might see the unemployed as in some sense potentially their equals, but not their responsibility.

The employed have no social relationships and responsibilities, beyond financial transactions. The unemployed have a responsibility to engage in 'truck and barter' as best they can. 'We' are separate from 'them'. 'We' may not look down on 'them', but 'we' are unconcerned for their well-being and for any inequality of social outcomes. The notion that outcomes could be inequitable has no meaning to 'us'.

This view, which has taken root and undermined social well-being, is at least in a sense egalitarian. It assumes others have the same life chances as us; that if they fail to take them it is not our responsibility; that people respond to financial incentives in a narrowly self-interested way; and that this is the appropriate way to organise our economic relations. Our view of others is financial and impersonal, as though the whole of life was a business transaction, and moreover a transaction with someone where we anticipate no ongoing relationship.

Others may see the unemployed as part of their society, for whom they have some responsibility, but as somehow lacking in the attributes necessary for employment. They lament a lack of skills among the unemployed, and/or low levels of literacy and numeracy. They lament unemployment, underemployment and relative poverty among indigenous peoples and among some refugee groups. The unemployed are part of us, now, but they are not at the same level as the rest of us. They are

dependent and must remain dependent. They are, perhaps, unemployable and must be supplied with welfare. This is the logic of a dependency culture. It is essentially a patronising and hierarchical attitude towards those vulnerable to unemployment and underemployment. It is kinder than the impersonal competitive exchange view, but hardly less offensive, and no more effective in building social stability. In this case, they might not like mass unemployment and consequent inequality, but they may see it as inevitable. The unemployed, like the poor, may always be with us.

A third perspective is the one named by Graeber as a form of 'baseline communism'. Cooperative social attitudes involve seeing others as both part of the same society of us and our equals. We share a mutual responsibility for each other. Those currently unemployed or underemployed are not separate from us, and they do not have a different social status and potential for useful employment. 'They' are 'us'. They can contribute towards the national product—not once they have been retrained or incentivised, but as they are now. This perspective, which Graeber argues is a characteristic of the traditional societies in which our ancestors lived for so many generations, will neither accept the unemployment of others as irrelevant to us, nor see unemployment as inevitable. From this perspective, our relationship with others extends beyond the economic and impersonal to the personal and social.

To 'sell' a job guarantee, policy makers must encourage people again to see everyone as part of the community, where relationships are not defined in narrow, impersonal financial terms, but in terms of mutual obligations and 'from each according to their abilities, to each according to their needs'.

They should also stress the social losses from a failure to implement a job guarantee—framing the debate along the lines of what we all lose, due to the involuntary underemployment of some.

Attitudes can and need to be shifted towards an aversion not only to disadvantageous inequality (which we all share), but towards an aversion for extreme forms of advantageous inequality, and a concern for the fair treatment of those who would currently not have opportunities for secure employment, in the absence of a job guarantee.

Essentially, the same insight can be derived from the work by George Loewenstein and his colleagues, which I referred to in Chapter 4. They published experimental data, you may recall, relating to perceptions of fairness and inequality in different contexts. The experiments involved presenting participants with a series of disputes between two people,

recording subjective utility scores of a variety of financial outcomes for self and the other, where outcomes were sometimes gains and sometimes losses, in non-business and business settings, and where relationships/attitudes towards the other were described as positive, neutral or negative. The results indicated that how people feel about coming out ahead of others depends on the nature of their relationships with those other people and their attitudes towards them. The framing of our interpersonal relationships affects what we regard as being fair or unfair. Loewenstein argued that people were less concerned by inequality in itself, than by perceived unfairness.

Human nature and social attitudes towards what is fair and how to evaluate inequalities are not fixed over time, but are plastic. We are influenced by evolving social institutions and norms, and of course by other people. There are interesting implications relating to politics, economic reform and social changes over the last 40 years. The shift towards Minsky's 'money manager capitalism' from a mixed economy consensus during that period has financialised social relationships and helped to shift attitudes towards the role of government and other social institutions, appropriate tax and welfare systems, and to support for the retired.

Loewenstein's work, as I explained in Chapter 4, suggests that political outcomes and social institutions are not governed by stable social preferences (as argued by the orthodox economists) but are fluid and can be changed. Hence, the key exogenous factors shifting the determinants of institutions and attitudes over time may be interest group pressures and effective political organisations (and even charismatic political leaders).

The good news is that the shift in social attitudes which has been associated with, and to an extent driven by, the neoliberalism of the past forty years, is reversible. During that time, we have allowed our leaders to create an increasingly individualised and financialised culture, and have participated in and in some ways contributed to that culture. In the future, we can elect a different set of leaders, and campaign for and participate in a more inclusive and cooperative culture—one which is consistent with sustainable prosperity.

Job Satisfaction

It remains to consider the essential characteristics of a job guarantee from the perspective of the participants in the scheme. In other words, 'what makes workers happy?' This is an area which has been explored

in-depth by other social scientists, but has only recently attracted much attention from economists.[11]

People appear generally happier in:

1. Jobs which offer secure employment
2. Jobs which are of clear social value and which provide immediate feedback
3. Jobs which allow a high level of worker autonomy and creativity
4. Jobs which involve a greater variety of tasks, provide opportunities for the use of existing skills and offer prospects for skill development
5. Jobs which allow for the development of social relationships with fellow workers and others
6. Jobs where workers are free to choose working hours
7. Jobs which are held in respect by others
8. Jobs where remuneration and working conditions are perceived as fair.

Not all of the above characteristics can always be designed into every task within a job guarantee scheme, just as they are not all embodied in every private-sector job, but the majority of them can be and ought to be. A job guarantee can also assist the private sector in the provision of better jobs, by setting a floor on working conditions, maximising the sense of purpose one obtains from a job, increasing one's involvement in workplace decisions and guaranteeing a form of secure employment.

There is no single optimal model for a job guarantee scheme. In different countries, and even in different regions within countries, the precise design of the scheme must reflect local needs and the characteristics of those people who are locally unemployed or underemployed who might choose to participate in such a scheme. It should also reflect what is deemed to be politically acceptable.

In many places, it is expected that local authorities would play a major role in the local administration of such a scheme. In the USA, not-for-profit institutions are expected to play a greater role. In some places, it would be more feasible for local co-operatives to be more prominent. In all cases, the transparency with which job guarantee projects are proposed, established and administered is of vital significance. The projects should as far as possible reflect the needs and aspirations of participants, meet obvious and unmet social needs, avoid competition for real

resources and markets with private businesses, and avoid substituting for conventional public service provision. Job guarantees must be based on voluntary participation, and pay and working conditions must set the floor for what is socially acceptable.

Proposals have been developed for job guarantees in the USA,[12] in Australia[13] and in an increasing number of other countries. Lessons have been learned from the successes and limitations of major partial job guarantees, such as the aforementioned *Plan Jefes de Hogar* in Argentina, and the Indian *Rural Employment Guarantee Scheme*; as well as from smaller programmes elsewhere, and from the *New Deal* programs of the 1930s.

At some future point, society may have attained the goal laid down in Keynes' famous essay, *Economic Possibilities for our Grandchildren*,[14] when paid employment will no longer be seen as a social norm, and people will be free of the need to engage in paid work to maintain an adequate standard of living, to enjoy a sense of purpose and self-respect, and to maintain social status within the community. Keynes was writing in 1930 and looking ahead a century to 2030, but perhaps we will have to wait a little longer than he imagined for his vision to be attained.

If and when the society envisaged by Keynes eventually develops, perhaps there will be no more need for a job guarantee scheme, and successful societies will be able to deliver an income guarantee to their citizens, without compromising their psychological well-being or social status. Until that time, a job guarantee appears to be an essential element of an economics for sustainable prosperity, for reasons of macroeconomic stability, social equity and cohesion, and ecological sustainability.

Notes

1. There is an overwhelming amount of evidence for this—provided by, among others (Clark 2006; Lucas et al. 2004; Young 2012; Nordt et al. 2015).
2. See the first equation in Chapter 2.
3. For more information on the *Cantril Scale* and on the methodology of the *Gallup World Poll*, refer to Gallup (2009).
4. The credit for the natural rate hypothesis, and the associated accelerationist theory of inflation, is properly shared between Milton Friedman and Edmund Phelps.
5. See Note 6, Chapter 6.
6. The ecological economist Philip Lawn introduced the term ESNAIBER, based on William Mitchell's NAIBER, and is an advocate for a job

guarantee to break the link between full employment and uneconomic real GDP growth (e.g. Lawn 2016, Chapter 3.
7. Mathew Forstater is another prominent advocate for a job guarantee to be designed to combine full employment with environmental sustainability (Forstater 2003).
8. Quoted in Mitchell (1998).
9. The lessons to be drawn from Argentina's Plan Jefes are discussed in Tcherneva (2012).
10. Kareemulla et al. (2013).
11. Including Van der Meer and Weilers (2013).
12. Tcherneva (2014).
13. Cook et al. (2008).
14. Keynes (1931).

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CHAPTER 8

Conclusion—Economics for Sustainable Prosperity

In my final chapter, I will summarise the main elements in a new economics for sustainable prosperity. Sustainable prosperity must 'guarantee all individuals a decent quality of life with dignity and the opportunity to be a member of an inclusive, participatory, and just society. Sustainable prosperity means that every decision we make, individually or collectively, must take into account its direct and indirect effects on people, on the planet, and on the economy'.

This requires the replacement of the old orthodoxy with a new approach to economic management, incorporating insights derived from Post-Keynesian macroeconomists, including Keynes, Davidson, Minsky, Kalecki, Lerner and Godley; from behavioural economists, including Simon, Tversky, Kahneman and Loewenstein; and from modern monetary theorists, including Mitchell, Mosler, Kelton, Wray, Tcherneva, Fullwiler, Forstater and Kaboub.

It requires that we live within our real and ecological constraints, achieving a much more even distribution of income and wealth within those constraints, with equitable full employment based on a well-designed job guarantee and a financial system designed to serve the needs of a sustainable economy, rather than one designed to promote inequality and financial fragility.

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It requires a new economics for sustainable prosperity. It will be my contention that this new economics already exists, that most of it has existed for a long time, that it is fit for purpose, and that we have no time to lose in replacing the old economics with the new and getting on with the job of delivering sustainable prosperity.

It requires a major 'jail break'[1] from what many of us were taught at school, or as university students. It requires us to really think through what we want to achieve and how we intend to achieve it; why the pursuit of sustainable prosperity is frustrated by an adherence to soft neoclassical economics; and what economic and philosophical framework we need to put in place of neoclassicism.

As R. H. Tawney said, long ago, in The Acquisitive Society (1920), 'Men may genuinely sympathize with the demand for a radical change. They may be conscious of social evils and sincerely anxious to remove them. They may set up a new department and appoint new officials, and invent a new name to express their resolution to effect something more drastic than reform, and less disturbing than revolution. But unless they will take the pains, not only to act, but to reflect, they end by effecting nothing. For they deliver themselves bound to those who think they are practical, because they take their philosophy so much for granted as to be unconscious of its implications, and directly they try to act, that philosophy reasserts itself, and serves as an over-ruling force which presses their action more deeply into the old channels'.

Positive Economics

The economics book we used at school, back in the late 1970s and early 1980s, was the fourth or maybe fifth edition of *An Introduction to Positive Economics*, by Richard Lipsey (1975). Lipsey's text was a market leader among the second generation of introductory economics textbooks, directly descended from Paul Samuelson's 1948 *Economics*.

As The Economist magazine put it, 'It is difficult to exaggerate the worldwide impact of Mr. Samuelson's economics'. I included the following quote from Samuelson in the first chapter: 'I don't care who writes a nation's laws — or crafts its advanced treatises — if I can write its economics textbooks'. I believe his book, and those which followed its approach to the teaching of economics, including Lipsey, and more recently Greg Mankiw, have played a far greater role in world history than any other school-level or introductory undergraduate text ever written in any subject.

The term 'positive economics' in Lipsey's title refers to the title of a paper by Milton Friedman, 'The Methodology of Positive Economics',[2] which laid down guidelines for the conduct and progress of the discipline, based on his interpretation of Karl Popper's scientific method, as applied to economics.

Friedman believed that, in a science of economics consisting of theories and models which make testable predictions, only the usefulness of those predictions should matter. Economists should not concern themselves with the realism of the axioms, or fundamental assumptions, on which their theories and models were based. He wrote that, 'the question whether a theory is realistic "enough" can be settled only by seeing whether it yields predictions that are good enough for the purpose in hand or that are better than predictions from alternative theories'. Criticism of a theory based on a lack of realism in its underlying assumptions was seen as 'largely irrelevant, and, in consequence, most attempts to reform economic theory that it has stimulated have been unsuccessful'. To Friedman, it did not matter whether households can and do knowingly maximise their utility, or whether firms can and do set their marginal revenues equal to their marginal costs, to maximise their profits. All that mattered was whether models based on such assumptions made useful predictions.

An alternative point of view is that simplifying assumptions must be used with caution and must always be justified.[3] Such justifications should be based on the ease with which those assumptions can be relaxed without disturbing the predictions of a model or perhaps the role of those assumptions in defining the circumstances under which the model is relevant to the real world. To an economist with an interest in institutions and in history, like Hyman Minsky, the notion that assumptions do not matter is a dangerous one. A model based on unrealistic assumptions may appear to make reasonable predictions during a period of economic stability, but when that stability is undermined, those predictions and that model are liable to be chimerical. Alan Greenspan's famous words, spoken in Washington, DC a month after the collapse of Lehman Brothers, come to mind. He admitted he had found a flaw in the laissez-faire, self-regulation approach to financial markets of which Friedman himself so approved. He said, 'I don't know how significant or permanent it is. But I've been very distressed by that fact'. Milton Friedman's positive economics is the soft economics I identified in my first chapter. It is not to be relied on. It is not a basis for a genuinely sustainable and equitable prosperity.

By the 1970s, for Friedman's successors, like Robert Lucas, it seemed obvious, to the point that no further justification was ever necessary, that absurdly unrealistic assumptions were to be preferred, since they allow you to build models which are more mathematically tractable and so easier to work with. This led to a super-soft form of economics. Over time, economists like Lucas and Friedman lost any remaining interest they might have had in realism, and in approaches to institutional design, individual and social psychology, economic history, and even the history of their own discipline, which were not rooted in and distorted by their definition of positive economics, and their strongly held beliefs about acceptable economic methodology.

All this was based on a misinterpretation of what is a wrong theory of science, at least where economics is concerned. The theories of Thomas Kuhn and Imre Lakatos[4] are far more applicable to economics than that of Karl Popper. While their arguments are not identical, they both stress the barriers in the way of scientific revolutions, or paradigm shifts, against entrenched theories. Orthodox macroeconomics has for many years been a classic example of what Lakatos described as a degenerate scientific theory, and its continuing dominance has been based as much on the sociology of the economics profession as on anything else. It long ago failed the Friedman/Popper test, in that, for example, financial crises such as that which became obvious in 2008 should simply not happen in a general equilibrium world. If the Global Financial Crisis is an 'anomaly' which orthodoxy has chosen to sweep under the carpet, which is more or less what has happened, then it is time to get rid of the carpet. I have been arguing for a shift to realism and to a modern form of the hard monetary analysis for which Post-Keynesians and institutional economists have been calling, for generations. We have to rescue Keynes, Kalecki, Minsky, Lerner and others from under the carpet. In doing so, we will rescue economics and can change the direction of the world economy.

Another feature of positive economics is its characterisation of economics as a 'values-free' discipline, like cosmology or biology. Lipsey's book made a distinction between positive economics and normative economics, with an indication that genuine economic science must be positive in its approach. It must be concerned with 'what is', rather than 'what ought to be'. By 'what is', it really meant 'what orthodox economic models predict is', bearing in mind the lack of interest in valid underlying assumptions in the modern neoclassical approach to doing

economics. According to this view, good economists are never influenced by their own values or opinions about issues which do not lend themselves to testable hypotheses. To be so influenced would disqualify you as an economic scientist. Values are for non-economists, and value judgements and priorities are for politicians.

The trouble with all this, of course, is that it is, at best, hopelessly naïve and at worst, dishonest. There is no such thing, for example, as a 'free market' and so no such thing as a 'free market economy' that you can study. There are always sets of formal and informal rules and regulations, and there are always institutions enforcing those rules. It just depends who sets the rules, and in whose interests, they are set. Similarly, there can be no such thing as a genuinely 'values-free' economics. Positive economics, if this is what it is supposed to be, does not and cannot exist. Economics is irredeemably normative, at least to some degree. Milton Friedman, in almost everything he ever did, was guided by his opinions about what ought to be, and his values shaped those things about the economy and the discipline of economics which he took for granted. The same thing was true of Adam Smith and John Maynard Keynes, but they never pretended otherwise. The same thing is true of you and me.

Economics Is Not Cosmology

I have used George Soros's term 'reflexity' before, and it applies here. When cosmologists study a distant galaxy, they are examining something over which they can never have any influence, whatever they do. Their scientific theories about the stars in that galaxy have no effect at all on the nature of those stars, or how they were formed, or on anything about them. In general, in the natural sciences, our beliefs and any decisions we make cannot normally change the fundamental nature of that which we are examining. The same thing is not true of economics.

It is not just in the design of markets and other institutions that economists, and those they advise, can change and have changed the nature of the economy we are trying to understand. Economists and politicians can change human nature. Our attitudes and preferences are not fixed. They are highly malleable. This includes, as I said in Chapter 4, our attitudes towards ourselves and others, and in particular to advantageous inequality, and what constitutes a just society.

All marketing professionals know that people are easily influenced, and that preferences are regularly newly formed and can be manipulated. All propagandists know that those with whom we identify, and our attitudes towards those we see as outside our social group, can be transformed. We have the capacity to develop a very wide range of beliefs and behaviours, and not all of them are consistent with peace and sustainable prosperity.

Economists ought to know this too. What most economists take for granted is socially determined and has been strongly influenced by icons like Friedman, who was himself a consummate politician, and by a variety of pressure groups and political movements. What politicians do is strongly influenced, and limited, by the economic advice they receive. What politicians and economists think, and how those educated by academic economists discuss issues, shapes the economic and social framework within which we live, changes our attitudes and in important ways changes the people we are.

Economists affect the economic system they claim to study in fundamental ways. Keynes did; Friedman did; Hayek did too, in so far as he influenced those around Margaret Thatcher and Ronald Reagan. Towards the end of the twentieth century, the ideas of Friedrich Hayek and those of Milton Friedman proved to be more influential than those of John Maynard Keynes. This deep level of reflexity has been a characteristic of the drive for a neoliberal form of globalisation over the past forty years.

So it makes no sense to compare economists to physicists or to cosmologists looking at distant star systems. The things economists take for granted help to shape society, as well as being passed down, perhaps in a more refined and extreme form, to the next generation of orthodox economists. Values-free, it is not.

The misleading of students has begun for millions of people down the decades at the very beginning of their first class in economics. Their teachers, along with the authors of all the leading post-war texts have, with virtual unanimity, started with more or less Lionel Robbins' statement that, 'Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses'. Even this apparently innocuous statement is biased. Not because it is wrong, but because it is incomplete. It is true enough that we as a species in 2018 have very scarce and rapidly dwindling ecological resources, which need

to be conserved and maintained, but which nonetheless we must continue to use, to promote human well-being. This is obviously not what Robbins was referring to, all those years ago, and it isn't generally what teachers of orthodox economists mean when they use his words today.

Robbins' definition biases the discipline towards the general equilibrium model which I have rejected as hopelessly misleading. If resources, including labour, are all presumed to be scarce, then we are adopting the full employment assumption and Say's Law, at least as a long-run truth, in Chapter 1 of our study text and on the first morning of our course.

A Sense of Purpose

Moreover, as Kate Raworth[5] has pointed out, a failure to specify appropriate ends for economic activity has left a gap which the maximisation of real GDP, and over time the maximisation of the rate of growth of real GDP, has come to fill. It is better to define economics as the study of the economy and to define the economy as the set of natural and fabricated resources, institutional arrangements, organisations and markets which are available to meet our needs and to influence our current and future well-being.

I gave my view as to the appropriate objective for economic activity and for those of us who work within the discipline of economics, in Chapter 1. It was the pursuit of genuinely sustainable, inclusive, prosperity. The Binzagr Institute advocates for 'decent employment opportunities for everyone ready, willing and able to work at a socially established living wage' and defines sustainable prosperity 'holistically, to encompass the physical, mental, environmental, financial, educational and civic well-being of all individuals, families, neighbourhoods, and regions throughout the world'.

To be more specific, I have argued for a job guarantee, providing everyone the option of secure and voluntary full-time or part-time employment, with just wages and working conditions. I have explained that such a job guarantee would be part of a programme to decrease income inequality over time, while also acting to anchor inflationary expectations and to stabilise the economy. It would act as a stabiliser by guaranteeing a more effective automatic counter-cyclical element to the fiscal balance, to hold the economy at non-inflationary full employment. I have explained that this could decouple the pursuit of full employment

from the pursuit of maximal growth in real GDP. It could help us to overcome our obsession with to real GDP growth, which, I showed in Chapter 7, cannot be proved to have added to human happiness or life satisfaction, at least in high-income countries, and which has pushed our economy beyond the carrying capacity of the one planet we have available to sustain us.

Kate Raworth uses a doughnut model to discuss the requirements for sustainable prosperity. All economic activity generates waste and uses a mix of renewable and non-renewable resources. We can never eliminate waste or stop using resources entirely. The greater the volume of economic activity, the more resources we use and the more waste we produce. The rate at which emissions of waste increase, due to increases in production and consumption, and the extent to which we use renewables and deplete non-renewables, depends on what we consume and on how we organise production. But there must always be some limit on the level of activity which can be maintained today without compromising the quality of life of future generations.

Raworth's doughnut consists of an inner circle, which describes the minimal resource use to provide people with a good quality of life today, and an outer circle, describing the maximum scale of economic activity which is sustainable in the long term. If a society lies inside its inner circle, there will be widespread absolute poverty; if it is located outside the outer circle, it will have an ecological footprint which is too large to be sustainable. Both circles can change in size over time—a more equal society can avoid absolute poverty at a lower aggregate level of economic activity, and a higher maximum level of economic activity might be sustainable if technological changes relax ecological and other resource constraints, for example by transforming our energy system and greatly reducing our emissions of carbon dioxide and other greenhouse gases. On the other hand, more inequality can shift that inner circle out, and today's emissions of carbon and other wastes can exhaust the capacity of the Earth to process such wastes and lead to accelerating climate change requiring a greatly diminished maximum level of activity to slow down and eventually reverse the damage.

Kate Raworth declares herself as an agnostic on real GDP growth, and we should take a similar position. It is uncertain how large a global economy can be maintained over time, and so it is uncertain how much, if any, additional growth in real GDP is ecologically sustainable. But ecological sustainability must come first—if it is the case that there is a

conflict between the growth of real GDP and the stability of our ecosystem, only a fool would choose the former over the latter. If that was the result of a study of economics, then David Suzuki would have been right to describe that form of economics as 'brain damage'.

Real GDP should be whatever it needs to be to provide equitable full employment today and ecological sustainability over time. Just as the fiscal balance should be whatever is necessary to maintain full employment and to avoid excessive inflation. Just as the trade balance should be wherever it needs to be to combine these objectives with a much more even distribution of income and wealth, and good public services.

Genuine Progress

I have tried to avoid referring to growth in real GDP as 'economic growth' in this book, out of respect for my former thesis supervisor and ecological economist, Philip Lawn. Phil's work is in the tradition of Kenneth Boulding and Herman Daly. It was Boulding, who said 'anyone who believes in indefinite growth of anything physical on a physically finite planet is either a madman or an economist',[6] and Daly, who pioneered the idea of a 'steady state economy', with economic development centred on qualitative improvements rather than continued increases in the scale of economic activity.[7]

Philip Lawn has always stressed what ought to be the obvious point that economic expansion has costs, as well as benefits, and that even an orthodox economist ought therefore to accept that there is some optimal scale of economic activity beyond which additional production is suboptimal. In other words, beyond that point, growth should not be described as 'economic', but as 'non-economic' (Lawn 2016). With his colleagues, Phil has built on the work of William Nordhaus and James Tobin, and others, including Herman Daly, to develop a more useful metric of sustainable development, which is now called the Genuine Progress Indicator (GPI).

The GPI adjusts changes in aggregate personal consumption for changes in income distribution and for a range of social, ecological and economic benefits and costs, relating to production and consumption activities, to derive a measure of economic progress expressed, like GDP, in monetary units. For example, estimates are included for the social benefits of voluntary and household labour, while the estimated cost of underemployment to those seeking paid work is also included. The costs

of various forms of pollution and carbon emissions are included, as are estimates of the social value of farmlands, forest and wetlands. Such an undertaking is unavoidably subjective, in terms of both the identification and measurement of relevant costs and benefits. Moreover, there is as yet no single, generally accepted approach to estimating the GPI. It can depend on the purpose to which it is being put and to the availability of data. At the moment, researchers led by Lawn are working on putting together a simplified global set of statistics, covering virtually all countries on a comparable basis, to monitor their progress against a reasonable definition of sustainable development over time.

It is easy to criticise the Genuine Progress Indicator because it is so subjective, but all this rather misses the point. The GDP statistic itself is not an entirely objective measure of the size of the economy, for reasons I won't go into here. More importantly, GDP was not even designed to be a measure of sustainable development, and consequently, a variety of activities which reflect social costs, rather than social benefits, add to GDP, rather than being subtracted from it. For example, if accelerating climate change leads over time to a big increase in defensive expenditure, to make life tolerable, that will add to GDP—just as spending on clearing up a major oil spill adds to GDP in a given year, and US government spending on maintaining a record prison population adds to GDP in the USA. Domestic production, whether it is creative to well-being, destructive of it or a consequence of previous costly activities, adds to gross domestic product.

There are alternative measures of social well-being to the Genuine Progress Indicator, including the United Nations Human Development Index and the Organisation for Economic Co-operation and Development Better Living Index. However, none of them is as well designed to focus the minds of policy-makers on a list of factors likely to form the basis of sustainable prosperity in the future. The GPI can and surely will be refined and improved upon, as better data become more widely available. However, it is already probably the best available basis for green national accounting. Every national statistical agency ought by now to be working towards its own GPI statistics, based on the work of people like Daly and Cobb (1989), and of Phil Lawn. In doing so, they will naturally concentrate on a similar list of factors to the U.N. sustainable development goals and the ecological boundaries highlighted by Kate Raworth.

A more sensible criticism of the Genuine Progress Indicator as a guide to present and future policy-makers is that we are apparently replacing one single dimension indicator—real GDP—for another—the GPI. I do not believe this is a fair criticism, because I see the GPI not as a single

indicator, but as a frame within which a list of economic, social and ecological indicators can be made to sit. It makes more sense to consider each of these indicators, and perhaps alternatives to them, one by one, but when dealing with policy-makers it is important to offer them a summary statistic which is easily understood, and which, for all its limitations, is likely to influence them in the direction of a set of policies promoting sustainable prosperity.

In the pursuit of sustainable prosperity, governments should encourage and participate in economic activities and innovations making a positive contribution to genuine progress, and discourage or in some cases forbid activities which reduce the GPI. The government itself is the best-placed institution in the economy to promote and, within the public sector, to carry out purposeful research and development, and to facilitate and encourage process and product innovations (Mazzucato 2013).

That sustainable prosperity must include full employment, though not necessarily for ever a long standard working week, or a long delayed retirement; a far lower level of inequality than we see around us in most countries today (Wilkinson 2006); and ecological sustainability. It has been my contention that a hard (i.e. realistic) monetary analysis of the economy is required to bring any of this about. The technique of stock-flow consistent macroeconomics discussed in Chapter 6 is an important tool, which can replace orthodox general equilibrium models, as a technical tool for macroeconomic analysis. That analysis itself must incorporate the axioms of modern monetary theory, and indeed, the modern macroeconomics of the next generation must be modern monetary theory.

Framing MMT

It is not enough to bring this about for modern monetary theorists to be technically correct. The initial reaction that modern monetary theory often inspires in orthodox economists, which I have seen many times close up, is emotional, aggressive, dismissive and far from measured and conventionally rational. It is not a calm and scientific response to the evidence. It is an emotional, system one response. Unsurprisingly, you often get a similar reaction from politicians and from many of the general public, for whom the distinction between currency issuers and currency users is often shocking, sometimes threatening and in many cases evocative of wheel-barrow loads of cash in early 1920s Germany, or gazillion dollar notes in Zimbabwe in 2008.

At least part of the problem relates to the associative and reference-dependent way in which we habitually evaluate new ideas and make judgements, heavily influenced by system one thinking and by sometimes inappropriate and misleading metaphors. It makes the framing of economic issues and, in particular, the way in which economic discussions are continuously and consistently framed by conservatives and neoclassical economists, so powerful and so difficult to shift (Lakoff and Johnson 1980).

Louisa Connors and William Mitchell,[8] and separately, Randall Wray, have drawn on the work of cognitive linguist, George Lakoff, to shed light on the most effective approach to framing modern monetary theory. According to Lakoff, 'Framing is not primarily about politics or political messaging or communication. It is far more fundamental than that: frames are the mental structures that allow human beings to understand reality – and sometimes to create what we take to be reality'.[9]

Lakoff's views should have been understood by Post-Keynesians and other heterodox economists long ago. There is no inevitable rejection of falsifiable theories, as in Karl Popper's theory of the scientific method, or triumph of progressive over degenerative research programmes, as in that of Imre Lakatos. The continuing dominance of orthodox neoclassical economics in the academies and in most policy-making institutions is about framing; about the effective use of metaphors to appeal to the 'embodied mind' and comfortable, system one thinking; and the clarity and relative consistency of neoclassical ideas in that context.

Modern money theory outperforms orthodox neoclassical macroeconomics in both descriptive and predictive terms—it has already won the scientific contest. However, it could still fail the metaphorical test and the test of mimetic competition. Both Wray, and Connors and Mitchell, explain how the apparently counter-intuitive descriptions and predictions of modern money do not fit well with the comfortable but misleading neoclassical metaphor of 'government as household'.

Randall Wray quotes Lakoff, discussing the use of framing by conservatives, as follows: 'They understand the importance of morally-based framing, the importance of not using the opposition's language, and the importance of an extensive communication system that operates daily everywhere…Everything you understand is a matter of framing. And what counts as a fact depends on the frame used in understanding'.

Connors and Mitchell also stress the deliberate use of framing by the conservative side of politics, to transform a financial crisis caused by private debt and financial fragility fed by a long period of financial

deregulation into a mythical problem of excessive regulation and too much government. 'The resurgence of the free-market paradigm has been accompanied by a well-crafted public campaign where framing and metaphor triumph over operational reality or theoretical superiority'.

They list a series of examples of effective and intentionally misleading neoclassical metaphors, relating to: (1) government spending ('spending like a drunken sailor'); (2) the fiscal balance ('budget black hole'); (3) government debt ('mortgaging the future'); and (4) income support (where 'working families' are the paragon for comparison). They stress the importance of language and of the deliberate and purposeful use of metaphors by progressive economists. They discuss the need to establish the sort of outcomes we desire collectively from our economy and the subsequent need to frame policy discussions with care so that we emphasise our ability to change the economy to deliver those outcomes. The use of language, which effectively communicates economic realities, and the need to avoid misleading conservative frames are essential.

They emphasise the need to frame policy proposals in terms of their impact on people and the planet, rather than on an entity called 'the economy'. This emphasis on the purposes of policy proposals must be supported by the use of appropriate language. They question the use of the term 'spending' in the context of a sovereign government, since to 'spend' implies to use up. They prefer the more positive term 'government investment' to achieve public purposes.

There might even be a justification for going beyond this, and avoiding terms like government (or public or, even more so, national) debt and government (or budget) deficit at all, for a monetary sovereign. The word 'debt' implies something which needs to be paid back and evokes possible bankruptcy. Monetary sovereigns never need to pay back their debts in their own currency. Nor do they need to issue debt, and they cannot go bankrupt. The appropriate metaphor for sovereign government 'debt' is 'money'. The term 'deficit' implies a shortfall or a lack of resources. Governments will normally be in 'deficit' and are not financially constrained, and a deficit in no sense involves a shortage of anything. As we know, a monetary sovereign cannot run out of money. Again, the term is misleading. A government deficit could be termed a non-government financial surplus or alternatively a government net injection. There is every reason to abolish the concept of sovereign government debt and to replace it with a form of 'broad, outside' money.

Talk of 'balancing the budget' is also misleading, since it implies a state which can be actively achieved without adversely affecting the operations on the economy and the public purpose. It also obscures the considerable endogeneity of the government financial balance. References to government 'saving', or a definition of national saving that includes a fiscal surplus as an element in national saving, are misleading. To save is to set aside current resources, in order to maintain or facilitate higher levels of future consumption. A fiscal surplus does neither the first nor second of these things and in fact decreases (dollar for dollar, as Warren Mosler puts it) the ability of the non-government sector to net save.

Other terms with a hidden bias towards neoclassical mythology include 'fiscal consolidation', 'adjustment', 'reform' (in the context used by neoclassical economists), 'rationalisation', 'incentives' (again, in a neoclassical context), 'doing more with less' and even 'taxpayers' money'. Just using these terms, in the context they are generally employed in economic debates, buys into the neoclassical paradigm as a broad meme. If such language is to be used at all by progressives who understand modern money, it should be with care and with the utmost attention to the framing of economic debate.

There is a tension, however, between the introduction and use of more positive and less misleading terminology, as part of a movement to construct a better meme for economic policy, to help bring about the necessary paradigm shift in economics; and the need to communicate not only with neoclassical economists, but also with fellow heterodox economists, politicians and the public—most of whom are as accustomed to biased economic language as they are to the 'qwerty' keyboard.

Nevertheless, our use of language is important, and whether the benefits of continuing to use economic terminology drawn from the neoclassical school outweigh the serious problems this causes is worth debating. Just as institutions can be changed, so can terminology. If both our economic institutions and our terminology can be changed to make it easier to pursue and maintain economic policies consistent with sustainable prosperity, we should change them. Whatever else we do, 'progressives should avoid debating within the frames that the conservatives use' (Mitchell 2015, 327).

Towards an Economics for Sustainable Prosperity

Modern monetary theory is an essential part of a new economics for sustained prosperity, but of course it is not the whole story. Realistic behavioural foundations are needed to guide us towards policies and institutions suited to providing people with the best possible opportunities for fulfilled and rewarding lives, and a sense of well-being. A proper respect for our ecological constraints and the well-being of future generations, and of the need to locate our economic and other activities within our planetary boundaries, is urgently required (Galbraith 2014). But to do this, so that we can build a future of genuinely sustainable and shared prosperity, we need to get our macroeconomics right, which means we need to understand how monetary systems operate, and how they can be made to operate for the public good.

In a number of ways, modern monetary theory continues to make progress:

- Due to a persistent consistency with the evidence.
- Through an expansion of interest outside the economics profession and the policy establishment, facilitated to a considerable extent by social media and the efforts of academic and non-academic bloggers and activists, and also by public presentations and interviews made by leading modern monetary theorists.
- Through a continuously expanding set of scholarly publications.

There remains a need for a greater number and variety of accessible book-length presentations of the economics of modern monetary theory and related areas of economics and of other disciplines. This book has been a contribution towards meeting that need.

It is up to those who have understood the potential implications of modern monetary theory for public policy and the urgency with which a radical change of policy direction is required, not only in the USA, but also in many countries worldwide, to add their voices to those who are already calling for dramatic change. Change is needed, not only in the discipline of economics, but also and more importantly in the actions of governments. What has for generations been the orthodox approach to macroeconomic

theory, and has set the frame for policy-making, has failed us and will continue to fail us, until we make those changes. In an ecological sense, we are rapidly running out of time. Change is long overdue.

I would like to return at this point to these words of Hyman Minsky—'The game of policy-making is rigged; the theory used determines the questions that are asked and the options that are presented. The prince is constrained by the theory of his intellectuals.' We must unrig the game. We must get the theory right. We must ask the right questions. We must insist on options being followed which give us the best chance of sustainable prosperity. We must break out of the neoliberal jail.

'We believe that providing decent employment opportunities for everyone ready, willing and able to work at a socially established living wage is an institutional prerequisite for social justice and sustainable prosperity. "Sustainable prosperity" is conceived here holistically, to encompass the physical, mental, environmental, financial, educational and civic wellbeing of all individuals, families, neighbourhoods, and regions throughout the world'.[10]

Notes

1. Bill Mitchell has said those in the Eurozone need a 'jail break' if they are to restore widespread prosperity. The whole world needs a jail beak from neoclassical economics and especially neoclassical macroeconomics, and the sooner, the better. This is a challenging goal. As Keynes explained long ago, escaping these old ideas—and the core principles of neoclassical economics are now very old indeed—is the problem. We have plenty of new ideas to take their place, if we can only engineer the jail break.
2. In Friedman (1953). Paul Samuelson described Friedman's view that unrealistic assumptions were essential to good theory as the *F-twist*.
3. A discussion of the reasons why assumptions matter in economics, and an antidote to Friedman's *F-twist*, is provided in Keen (2001, Chapter 7).
4. Lakatos (1970).
5. In her excellent *Doughnut Economics* (Raworth 2017). The only inappropriate hole in the doughnut being the absence of a modern monetary theory perspective on the monetary system and economic management.
6. Boulding is said to have used these oft-quoted words in Congressional hearings in 1973.

7. Daly (1996).
8. Connors and Mitchell (2017) and Wray (2012).
9. Lakoff (2006, 25).
10. These words form part of the welcome message on the home page of the *Binzagr Institute for Sustainable Prosperity*.

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Index

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