CAPITALISM VERSUS PRAGMATIC MARKET SOCIALISM

Capitalism versus Pragmatic Market Socialism

A General Equilibrium Evaluation

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To Penny For always being there

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About the Author

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Introduction and Overview

In the latter 1930s, Oskar Lange published a lengthy essay, entitled On the Economic Theory of Socialism, which endeavored to introduce the notion of market socialism to the economics profession as an explicit alternative to the only type of socialism then widely recognized: the centrally planned model utilized by the Soviet economy. The Langian market socialist concept became widely known within the profession primarily as a result of Abram Bergson's 1948 essay on "Socialist Economics," included in the Survey of Contemporary Economics sponsored by the American Economic Association. Bergson's lukewarm 1948 evaluation of Langian market socialism profoundly influenced subsequent thinking, as may be judged from the numerous comparative economic systems textbook treatments of market socialism which virtually paraphrase Bergson's 1948 discussion. It is generally believed that the lack of an observable success criterion constitutes a fatal flaw in the Langian proposal, and that any effort to implement Langian market socialism in the real world would probably produce stagnation and decay.¹

Although the specific plan of market socialism advocated by Oskar Lange has been effectively neutralized by various objections, Lange's work created a legacy that may yet prove significant. That legacy is simply widespread acceptance of the notion of "market socialism." Prior to Lange, it was generally believed, both by pro-socialists and anti-socialists, that socialism necessarily implied some form of comprehensive planning and was therefore fundamentally antithetical to the market. Lange's proposal suggests that a viable and legitimate economic market might be no less feasible under socialism than it is under capitalism.²

Following upon Benjamin Ward's seminal 1958 paper on the cooperative firm, there occurred a tremendous outpouring of theoreti-

cal work on this topic.³ As a result, specialists in comparative economic systems have become very familiar this variant of market socialism, and current textbooks in the field normally discuss it in some detail along with Langian market socialism. The notion of cooperative production of course long predates Ward's 1958 paper. Orthodox economists generally regarded the idea with serious reservations. Casual empiricism, which seems to indicate the usual failure of cooperative enterprises in competition with capitalist firms, suggested (and still does suggest) that in the absence of an outside ownership interest to discipline the labor force, economic efficiency and performance will tend to be inferior. The enormous theoretical literature produced by numerous economists since 1958 has tended to reinforce the traditionally lukewarm appraisal of the concept. Starting with Ward's "perverse" supply curve of the coop, the literature has tended to focus on a host of "problems" with cooperative enterprise. The practical verdict is the same as that on Langian socialism: it is widely believed that any effort to implement cooperative market socialism as the standard principle of economic organization in the real world would probably produce stagnation and decay.

While it could well be that the generally prevalent judgments in the economics profession on Langian market socialism and cooperative market socialism are unduly negative, these judgments will not be questioned here.⁴ However, to conclude that the general concept of market socialism is deficient, on the basis of the putative deficiencies of only two specific variants of the general concept, is clearly unwarranted. In a survey article on market socialist forms published in Annals of Public Cooperative Economy in 1975, I described and briefly evaluated four specific variants of market socialism which are discernible as clearly distinct entities in the critical literature on capitalism: Langian market socialism, service market socialism (i.e., nonprofit production), cooperative market socialism, and pragmatic market socialism. Since then, Leland Stauber, in articles published in 1975 and 1977 and a book published in 1987, has added a fifth variant, which might be described as regional ownership market socialism.

In the considered judgment of the author, out of these five variants of market socialism, that one which is by far the most attractive *in a*

practical sense as an alternative to contemporary capitalism is pragmatic market socialism. Much of my professional effort as an economist over the last twenty years has been devoted to the elaboration of this plan of market socialism. This work has resulted in a considerable number of articles, much of the content of which has recently been summarized in a book-length study: Socialism Revised and Modernized: The Case for Pragmatic Market Socialism (1992). This body of material explicates various aspects of the pragmatic market socialist proposal, and evaluates the potential performance of the system in a generally favorable light. The present contribution may be regarded as a technical supplement to the mostly nontechnical Socialism Revised and Modernized. It develops a simple general equilibrium model for the purpose of quantitatively evaluating the potential performance of a pragmatic market socialist economy in relation to that of the contemporary capitalist economy. This initial chapter will provide some background on the pragmatic market socialist idea, and then provide an overview of the study.

Underlying the pragmatic market socialist proposal is the judgment that insofar as large, industrialized, capitalist nations such as the United States and the nations of Western Europe are concerned, the market capitalist economy is achieving a fully satisfactory level of efficiency. But even so, the contemporary capitalist economic system is still socially unacceptable because of the inequity—seemingly permanent in nature—of a highly unequal distribution of unearned property return. The pragmatic market socialist economy would exactly mimic the existing market capitalist economy in practically every significant respect. The very close parallel to market capitalism is motivated by a strong concern to maintain the present satisfactory level of economic efficiency. Only the minimum institutional alterations would be undertaken which are necessary to effect the goal of substantially equalizing the distribution of unearned property return.

The distinction between pragmatic market socialism and most other types of socialism, both market oriented and centrally planned, is that the other types proceed from the judgment that the present level of economic efficiency in the United States, Western Europe, and elsewhere, *is unsatisfactory*. Thus, the purpose of socialism is perceived to embrace significant efficiency objectives as well as equity objectives. This concern for efficiency motivates relatively drastic proposed changes away from the present institutional status quo under capitalism.

Thus, for example, centrally planned socialism involves direct national government intervention in microeconomic production and pricing decisions of individual firms. This is perceived to be a means of curbing the various inefficiencies and illogicalities stemming from the "anarchy of the market." Oskar Lange, the initial developer of the concept of market socialism in Western economics, was concerned, as a theoretical economist, that profit maximization by imperfectly competitive firms would violate the textbook efficiency principle MC = p. He thereupon proposed the abrogation of profit maximization and its replacement by direct guidance of production by the textbook efficiency principle. Proponents of cooperative market socialism, such as Jaroslav Vanek, speculate that the feeling that they are working for themselves rather than for capitalists will inspire the labor force of each firm to new heights of effort and productivity.⁵

Despite the best efforts of proponents of these socialist schemes, the fact remains that none of the above arguments is found to be convincing by the vast majority of contemporary mainstream economists. Central planning socialism is believed to stifle initiative and flexibility; Langian market socialism is believed to be devoid of an observable success criterion; cooperative market socialism is believed to lack adequate centralization of authority within the enterprise.

In contrast to these other socialist viewpoints, the emphasis on equity rather than efficiency in the pragmatic market socialist viewpoint enables an institutional proposal that would differ only in very minor respects from the present situation. The core of the pragmatic market socialist proposal involves only two changes: (1) national government ownership (through an agency that will be designated herein the Bureau of Public Ownership) of large-scale, established business enterprises; (2) the distribution of property return produced by large-scale production, both by business and government, to the citizen body on the basis of earned labor income (the "social dividend" principle) rather than on the basis of financial asset ownership. The Bureau of Public Ownership—the only new agency required by the pragmatic market socialist proposal—would carry out two functions, in line with the above changes: (1) to take over the positive function of private capital ownership in the economy by enforcing upon the corporate executive corps a strong competitive profit-seeking motivation; (2) to receive property return from largescale, established business enterprises and government agencies, and to disburse the large majority of it to the general public as a social dividend income supplement individually proportional to wage and salary income.

These changes would imply only the following alterations in the conditions under which individuals function in the economy. Corporation presidents (of large, established corporations) would be subject to the authority of BPO personnel rather than to the authority of boards of directors elected by private stockholders. However, the primary concern of the BPO personnel would be exactly the same as the primary concern of the boards of directors: that each corporation be producing a satisfactory amount of property return. Private households would no longer receive property income on their personally owned financial assets. However, to compensate for this loss, they would receive a social dividend income supplement proportional to their earned labor income.

The present study examines the potential relative performance of a pragmatic market socialist economy using a small-scale general equilibrium model. The model attempts to incorporate the primary institutional differences between capitalism and pragmatic market socialism. It is numerically implemented and solved over a range of parameter values. Results from the model suggest that the numerical value of a parameter designated herein the "output elasticity of capital management effort" is critical to the relative performance question. If this parameter is a numerically low value, then pragmatic market socialism out-performs capitalism in a social welfare sense; if this parameter is a numerically high value, then capitalism out-performs pragmatic market socialism. Although a tentative estimate of this parameter based on data from the 1971 Purdue University Individual Investor Survey is utilized herein as a benchmark value, the fact remains that at this point in time the actual value of this parameter, even presuming it represents a valid theoretical representation of a real-world analogue, is highly conjectural. But it is hoped that the methodology of this study may provide some useful insights into the technical investigation of a question, that of the probable relative performance of capitalism and market socialism, to which proposed answers have ordinarily been motivated by little more than subjective judgment.

The following is a schematic outline of the study:

Chapter 2: Pragmatic Market Socialism

2.A. The Proposal. To lay a proper basis for the substantive research reported in the following, it is necessary to provide a brief sketch of the essential institutional aspects of the pragmatic market socialist proposal. Following a brief discussion of transition and compensation (in which some emphasis is put on the fact that entrepreneurial business enterprises would be exempted from public ownership), the social dividend and the Bureau of Public Ownership are described. All capital property income paid over by publicly owned business enterprises to the Bureau of Public Ownership, less a modest "retention percentage," would be distributed to the working population as a social dividend income supplement proportional to each household's labor income. The Bureau of Public Ownership, assigned the task of evaluating the performance of corporation executives in terms of the long-term profitability of their respective corporations, would be a two-tiered agency in which the central office would be supplemented by a network of local offices, each of which would be staffed by 10 to 15 individual BPO agents. The power of dismissal of corporation executives would be delegated to these individual agents, under certain limitations. Finally, the institutional proposal is rounded out by two agencies concerned with investment and entrepreneurship: the National Investment Banking System and the National Entrepreneurial Investment Board. These agencies would supplement and not replace the investment and entrepreneurial activity undertaken by regular financial intermediaries and individual entrepreneurs.

2.B. Pros and Cons. This section of Chapter 2 explains and responds to the three principal economic objections that may be lodged against the pragmatic market socialist proposal. First, the small proportion of capital property return retained by the Bureau of

Public Ownership might constitute an inadequate incentive to capital management effort provided by its personnel. As a result, capital productivity and overall economic performance might be substantially less under pragmatic market socialism. This possibility is examined through the medium of a small-scale partial equilibrium model of the representative capital manager, and various possibilities are enumerated under which the drastic reduction of the "retention coefficient" as between capitalism and pragmatic market socialism would not seriously reduce capital management effort and capital productivity. One of the most important of these possibilities is the "plateau" configuration in the production function relating capital management effort to the rate of return on capital. The second principal objection holds that private household saving would be substantially lower under pragmatic market socialism. Finally, the third objection holds that owing to the advance of "people's capitalism" in the real-world modern capitalist economy, the benefit from reduced inequality in the distribution of capital property return would be insignificant. Following a critical analysis of these three objections to pragmatic market socialism, this section is concluded with a brief indication of how the results obtained from the general equilibrium analysis bear upon these issues.

Chapter 3: A General Equilibrium Model

3.A. Theoretical Specification. Two variants of a general equilibrium model are specified, both based on the same production function, utility function, and set of behavioral assumptions. The production function is a Cobb-Douglas form in the three primary factors of production: physical capital, labor, and capital management effort. The utility function is a Cobb-Douglas form in the three goods: consumption, leisure, and effective assets (the last being a construct based upon nominal assets, i.e., capital wealth). The behavioral assumptions are the standard presumptions of neoclassical economic theory: profit maximization by the business sector, and constrained utility maximization by the household sector. The model postulates a single aggregated "firm" in the production of final output, but is disaggregated into ten households ("deciles") on the household side. There are two sources of household income inequality under the capitalist variant: differences in household labor productivity, and

differences in household financial assets. Under the pragmatic market socialist variant, inequality in household financial assets no longer contributes to income inequality since there is no return paid on these assets. In both variants of the model there is a tax and welfare system through which market income is redistributed. In the capitalist variant, each household provides all three primary factors of production: labor, saving (from which physical capital is derived), and capital management effort. In the pragmatic market socialist variant, households specialize: non-BPO households provide labor and saving but no capital management effort, BPO households provide capital management effort and saving but no labor. BPO households are assumed to be drawn exclusively from the first (highest productivity) decile household.

3.B. Numerical Implementation. Benchmark numerical values of the parameters are specified in this section. Parameters pertaining to the distribution of labor productivity and capital assets are developed from a combination of empirical data together with hypothetical specification based on a cumulative distribution function. The empirical basis is data contained in the Federal Reserve Board Survey of Financial Characteristics of Consumers (1966). The method for hypothetical specification of capital asset distributions enables convenient exploration of consequences of lower inequality in this distribution than that specified in the benchmark case. Utility function parameters are set by calibrating them to produce reasonable solution values for household labor and saving. The social choice parameter governing the degree of redistribution is set on the basis of observed government spending in the United States. By far the most important parameter, on the basis of solution results reported below, is the output elasticity of capital management effort. Using data from the 1971 Purdue University Survey of the Individual Investor, an empirical basis is established for the benchmark value of this parameter. However, this empirical basis is far from compelling, necessitating sensitivity analysis of the consequences of variation in this parameter away from its benchmark value.

Chapter 4: Results

4.A. Benchmark Solutions. Using the benchmark parameter values, strong indications are found of superior performance by

pragmatic market socialism relative to capitalism on the assumption that the shortfall in private saving is compensated by an equal increase in the level of public saving. The superiority of pragmatic market socialist performance holds with respect to the output level (higher than under capitalism), the degree of consumption inequality (lower than under capitalism), and the level of the Benthamite sum of utilities social welfare measure (higher than under capitalism). This superiority also holds over the entire tested range of the redistribution parameter: at any particular level of redistribution, the pragmatic market socialist economy does better than the capitalist economy. This means that the downward-sloping equity-efficiency tradeoff function (the relationship between output and consumption equality) under pragmatic market socialism is higher than the equivalent function under capitalism, and similarly that the domeshaped social welfare function (sum of utilities as a function of the redistribution parameter) is higher under pragmatic market socialism than the equivalent function under capitalism.

4.B. Sensitivity Analysis. Results are reported here for variations in the following parameters: the utility function parameters, the degree of inequality in the capital asset distribution, the amount of compensation of socialized investment assets, the proportion of the social dividend fund under pragmatic market socialism distributed in the form of an equal flat-rate subsidy to each household, and the output elasticity of capital management effort. Only in the case of the elasticity of capital management effort does the variation in the parameter value have a profound, qualitative impact upon the substantive conclusions derived from this research. It is shown that if the value of the output elasticity of capital management effort rises beyond a certain point, then the social welfare performance of the pragmatic market socialist economy becomes inferior relative to the social welfare performance of the equivalent capitalist economy. The key implication of the model results is therefore that the question of the relative performance of pragmatic market socialism is fundamentally an empirical question and not a theoretical question: it depends on a parameter whose numerical value is, at this point in time, highly conjectural. This section is concluded with an extended discussion of the appropriate distribution of social dividend under pragmatic market socialism: what part should be distributed as a labor income supplement, and what part should be distributed as a flat-rate subsidy? The benchmark solutions involve distribution of social dividend entirely as a labor income supplement, and the sensitivity results discussed here support this policy principle.

Chapter 5: Conclusion

The final chapter of the study summarizes the results and evaluates their significance. A number of potential objections to the research are considered, ranging from technical objections to the model and its numerical implementation, to more general issues regarding the degree to which the general equilibrium model does or does not successfully incorporate the key real-world economic processes and conditions bearing upon the potential performance of a hypothetical pragmatic market socialist alternative to contemporary capitalism. Particular attention is paid to the Austrian school critique of socialism on dynamic performance grounds. While it must be conceded that there are clearly numerous drawbacks and shortcomings of the research reported here, it is argued that such drawbacks and shortcomings are inevitably to be found in any effort to apply economic theory to real-world policy issues. Any results from such efforts must certainly be considered merely as partial evidence, to be taken into account along with other types of less formal evidence bearing on the problem. That much said, it is concluded that the results obtained from this research constitute worthwhile and important evidence in favor of the viability and attractiveness of the pragmatic market socialist alternative to contemporary capitalism.

Pragmatic Market Socialism

A. The Proposal

Although it is clear from simple observation that the capital property income received by individuals under contemporary capitalism is not earned by the same sort of direct and evident labor which earns wage and salary income, in response to the socialist challenge a variety of justifications for property income have been developed. The most important of these revolve around the contention that property income is in some legitimate sense an earned return. It may be argued that capital property income is a return to capital management effort, either in the form of corporate supervision such as might be performed by a member of a corporation's board of directors, or in the form of investment analysis, such as might be performed by an investor or an entrepreneur in evaluating a range of capital investment opportunities. It may also be argued that capital property income is a return to saving, and compensates the saver for that personally stressful postponement of consumption which makes available valuable capital investment resources to business firms and government agencies.

The pragmatic market socialist proposal, obviously, is based on a skeptical attitude toward these and other proposed justifications for the present distribution of property return under capitalism. That category of human labor most naturally interpreted as corporate supervision, namely the administrative work of corporation executives, is already treated as labor income in conventional accounting. Apparently successful investment analysis is currently performed, for relatively modest salaries and bonuses, by the loan officers and investment analysts of the institutional investors. Saving represents a purchase of security, flexibility, and future consumption, and some of it at least would doubtlessly occur in the absence of interest and other forms of property income. The effect of the rate of property return on the level of private saving is theoretically ambiguous, but even if the termination of property return payments on savings accumulations were to reduce the rate of private saving, the shortfall could readily be replaced by public saving out of tax revenue. These considerations suggest that far from being an earned return to a socio-economic contribution, under contemporary institutional conditions property income is in fact an unearned income akin to a Ricardian rent, whose highly unequal distribution among the population is determined mostly by the institution of inheritance in conjunction with random variations in capital asset values.

Skepticism regarding the legitimacy of the present distribution of capital property return under capitalism motivates consideration of a market socialist alternative. However, in light of the relatively high levels of material prosperity presently enjoyed by the populations of advanced capitalist nations such as the United States, the utmost caution and conservatism needs to be observed in developing the institutional details of such an alternative. The pragmatic market socialist proposal is distinguished from the two better-known market socialist plans, Langian market socialism and cooperative (or labormanaged) market socialism, by envisioning relatively modest institutional alterations. In contrast to Langian market socialism, it does not envision replacing the profit maximization incentive by a marginal cost pricing rule. In contrast to cooperative market socialism, it does not envision replacing outside control over the typical business enterprise by employee control. Rather it envisions corporation executives motivated by a profit maximization incentive under conditions of a rivalrous competitive process, and subject to a form of outside control analogous to that currently exercised by boards of directors representing private owners.

The essential difference between capitalism and pragmatic market socialism is that the economic role, performed under the former system by a class of private capital owners, would under the latter system be performed by a national government ownership agency tentatively designated the Bureau of Public Ownership (BPO). This government agency would be responsible for establishing a method of performance evaluation and reward for the corporation executives which would tend to produce a viable long-term profit maximization incentive among them. In recompense for their efforts toward this end, the personnel of the BPO would be permitted to retain a relatively small fraction of the property return paid over to the agency by the publicly owned business enterprise sector in recognition of its ownership rights, a fraction almost certainly not to exceed five percent. The balance of property return would be distributed to the general public in the form of a social dividend payment individually proportional to labor income.

In this first section of Chapter 2, the main institutional features of the pragmatic market socialist proposal will be described under four headings: Transition and Compensation, The Social Dividend, The Bureau of Public Ownership, and The Investment Mechanism.⁶ This description will be followed, in the second section of this chapter, by a brief sketch of the various economic objections that may be made to the proposal, along with their various rebuttals. The economic objections to the proposal will be categorized under three main headings: Capital Management, Saving, and People's Capitalism. Concluding this general analysis of the pros and cons on the pragmatic market socialist proposal will be a brief analysis of the contribution made by the substantive general equilibrium research reported in Chapters 3 and 4 below to the technical assessment of the pragmatic market socialist alternative to capitalism.

Transition and Compensation. The implementation of pragmatic market socialism would involve the transfer to public ownership of most privately owned income-producing capital investment assets such as corporate stocks and bonds, as well as government bonds and notes, and the termination of real interest payments on other financial assets such as bank time deposits. The overall objective would be to terminate the receipt of income flows based on ownership of financial assets. However, at least two important exceptions would exist to the general principle of abolition of interest payments on the financial assets of private households. First, banks and other financial intermediaries would be required to pay a rate of compound interest on savings deposits equal to the current rate of inflation in consumer goods. This would be for the purpose of maintaining the real value of savings accumulations against inflation. Second, financial intermediaries such as pension funds holding private savings accumulations intended for the provision of retirement income would pay a competitively determined compound interest rate into these accumulations. This would maintain the present situation with respect to retirement income, and would reduce the current saving rate required of private households to achieve any given retirement income goal.

Two types of business enterprise would remain in private ownership under pragmatic market socialism: small business and entrepreneurial business. All privately owned businesses would, however, be subject to a capital use tax, payable to the Bureau of Public Ownership, designed to appropriate the purely rental component of their profits. The capital use tax would be equal to the average rate of profit on business physical capital in the economy, and would be assessed on the net value of such capital privately owned by the owner-manager. The probable inefficiency of public ownership of a myriad of small businesses need not be argued, but some comment is desirable on the matter of private ownership of entrepreneurial businesses.

The exception from public ownership with respect to entrepreneurial business is motivated by the possibility that private entrepreneurial endeavor might play an important catalytic role in the dynamic performance of the economy. While it is evident that the great majority of real-world investment and innovation is undertaken by established firms in the modern economy, there have been many examples in modern business history of an apparently beneficial catalytic impact of private entrepreneurial activity. It is intended that overall entrepreneurial activity be encouraged under pragmatic market socialism via the National Investment Banking System (NIBS) and the National Entrepreneurial Investment Board (NEIB), described below. But some economists might be dubious about "institutionalized" entrepreneurial effort. While it is fully possible that the significance of private entrepreneurial activity is exaggerated to the point of mythology in capitalist apologetics, there is sufficient plausibility that this activity is indeed important to merit an exception to the general principle of social ownership of business enterprise.

Publicly owned financial intermediaries would not merely be permitted, but would be actively encouraged, to lend large amounts of financial capital to entrepreneurial business enterprises founded by private individuals. As long as the founder-owner remains personally active as the chief executive of an entrepreneurial firm, it would remain privately owned no matter how large and successful it becomes. The transition to public ownership would normally occur when the founder-owner voluntarily departs from the management of the firm following upon its sale to an established publicly owned firm. This is indeed already a common pattern under capitalism: a founder-owner builds up an entrepreneurial enterprise, and then realizes its capitalized value as personal gain by selling it to an established firm. As this common pattern of private entrepreneurship would essentially be duplicated under pragmatic market socialism, private entrepreneurship under pragmatic market socialism would be as prevalent, and as significant to the economy, as it is under contemporary capitalism.

Adequate financial compensation would be provided for surrendered investment assets, and great care would be taken to avoid any expropriation of asset accumulations derived directly from the personal labor income of the owner. At the same time, it is not regarded as either legally or morally obligatory to compensate fully that value of investment assets representing appreciation since initial acquisition out of labor income, or representing initial plus appreciated value of inheritances. Because the larger capital wealthholdings almost invariably involve some combination of inheritance and appreciation, the percentage of capital wealth compensated would, as a rule, decline with the wealth level. However, the compensation schedule would be sufficiently generous to avoid imposing excessive hardship on individuals previously dependent mostly on property income.

All compensation would be in the form of cash rather than interestbearing government securities. The latter form of compensation has been the general rule with the various "nationalizations" of the past in Western Europe and elsewhere. But the purpose of pragmatic market socialism is not to replace profit maximization with socially specified objectives as the operative criterion for business management. It is rather to equalize the distribution of capital property return. Replacing private stocks and bonds with government bonds would tend to preserve and perpetuate the maldistribution of capital property return currently witnessed under capitalism. The inflationary propensities of cash compensation of surendered capital instruments would be restrained by the fact that this would not represent pure cash creation but rather a transfer of assets, and also by the fact of partial compensation of large-scale wealthholdings.

The Social Dividend. In a practical political sense, one of the most effective objections to socialism is that hard-working and deserving people would no longer receive interest income and other forms of property income on their accumulated savings. The pragmatic market socialist proposal meets this argument directly by means of the proposed social dividend distribution of capital property return. It is vital to the practical feasibility of the proposal that the capital property return received by the Bureau of Public Ownership be directly returned to the population via social dividend-and not incorporated into overall government revenues. Most people at the present time regard it as a serious liability of socialism that it would deprive them of property income—this liability can only be properly countered by putting this income flow directly into the pocketbooks of the people through a direct social dividend disbursement of capital property return to the people. Public support for a socialist transition would be very difficult to obtain if opponents of the transition were able to charge that under socialism, property return would "just go to government bureaucrats."

Following the transition to pragmatic market socialism, the Bureau of Public Ownership would receive property income on those investment assets currently owned by private households under capitalism. In addition, the BPO would receive receipts from the capital use tax on privately-owned small and entrepreneurial businesses. By law, the BPO would be obliged to disburse the large majority of the property return it receives to the general public as social dividend income. The benchmark figure frequently cited in my own past writing on pragmatic market socialism is a minimum of 95 percent social dividend distribution, implying a maximum 5 percent "retention percentage" by the BPO.

The two central questions with respect to the social dividend under pragmatic market socialism are as follows: (1) What part of the population would receive more social dividend income than they currently receive property income? (2) What percentage of his or her labor income would the individual citizen receive in the form of social dividend income? Precise answers to these two questions require numerous debatable assumptions. However, it is safe to answer "at least a large majority" to the first question: in all probability, a majority of well over 90 percent of the population (see below, pages 35-36).⁸ With respect to total social dividend income available for distribution as a percentage of total labor income, even taking practically every conceivable deduction into account, the social dividend percentage would almost certainly be a minimum of 5 percent, and it could certainly be substantially higher than that. These are, of course, very significant numerical indications—that is, potentially at least (if they were more widely known and appreciated).

The Bureau of Public Ownership. The fact that the proposed BPO is not a purely passive agency which would simply collect and disburse property income indicates that it is accepted that capital owners may make some positive economic contribution which needs to be maintained. But under pragmatic market socialism, the BPO's role would consist principally of performance evaluation of corporation executives on the basis of observable profit indicators, and furthermore, the BPO would be legally required to disburse the large majority of the property income it receives to the general public as a social dividend. These provisions manifest the fact that the positive economic contribution of the capital owners under capitalism is not perceived in the same exalted light that it is by capitalism's defenders. This ideologically rooted difference in understanding will be be considered in Section B below, particularly in the discussion of capital management. Our present concern is to specify an institutional structure for the BPO that would facilitate the achievement of its formal objective under pragmatic market socialism of providing accurate and effective performance evaluation of corporation executives. The proposal sketched out herein is of course merely tentative and provisional.

It is essential to recognize that the role of the Bureau of Public

Ownership in the pragmatic market socialist economy is most definitely *not* that of either a central planning authority or a regulatory agency. Therefore, the BPO would be strictly forbidden from issuing any instructions, advice, or guidelines whatsoever to corporation executives regarding the microeconomic decision variables of business enterprise. These microeconomic decision variables include, among others, production levels, prices, marketing expenditures, hiring and firing of employees, borrowing, profit retention (retained earnings), and capital investment projects. The BPO's duties would be strictly confined to performance evaluation of the highest executives of the publicly owned corporations. Remuneration and retention of corporation executives would be at the discretion of the BPO. Plans of remuneration utilized for the executives of each corporation would be drawn up by the executives themselves, but they may be vetoed by BPO personnel. Even more important than this power would be the power of dismissal. This power would probably be confined to the highest executive of each corporation: its president. Should the long-term profit performance of a given publicly owned corporation be inadequate, its president could be dismissed by the BPO.

One of the departments within the central office of the Bureau of Public Ownership would be charged with the econometric estimation of profit rate functions, based on statistical data provided by the publicly owned firms. On the basis of such functions, two critical profit rates could be numerically determined for each firm. The higher of these would represent a profit rate such that if the firm were achieving that rate or higher, its chief executive *could not be* dismissed by the BPO under any circumstances. The lower of the two critical rates would represent a profit rate such that if a particular corporation were achieving that rate or lower, its chief executive *must be* dismissed by the BPO without further question. Such a rate might be two standard deviations below the expected rate, implying a statistically significant shortfall in the profit rate.

In addition to the central office of the BPO, there would be a network of numerous local offices staffed by ten to fifteen BPO agents each. The principal role of the BPO agent would be to make the decision regarding retention versus dismissal for corporation chief executives whose corporations' profit rates fall into the gray area between the two critical profit rates described above. A typical BPO agent would be assigned several publicly owned corporations, and his or her sole source of income would be a small percentage of the property return paid over by these corporations to the BPO. In contrast to long-term clerical, professional, and administrative BPO personnel, the agents would be short-term employees with long prior experience as middle to upper level business executives. A roster of business executives would be maintained, and potential new BPO agents would be selected at random from it. Those selected would be given the opportunity of serving five to seven year terms as BPO agents. The average achieved rate of remuneration for BPO agents would be sufficiently generous to make this an attractive opportunity for most of those tapped. Thus the key decision on retention versus dismissal of corporation executives whose profit performance has been sub-par would be made by quasi-autonomous individuals with long prior experience as business enterprise managers-individuals who are presumably both knowledgeable about business management and sympathetic to business managers.

Another purpose served by the delegation and dispersion of BPO authority through a system of local offices staffed by quasiautonomous agents is that of ensuring a competitive profit-seeking motivation in the business enterprise sector-despite the common public ownership of the majority of large corporations.⁹ The BPO agents in any one local office would be forbidden from having any contact with agents in other local offices during their tenure as BPO agents. Also, the corporate responsibilities of the agents in any one local office would be in relatively unrelated industries. These arrangements would be designed to support the strict prohibition of any effort by BPO personnel to organize or encourage collusive behavior among competitive corporations. Such efforts would constitute violations of existing antitrust laws, and it is envisioned that these laws would be strictly enforced on both the BPO's central office and its agents. The intention of pragmatic market socialism is to maintain at least as much competition in the business sector as currently exists under capitalism. Thus the key power of discretionary dismissal of corporation executives would not reside in the central office of the BPO, but would reside with the highly dispersed agents. Moreover,

a reasonable amount of monitoring of the activity of individual agents would be undertaken to discourage temptations toward the encouragement of collusion.

The Investment Mechanism. Economic history seems to have falsified Karl Marx's prediction of steadily worsening business depressions—up to the point of social revolution. Nevertheless, business fluctuations continue to occur, and although they are not catastrophic they are certainly very disruptive and demoralizing. The fact that a cycle problem persists under contemporary capitalism suggests the possibility of a significant conflict of interest between the capital owning minority and the rest of the population. Business executives are cautious about capital investment, and liable to the waves of pessimism which generate recessions, because of the strong concern for profitability enforced on them by the capital owners. It is usually assumed that this potential conflict of interest is rendered harmless to the extent that implementation of Keynesian stabilization policy eliminates or greatly moderates business recessions. This assumption is quite possibly unwarranted.

Implementation of standard Keynesian stabilization policy suggests a long-term retardation in the rate of growth of business physical capital. During the expansion phase, the accumulation of savings is reduced through redistribution. During the contraction phase, the decline in business capital investment is counteracted by an increase in discretionary public spending and an increase in private consumption, the latter to be inspired (most likely) by reduction of personal taxes. The purpose of the policy is to keep the rate of accumulation of business capital in the long term sufficiently low to maintain indefinitely a rate of profitability regarded as "adequate" by the capital owners. It could be, therefore, that in a society in which the capital owners did not constitute a distinct subset of the population with interests significantly different from those of the rest of the population, a higher long-term rate of business capital accumulation might be deemed socially desirable than the rate currently maintained under capitalism.

To the extent that sub-optimal business capital accumulation exists under capitalism, however, the same problem would exist under pragmatic market socialism—as so far described. The Bureau of Public Ownership would enforce upon the corporation executives the same strong concern for profitability presently enforced upon them by the class of capital owners. To counteract the potential adverse effect on business physical capital investment of the concern for the maintenance of high profitability among executives of established business corporations, it would be necessary to undertake additional institutional alterations along the following lines.

First, it is proposed that a new category of national government expenditure be created: business capital investment. The annual appropriation for this line item would go through the usual budgetary process. Second, it is proposed that two new national government agencies be established—independent of the BPO—for the disposition of this budgetary appropriation into the business sector: (1) the National Investment Banking System (NIBS); (2) the National Entrepreneurial Investment Board (NEIB). These two agencies are intended to supplement-not to replace-investment activity carried on by publicly owned firms under BPO authority, and by privately owned firms in the category of small business and/or entrepreneurial business. Publicly owned firms include nonfinancial corporations which "lend" investment funds to themselves via retained earnings. as well as financial intermediary corporations such as banks, insurance companies, pension funds, and so on, which lend investment funds to, and purchase securities from, other business corporations.

The NIBS and the NEIB are differentiated from the standard publicly owned investment channels by the fact that while the performance evaluation of executives of firms in the standard channels would be implicitly oriented to the rate of property return produced on the *entire* accumulated stock of business capital, the performance evaluation of NIBS loan officers and NEIB agents would be explicitly oriented toward *recent* business capital investment. NIBS loan officers would be evaluated not on the basis of the success of all past loans they have made, but only on the basis of the success of their recent loans—for example, those made within the last two to three years. The purpose of the NEIB is declared by its name: to establish entrepreneurial firms. Of course, an entrepreneurial firm has no interest in the rate of return achieved on the physical capital accumulations of existing firms. Therefore, evaluating the success of an agency in terms of the rate of property return produced by entrepreneurial firms effectively means performance evaluation in terms of recent capital investment. In addition to direct funding from the national government budget, the NIBS and the NEIB would also rechannel all property return received on their loans and investments into business physical capital investment. In addition to its direct appropriations and retained earnings, the NEIB could solicit funding for entrepreneurial firms from ordinary financial intermediaries under BPO authority.

Through a direct government appropriation into business physical capital investment, and through these new agencies (the NIBS and the NEIB), it is quite possible that pragmatic market socialism would in fact maintain a significantly *higher* long-term rate of business capital accumulation and economic growth than does contemporary capitalism.¹⁰ However, it should be emphasized that no additional suggestions are made that pragmatic market socialism would be more stable and resistant to business recessions than capitalism. The NIBS-NEIB proposal, as stated, would not in itself address the stabilization issue. A higher long-term rate of business capital accumulation may or may not adversely affect the rate of property return in business enterprise (thus tending to lower the amount of capital property return available for social dividend distribution), but even if it does, this decline would presumably be outweighed by the higher rate of growth in real national income.

B. Pros and Cons

While a proponent of pragmatic market socialism is obliged to argue that the reason why this economic system does not yet exist anywhere in the real world is simply that humanity has not yet become sufficiently aware of the possibility, an opponent is able to point to the seeming unlikelihood of inadequate awareness (particularly as the pragmatic market socialist proposal is not particularly complicated)—which in turn implies that the proposal has been, and continues to be, rejected by humanity on the basis of its inherent defects. Clearly, a great many objections to the proposal may be discerned. We will be concerned in this section with that relatively small subset of economic objections directly applicable to the pragmatic market socialist proposal as outlined above. In this category are three principal arguments: First, the pragmatic market socialist economy may be unable to sustain an adequate amount of capital management effort in its various forms (corporate supervision, investment analysis, entrepreneurship, and so on). Second, the pragmatic market socialist economy may be unable to sustain an adequate amount of saving (either private saving and/or total saving). Third, there may be no significant benefit to be achieved through equalizing the distribution of capital property return via pragmatic market socialism, because this return may already be distributed in a sufficiently equal—or at least in a sufficiently fair—manner under contemporary capitalism. This third argument is based on perceptions associated with the well-known term "people's capitalism."

Two other general categories of potential objections to pragmatic market socialism will *not* be considered here, as they would take us too far afield from the the technical economic focus of this particular study. The first of these is the political argument against all forms of public ownership socialism, according to which public ownership of the preponderance of capital stock by the state results in a combination and concentration of economic and political power in the hands of high government officials, with the consequent likelihood that this power would be utilized to suppress genuinely democratic institutions and processes and to guarantee the indefinitely continued power of the incumbent political leaders. This, of course, is a very serious charge against socialism, and the author has considered it carefully elsewhere.¹¹

The second general category of objections to pragmatic market socialism which will not be considered here are those which attribute to pragmatic market socialism the real or supposed defects of realworld socialist systems, such as the communistic socialist system which flourished in the Soviet Union until recently, and the social democratic socialist system which is supposed to have flourished, for example, in the Scandinavian nations. Pragmatic market socialism, of course, is a plan for a socialist system which has been specifically designed to avoid the perceived defects of communistic socialism and social democratic socialism. It seeks to avoid the central planning system, the soft enterprise budget constraint, and other aspects of communistic socialism which have constrained the economic performance of that system. Similarly, it does not incorporate the steeply progressive income tax rates and generous welfare benefits associated with social democratic socialism (in this case, however, the stance of the pragmatic market socialist proposal is neutral rather than directly opposed). There are many, of course, who would be inclined to argue that the observed defects of actual real-world socialist systems are inherent and inevitable, so that any proposal for a socialist system free of these defects is necessarily unviable and utopian. The only response made here to this argument is that it displays insufficient awareness of the evolutionary character of social systems which has been demonstrated by the history of human civilization, and that in reality the argument is little more than an effort to beg the question.

We turn now to the objection to pragmatic market socialism which, in the judgment of the author, is by far the most plausible and serious of all the relevant economic objections. This is the possibility that capital management effort under pragmatic market socialism would be substantially below capital management effort under capitalism, and that consequently the productivity of capital under pragmatic market socialism would be very seriously inferior to that under capitalism. Much of the following pertains to this objection: the later discussions of the saving and people's capitalism objections to pragmatic market socialism will be somewhat briefer.

Return to Capital Management. The pragmatic market socialist proposal outlined above manifests the judgment that at least 95 percent of property return under contemporary capitalism, that minimum percentage which the Bureau of Public Ownership would be required to distribute to the general public as social dividend income under pragmatic market socialism, represents unearned income to which the current recipients have no economic or ethical right. This property income is perceived to be rental income in the Ricardian sense, or alternatively, as producers' surplus: as an excess of income received over the disutility incurred by its present recipients in its production. On the other hand, the proposal for an activist BPO charged with explicit responsibility for enforcing profit motivation in the business sector through performance evaluation of corporation executives—this agency to finance itself with a small, statutorily limited percentage of property return—indicates that this small percentage of property income is considered to be rightfully earned by its recipients through their active enforcement of profit maximization. The question is whether or not a BPO which retains only, say, 5 percent of property return can do as good a job of capital management as does a class of capital owner-managers under capitalism which retains 100 percent of property return.¹²

Table 2.1 summarizes a simple partial equilibrium model of the representative capital manager which may be used to analyze this question. The model is a straightforward application of the standard static labor-leisure decision model of neoclassical economic theory.¹³ The capital manager maximizes utility, which depends positively on income y and negatively on effort e, subject to the budget constraint $y = f + \alpha \beta r(e)k$. Equations (1)-(6) determine the six endogenous variables of the model. Expressions governing the signs of the comparative statics derivatives of e with respect to the four exogenous variables are given in the lower part of the table. The first of these expressions shows the pure income effect. The pure income effect is the one unambiguous result obtainable on the basis of the standard assumptions pertaining to the r(e) and U(y,e) functions: an increase in unearned income f will decrease capital management effort e. All three of the other parameters $(k, \alpha \text{ and } \beta)$ have ambiguous effects on e: the negative income effects (the first terms located under the pure income effect) conflict with the positive substitution effects (the second terms to the right of the first terms). Much of the debate concerning the practicality of the pragmatic market socialist proposal may be interpreted in terms of this simple model.

The capital management argument against pragmatic market socialism relies upon the presumption of an upward-sloping supply curve of capital management effort with respect to the effective wage of capital management effort. The effective wage of capital management effort in this model is $dy/de = \alpha\beta r'k$, a positive number. The factor $\alpha\beta r'k$ is a positive function of the retention coefficient α . Under capitalism, the retention coefficient is unity. Under pragmatic market socialism, it would be much lower: 0.05 is the benchmark figure.

TABLE 2.1

A Partial Equilibrium Model of the Representative Capital Manager

Variables

Exogenous (parameters): Endogenous: capital management effort f exogenous income е rate of return on capital capital responsibility k r α retention coefficient total return on capital R ß effectiveness coefficient R' retained return income of capital manager y utility of capital manager U Equations **Description/Properties** capital return production function with (1) $r = \beta r(e)$ $r'(e) = dr/de > 0, r''(e) = d^2 r/de^2 < 0$ definition (2) R = rk(3) $R' = \alpha R$ definition $(4) \quad y = f + R'$ definition $(5) \quad U = U(y,e)$ utility function with $U_{y} = \partial U/\partial y > 0, \ U_{yy} = \partial^{2} U/\partial y^{2} < 0$ $U_e = \partial U/\partial e < 0, \ U_{ee} = \partial^2 U/\partial e^2 < 0$ $U_{ye} = \partial^2 U/\partial y \partial e = U_{ey} = \partial^2 U/\partial e \partial y < 0$ first-order utility max condition (6) $U_{\gamma}\alpha\beta r'(e)k + U_e = 0$

Comparative Statics Analysis:

θ	$\partial^2 U/\partial e \partial \theta$	Sign
f	$(U_{yy}\alpha\beta r'(e)k - U_{ey})$	_
k	$\alpha\beta r(e)(U_{yy}\alpha\beta r'(e)k - U_{ey}) + U_y\alpha\beta r'(e)$?
α	$\beta r(e)k(U_{yy}\alpha\beta r'(e)k - U_{ey}) + U_{y}\beta r'(e)k$?
β	$\alpha r(e)k(U_{yy}\alpha\beta r'(e)k - U_{ey}) + U_y\alpha r'(e)k$?
	(-) (+)	

Given an upward-sloping supply curve of capital management effort, this substantial decrease in the retention coefficient would decrease capital management effort, possibly by a substantial amount. A substantial decrease in capital management effort would in turn produce a substantial decrease in the rate of return on managed capital, and a substantial decrease in property return. This decreased property return would be a tangible manifestation of a decrease in overall economic efficiency.

There are several rebuttals to this argument to be made by an advocate of pragmatic market socialism. These rebuttals pertain to the four exogenous variables which determine capital management effort *e*. We will consider these four exogenous variables in the following order: (1) the retention coefficient (α); (2) unearned income (*f*); (3) managed capital (*k*); (4) the effectiveness coefficient (β).

(1) The Retention Coefficient. It is a presumption of the critic of pragmatic market socialism that the supply curve of capital management effort for the representative capital manager has a substantial positive supply elasticity with respect to the effective wage, i.e., that the substitution effect heavily outweighs the income effect. But in the view of proponents of the proposal, capital management effort under modern capitalism, consisting as it does of mere performance evaluation of corporation executives in terms of the profitability of their corporations, is an inherently undemanding task. The real human effort is involved in the ordinary labor of corporation employees and corporation executives which produces the profits, and in the ordinary labor of accountants, statisticians, and economists which measures, reports, and analyzes the profits. Once all this work has been done, it is an easy matter to fire the presidents of badly performing corporations. This suggests the notion of the plateau production function: a relatively small amount of capital management effort e, involving negligible disutility, suffices to bring the rate of property return to very near its asymptotic upper limit.¹⁴ If the production function is of the plateau form, the utility maximizing equilibrium of the capital manager will tend to be characterized by a very low r', and as r' appears in both the substitution and income effect terms, this implies weak comparative statics effects of all

exogenous variables on capital management effort. This suggests the possibility that the amount of capital management effort currently being exerted by the capital owners under capitalism might be virtually nil. Thus it might not be necessary for a socialist economy to achieve very much capital management effort in order to match the efficiency of the capitalist economy.

(2) Unearned Income. As shown above, there is only one unambiguous comparative statics effect in the standard microeconomic model of household labor supply based on constrained utility maximization: the higher its unearned income f, the lower the labor provided by the household. It is a presumption of the apologist for capitalism that the property income received by the property owners under capitalism represents mostly or entirely an earned marginal product return to capital management effort. An alternative possibility entertained by advocates of socialism is that this income of the capital owners under capitalism represents mostly or entirely the marginal product return produced by the nonhuman factors of production capital and natural resources (K and N), and that only a very small part of it-if any at all-is legitimately attributed to the capital management effort of the capital owners. The substantial diminishment in the income of the representative capital manager effected by the low BPO retention coefficient under pragmatic market socialism might then actually represent a decline in unearned income f at least as much as a decline in the effective wage of capital management effort. While the effect of a decline in the effective wage on capital management effort is ambiguous, the effect of a decline in unearned income would definitely be to increase capital management effort. Thus even if the representative capital manager were operating on an upward-sloping capital management effort supply curve, the potential decline in effort brought about by a lower retention coefficient may be counteracted by the increasing effect on effort of a decline in unearned income.

(3) Managed Capital. Common sense suggests that even if the supply curve of labor is rising at a relatively low wage level, it will not rise indefinitely but will become backward-bending at a sufficiently high wage. Given that leisure is a superior good, it seems obvious that at a very high wage and income level, the income effect

would dominate the substitution effect. This suggests that the bowshaped supply curve of labor is more realistic than the monotonically rising supply curve of labor. In the capital management model, the effective wage of capital management effort is given by the factor $\alpha\beta r'k$. There is some critical k (call it k*) at which capital management effort *e* is maximized, for given values of α and β , and for given r(e) and U(v,e) functions. Under pragmatic market socialism, an effort could be made to adjust the scale of the BPO so that the managed capital per BPO employee is closer to this critical k^* level than it is for the capital owners under capitalism. As is well known, there is very wide dispersion in the amounts of capital wealth owned by individuals under capitalism. Much capital wealth is owned by plutocratic capitalists, whose personal k is so large, and hence the implied effective wage of capital management effort is so high, that they are probably well back in the backward-bending parts of their supply curves of capital management effort. On the other hand, much capital wealth is also owned by small-scale savers, whose capital wealth is so small that the effective wage of capital management effort is very low, and these individuals also, although they are located on the upward-sloping parts of their supply curves of capital management effort, are motivated to provide very little such effort. In contrast, the BPO employee under pragmatic market socialism. whose sole source of income would be from property return, would manage capital of an appropriate amount, taken in conjunction with the retention coefficient, to encourage capital management effort.

(4) The Effectiveness Coefficient. The effectiveness coefficient, designated by β in the Table 2.1 model, is a measure of the impact of capital management effort on the rate of return on managed capital. In a strict sense, this notion pertains to the r(e) function itself, but it is somewhat more convenient notationally to locate the parameter β as a linear coefficient in front of the r(e) function rather than to put it into the r(e) function. A rise in the effectiveness coefficient as between capitalism and socialism would tend to offset the potential diminishing effect on capital management effort of the decline in the retention coefficient. There are at least two reasons why such a rise in the effectiveness coefficient is not improbable. The first is the possibility of a larger supply of ordinary labor under pragmatic

market socialism than under capitalism. The conversion of a flow of mostly unearned capital property income into a flow of social dividend income, which amounts effectively to an across-the-board increase in the wage rate, could increase labor both from the elimination of what is likely an unearned return and from the higher wage (presuming an upward-sloping labor supply curve).

The second reason may be still more important. The concentration of the legal rights of capital ownership in the BPO under pragmatic market socialism might overcome the pernicious effects on the incentives to effort of corporation executives of the well-known separation of ownership and control phenomenon under capitalism.¹⁵ The institutional role of the BPO agent assigned to a particular corporation might be described as that of a one-person board of directors. In the capitalistic real world of today, most corporation presidents are hardly intimidated by the boards of directors to which they are formally subservient. Typically the board members are amateurish outsiders with little knowledge of the firm, they personally represent only a tiny fraction of the outstanding voting stock, and they are guided in their alleged deliberations by a chairman who is either the present president or a past president of the corporation. The monthly board meeting has become for the most part a ritualistic formality, and not the dire calling to account which it theoretically could be. There would be no need for ritualistic formalities under pragmatic market socialism, and no contact is envisioned between BPO agents and corporation presidents when the corporations' profitability is adequate. But if the profitability of a particular corporation sags to such a degree that its president becomes liable for dismissal, the corporation president would approach the ensuing interviews with the responsible BPO agent with the proper sense of awe and trepidation. In other words, the typical BPO agent under pragmatic market socialism would exercise much stronger disciplinary power over corporation presidents in his/her area of responsibility than is presently exercised by the vast majority of capital owners under capitalism. The greater likelihood of being dismissed for poor profit performance might well inspire a higher level of professional effort by top corporation executives. The improvement in the intensity of labor by top corporation executives would be manifested by a rise in the effective-
ness coefficient through which a given amount of capital management effort is translated into a rate of return on managed capital.¹⁶

It should be clear from the above discussion that the standard microeconomic theory of labor supply does not provide any compelling grounds for rejecting the proposition that pragmatic market socialism would achieve a level of economic efficiency at least equivalent to that of contemporary capitalism. The argument that a decline in the retention coefficient will reduce capital management effort via the reduction in the effective wage of capital management effort is merely a speculation—a speculation which may be countered by other speculations, of equal a priori plausibility, to the effect that the decline in the retention coefficient, when considered in the light of all other factors, is not likely to have a serious adverse impact on economic efficiency.

Return to Saving. There are two versions of the return to saving justification of property return in capitalist apologetics: the naive version and the sophisticated version. According to the naive version, the termination of property income paid to personally owned financial asset accumulations would very dramatically decrease the flow of private saving, this would entail a severe shortage of investment capital, and economic growth would thereby be reduced, terminated, or possibly even reversed. The most glaring fault in this argument is that it simply ignores an elementary solution to the problem: initiate a flow of social saving, directed toward business capital investment, to replace the lost private saving. The sophisticated version of the argument allows for the possibility of social saving, but alleges the inefficiency of social intervention in the determination of the aggregate saving rate. It is held that an efficient aggregate saving rate is that rate generated by fulfillment of the microeconomic efficient saving condition: that the disutility of saving to each private household exactly equals the marginal productivity of capital investment to each business enterprise. Both the naive and sophisticated versions of the return to saving argument depend on the proposition that private saving is a positive function of the rate of property return (or of the "rate of interest" in the customary phrase).

The first point to be made in rebuttal to this argument is therefore that at this point in time the proposition that there is an upward-sloping supply curve of private saving with respect to the rate of property return is nothing more than a speculation. The proposition is not supported by either casual empiricism, economic theory, or worthwhile statistical evidence. With respect to casual empiricism, the primary motivations for saving, as far as conscious awareness is concerned, include provision for old age, emergencies caused by illness or injury, children's education, the acquisition of expensive consumer goods, and so on. Surveys indicate that even very wealthy respondents list these as the primary reasons for saving, and not the accumulation of a source of property income. Apologists for capitalism developing the return to saving justification for property income make reference to the time preference of the individual, and to the risk-taking which saving entails, particularly when the savings are put into investment assets. But the sacrifice of present consumption in the act of saving is balanced by a gain in future consumption. And the risk of depreciating financial assets is balanced by the greater security in confronting an uncertain future enjoyed by an individual who possesses financial assets.¹⁷

Turning to economic theory, we note that the presumption of an upward-sloping supply curve of saving simply ignores the income effect of a change in the interest rate. Given that future consumption (or possibly future security) is a superior good, the income effect of a change in the rate of interest conflicts with the substitution effect, and it can only be an unsubstantiated assumption that the substitution effect dominates the income effect to make the supply curve of saving upward-sloping. This theoretical ambiguity is reflected in introspective ambiguity. Not many individuals can respond truthfully and confidently in the affirmative that if the rate of interest increases, they will increase their rate of saving. Of course, ambiguous comparative statics results from theoretical models utilizing no more than such axiomatic principles as diminishing marginal utility are the general rule. These ambiguities are supposed to be resolved by econometric investigations. Unfortunately, the various data, specification, and identification problems normally confronting econometric investigations are sufficiently formidable that the results of such investigations typically possess little force unless they are strongly supported by casual empiricism and common sense.

However, it is advisable that advocates of socialism concede that the prevailing uncertainty about the effect of the rate of interest on private saving does not add up to the proposition that the termination of interest payments to private savers under socialism would not substantially reduce private saving. It is certainly within the realm of possibility that the interest elasticity of private saving is indeed positive and numerically appreciable. If this turned out to be the case, social saving out of tax revenue would have to be undertaken to replace the private saving lost because of the abolition of interest payments on private savings. While the government would endeavor (implicitly rather than explicitly) to match up the marginal disutility to the representative taxpayer of paying taxes earmarked for business capital investment to the marginal productivity of capital investment to the representative business enterprise, it would doubtlessly be true that the marginal disutility of paying these taxes to each and every taxpayer would not be equal to the marginal productivity of capital investment to each and every business enterprise. But it is certainly very plausibly arguable that the failure to meet the microeconomic efficient saving condition under pragmatic market socialism would be unimportant in a practical sense. The argument relies on the dubiousness of the condition itself and the apparent absence of its fulfillment already under capitalism, together with the general consensus that regardless of this absence capitalism is maintaining an adequate (or workable) level of efficiency.

First, there is no good reason to suppose that the microeconomic efficient saving condition is a worthwhile approximation of a true efficiency condition, as the external effects of the private saving decision—which may well be significant—are ignored. Second, the condition clearly does not hold presently in the real world because of the effect of taxation, and yet the real-world economies of the advanced capitalist nations seem to be doing quite well. Finally, the condition simply ignores the equity consideration; it defies common sense to propose that society continue to put up with wealthy capitalists maintaining luxurious lifestyles by means of the disproportionate share of property income they receive on inherited capital fortunes, simply to support a dubious efficiency principle derived from a drastically simplified model of economic reality. The available evidence suggests strongly that over 90 percent of the population of a typical advanced capitalist nation would receive more social dividend income if property return were distributed as a social dividend supplement to earned labor income under pragmatic market socialism, than they currently receive under the present capitalist system in which property return is distributed to individuals in proportion to personally owned capital wealth (i.e., savings accumulations). The microeconomic efficient saving condition simply does not constitute a serious counterargument against this significant equity argument.¹⁸

People's Capitalism. The people's capitalism thesis in effect asserts the irrelevance of the traditional socialist complaint against capitalism that property income is unearned by its human recipients, the capital owners. This complaint is irrelevant, so the argument goes, because the distribution of capital wealth (and hence of the property income which capital wealth produces) is not all that unequal. The available hard statistical evidence on capital wealth distribution is neither abundant nor particularly reliable, but enough is known to make this argument appear exceedingly dubious-as far as the distribution of current capital wealth is concerned. But the apologist for capitalism, if forced to confront this evidence, merely asserts that the observed inequality in current capital wealth is much greater than the inequality in expected lifetime capital wealth. Since there is no worthwhile empirical evidence whatsoever on the distribution of expected lifetime capital wealth, this assertion cannot be directly refuted. However, at the least it may be said that a considerable amount of circumstantial evidence is available that casts grave doubt on the hypothesis that the distribution of expected lifetime capital wealth is substantially more equal than the distribution of current capital wealth.

It is obviously a matter of considerable political significance as to what percentage of the population would be better off under pragmatic market socialism than under capitalism. Of course, the answer to this question depends critically on the relative efficiency of pragmatic market socialism, which in turn depends critically on whether or not property income is earned or unearned in an economic sense. The reader must make a judgment on the efficiency question on the basis of the institutional features of the pragmatic market socialist economy proposed in Section A of the present chapter, together with the consideration of the return to capital management and return to saving justifications for property return contained in the preceding part of Section B. In order to say anything of a numerical nature on the equity question, a numerical assumption has to be made on the efficiency question. The assumption that will be made for this purpose is that the efficiency of the pragmatic market socialist economy would be the same as the efficiency of the contemporary capitalist economy, and this would be manifested by the same amount of property return generated by the business sector under the two systems. On the basis of this assumption, the percentage of the United States population potentially benefited by social dividend distribution of property return may be estimated. Presumably the percentages benefited of the populations of the other advanced capitalist nations would be roughly similar. If in practice pragmatic market socialism would be less efficient than capitalism, this percentage would be smaller by some amount. If in practice pragmatic market socialism would be more efficient than capitalism, this percentage would be larger by some amount.

The estimate itself (94.21 percent of the population) is based on data derived from the 1963 Federal Reserve Board survey on capital wealth ownership in the United States population, whose results were described in a report entitled Survey of Financial Characteristics of Consumers, authored by Dorothy S. Projector and Gertrude S. Weiss and published in August, 1966. The report issued on this ambitious survey remains to this day the richest single published source on capital wealth distribution in the United States. It may be shown that if the adjusted ratio of the labor income of a given household to mean labor income in the population ("adjusted" in the sense of taking account of the fact that the Bureau of Public Ownership would retain part of capital property return) is greater than the ratio of the capital wealth of that household to mean capital wealth in the population, then that household would receive more social dividend income under pragmatic market socialism than it receives capital property income under capitalism. Using the Projector-Weiss data, it may be determined that 94.21 percent of the U.S. population has a ratio of

labor income to mean labor income higher than the ratio of capital wealth to mean capital wealth under the assumption that the BPO retains 5 percent of capital property return.¹⁹

The Projector-Weiss data may also be used to respond to two important objections to this approach that might be raised by a skeptic. The first objection is that the estimate stated above is based on the distribution of capital wealth in the entire population—but a substantial amount of capital wealth inequality may be attributable to life cycle saving. The second objection is that the BPO retention coefficient may have to be considerably higher than 0.05 if efficiency is to be maintained. The 1966 Projector-Weiss FRB report gives the distribution of capital wealth not only for the entire population, but for four age brackets as well: age of head of household under 35, 35-54, 55-64, and 65 and over. Using this information, it is possible to estimate the percentage of the population within each of these four age brackets that would benefit from social dividend distribution of property return. Also, it is a simple matter to re-estimate the percentage benefited for different values of the BPO retention coefficient.

With respect to the retention coefficient, it has remarkably little impact on the percentage benefited within any feasible range (retention coefficients as high as 0.25 were used in the numerical experimentation). With respect to age, the data indicate some positive impact of life cycle saving on capital wealth inequality-but this impact is apparently very slight. As a result, even considering the wealthiest age bracket of the population (55-64), the age bracket which encompasses the usual age of retirement, the percentage of this age group which would be benefited by social dividend distribution is 85.52 percent for a BPO retention coefficient of 0.05, and it declines only to 82.23 for the substantially higher BPO retention coefficient of 0.25. In sum, neither a higher BPO retention coefficient (within reasonable limits) nor the life cycle saving factor materially affects the qualitative proposition that the overwhelming majority of the U.S. population would be financially benefited by pragmatic market socialism.

This leaves the apologist for capitalism one last line of defense on which to fall back. This line consists of the speculation that there is a great deal of age-independent capital wealth mobility in the population (poor today, rich tomorrow—and vice versa). Needless to emphasize, this proposition conflicts sharply with the impression that most people gain through casual empiricism: the impression that the poor tend to stay poor and the rich tend to stay rich. The proposition of age-independent capital wealth mobility is "empirically supported" by Andrew Carnegie-style rags-to-riches stories. But it is very doubtful that these atypical cases manifest a numerically important social phenomenon.

The available empirical data suggest a high and relatively constant level of capital wealth inequality. The high level of capital wealth inequality cannot be attributed to life cycle saving to any important extent, because if life cycle saving were an important factor in capital wealth inequality then capital wealth inequality would be significantly lower within each age bracket of the population than it is for the entire population—but available empirical data demonstrate that this is not the case. On the other hand, a hypothesis which *is* fully consistent with the available data is that the dominant factors in determining capital wealth inequality are the inequality of capital wealth inheritances, and random variation in the rates of appreciation of individual capital wealthholdings.

That inheritance is an extremely important factor in capital wealth inequality has been fully evident to social analysts on the basis of casual empiricism for a very long time. But owing to the efforts of scholars such as Colin Harbury in the U.K. and Paul Menchik in the U.S., there is now reasonably respectable formal statistical support, from research in probate court records, for the proposition that inheritance is a major factor in the perpetuation of capital wealth inequality. For example, in his 1980 article, Menchik reported results from linear regressions of an individual's estate at death on the real present value of inheritances received, based on four different methods for computing real present value (Table 4.2). For three of the four methods, the resultant R-squareds were all approximately .59, while for the fourth it was .36. It is not extravagant to say, on the basis of this evidence, that possibly as much as 60 percent of capital wealth at a person's death is statistically directly attributable to inheritances received.

But what of the remaining 40 percent? May this be attributed to

the personal merit and social contributions of the capital owners? Does it represent "self-made wealth," to use the customary term? It *may* be attributed to the personal merit and social contributions of the capital owners, but it may also—with perhaps greater realism—be attributed to random variation in rates of capital wealth appreciation which have nothing whatever to do with the personal merit and social contributions of the capital owners.

The implications of random growth on an unequal inherited asset base may be assessed using computer simulation.²⁰ The first point which emerges is that random variation, in and of itself, does not tend to break down capital wealth inequality. Downward mobility is just as likely as upward mobility, and the statistically expected position of any person in the capital wealth distribution at every point in time is exactly his or her initial position. This is fairly obvious, but what is perhaps not quite so obvious is that the expected inequality of the lifetime capital wealth distribution will therefore tend to be exactly that inequality that characterizes the *initial* capital wealth distribution. At the same time, random variation will produce a few dramatic cases of upward and downward wealth mobility (rags-to-riches and riches-to-rags), even though the overall wealth distribution remains stable. Monte Carlo experiments with random capital wealth appreciation models produce results similar to empirical results reported by probate court researchers such as Menchik. Thus it can be said that these empirical results are compatible with the hypothesis that any variation in terminal capital wealth not statistically attributable to initial (inherited) capital wealth is merely a function of random variation, and has nothing to do with the personal merit and social contributions of the capital owners.

It seems plausible that the distribution of personal merit and social contributions would in actual fact parallel the distribution of personal abilities such as intelligence. But it is well-known that the inequality of capital wealth ownership under contemporary capitalism dramatically exceeds both the inequality of personal ability and the inequality of labor income. It seems improbable, therefore, that the distribution of personal merit and social contributions is an important contributor to the extremely unequal distribution of capital wealth under contemporary capitalism. The far more plausible hypothesis attributes this extreme inequality almost entirely to the workings of inheritance and chance.

Contribution of the General Equilibrium Research. This completes a short review of the pros and cons regarding the pragmatic market socialist proposal. Actually, since the discussion has been solely in terms of the enumeration and attempted rebuttal of a series of objections to pragmatic market socialism, it might be more accurately labeled an analysis of the "cons" without any countervailing development of the "pros." Be that as it may, at this point the relevance of the substantive general equilibrium research reported below in Chapters 3 and 4 to the questions raised in the foregoing will be briefly sketched.

The model described, implemented, and solved in the following casts direct illumination on all three of the objections to pragmatic market socialism discussed in the foregoing: the possibility of inadequate capital management effort and the possibility of inadequate saving (both of which affect the efficiency of the system), as well as the "people's capitalism" possibility that the distribution of capital property income under contemporary capitalism is already sufficiently equal that the implementation of pragmatic market socialism would not achieve a significant equity benefit.

Within the model, the individual household provides three primary factors of production: labor, saving, and capital management effort. The first two factors, labor and saving, are of course jointly incorporated into a great many partial equilibrium and general equilibrium models for the analysis and evaluation of policies and institutions. But the present model is so far unique in adding to labor and saving the additional primary factor of capital management effort. Capital management effort refers to any and all types of human exertion which are intended to increase the rate of return on capital and which are not accounted for in the ordinary labor of the household. This includes primarily two components: corporate supervision, and investment analysis. Corporate supervision is not to be confused with corporate management, which is provided by salaried executives. "Entrepreneurship" is often cited in capitalism's apologetic literature, and this also might be deemed a form of capital managementalthough it is probably more accurate to consider it a combination of investment analysis to begin with (in deciding on what type of firm to establish), followed by corporate supervision (in overseeing the firm once it has been established).

This key innovation of the model is found to be central to the performance of pragmatic market socialism relative to capitalism. The model's output elasticity of capital management effort parameter (that is, the elasticity of aggregate output with respect to capital management effort—or the output elasticity of capital management effort) reflects the degree to which capital property income may be legitimately regarded as an earned return to capital management effort: if the numerical value of this parameter is very small, then capital property income is mostly unearned, but if it is larger, then capital property income is mostly earned. The model solutions show pragmatic market socialism to be superior to capitalism if the elasticity of capital management effort is small, but inferior to capitalism if this elasticity is larger.

If the (output) elasticity of capital management effort is small, this means that the function relating capital management effort to the rate of return on capital (the r(e) function of Table 2.1 above) takes on the "plateau" configuration in which the maximum rate of return on capital is achieved with an extremely small input of capital management effort—the disutility of which would also be extremely small. The analysis based on Table 2.1 emphasized that under the plateau type of rate of return function, the actual amount of capital management effort provided under either capitalism or pragmatic market socialism would be very small—but that nevertheless the rate of return on capital would be near its asymptotic upper limit in both cases. In this respect, the general equilibrium results to be described below fully support the partial equilibrium analysis presented above.

Other points made above are illustrated by the general equilibrium results. For example, it was mentioned that the effectiveness coefficient under pragmatic market socialism (β) might be higher owing to higher labor because of social dividend distribution of capital property return in proportion to the earned labor income of the household (this amounting to an across-the-board increase in the effective wage). This possibility is indicated to be very important by the general equilibrium results. In fact, this particular indication suggests

the likelihood of an efficiency advantage of pragmatic market socialism (higher output through higher labor) which would supplement its equity advantage (in terms of the model, lower inequality of consumption).

The story on saving is somewhat more complicated. In a "preliminary" benchmark solution reported below in Chapter 4, Section A, the possibility is shown of higher private household saving under pragmatic market socialism than under capitalism. However, in the "principal" benchmark solution, private household saving under pragmatic market socialism is in fact lower than under capitalism. However, the shortfall is replaced by public saving, and the overall performance of the pragmatic market socialist economy, in terms of all three principal indicators utilized (aggregate output, consumption equality, and social welfare in the Benthamite social welfare sense), continues to be superior to that of the equivalent capitalist economy.

Thus the general equilibrium results suggest that unless the elasticity of capital management effort is relatively high, the return to capital management defense of capitalism is invalid. They also suggest that if the pragmatic market socialist economy simply counteracts a possible decline in private household saving with an increase in social saving, then the return to saving defense of capitalism is also invalid. Finally, with respect to people's capitalism, sensitivity analysis on downward variation in the inequality of the financial asset distribution, reported in Chapter 4, Section B, indicates that unless the distribution of capital wealth under contemporary capitalism is drastically more equal than seems to be indicated by the available evidence, then this particular defense of capitalism is also invalid. Even with considerably more equal distributions of capital wealth than that used for the benchmark solutions, the pragmatic market socialist economy shows significantly better performance than the equivalent capitalist economy on all three indicators.

On the whole, the results to be described below suggest that there is only one significant possibility under which capitalism would in fact be economically superior to pragmatic market socialism: if the output elasticity of capital management effort is relatively high, so that capital property income may be legitimately interpreted as an earned return to capital management effort.

A General Equilibrium Model

A. Theoretical Specification

The appendix to this chapter (pages 75-78 below) contains a comprehensive presentation of two variants of a general equilibrium model based on the same fundamental utility and production func-tions (respectively equations 8 and 12).²¹ In the narrative account of the model contained within the body of the chapter, equations will not be sequentially numbered, but will rather be designated by their numbers within the chapter appendix. Equations for the capitalist variant are preceded by a "C"; corresponding equations for the pragmatic market socialist variant are preceded by an "S." The basic general equilibrium model contains n skill levels of households, subscripted with an *i*, which in the empirical implementation are identified with ten income deciles of the United States population. Within each decile, all households are taken to be identical. Thus we may ordinarily envision each decile of the population as consisting of a single representative household. The wealthiest (highest productivity) decile is labeled "1," while the poorest (lowest productivity) decile is labeled "10."

There are three primary factors of production in the model: ordinary labor (l_i , defined as that human labor which earns ordinary wage and salary income), capital (K, a physical stock), and capital management effort (e_i , defined as human labor which enhances the productivity of the stock of physical capital but which is not recognized in ordinary wage and salary income). Of the three primary factors, two (ordinary labor and capital management effort) are provided directly by the household sector, while capital is provided indirectly through saving (s_i) according to the capital accumulation equation 16. In the capitalist variant of the model, these three factors produce national output Q through the following variant of the standard Cobb-Douglas production function:

$$Q = AK^{\varepsilon} \left[\sum_{i=1}^{n} e_i \right]^{\gamma} \prod_{i=1}^{n} l_i^{\delta_i}$$
(C.12)

where A, ε , γ , and δ_i are parameters of the function with A positive, and ε , γ , and δ_i all positive numbers less than unity, which incorporates the standard positive, diminishing marginal product assumption. The output elasticity of physical capital K is ε , the output elasticity of each decile's labor is δ_i , and the output elasticity of capital management effort, considered as the sum of the capital management efforts of all deciles, is γ . The production function is assumed to be linear homogeneous so that $\varepsilon + \gamma + \Sigma \delta_i = 1$.

This production function is described as a "variant" rather than as an "extension" of the standard Cobb-Douglas production function because of the way in which it adds the new element of capital management effort. A straightforward "extension" of the Cobb-Douglas form would be as follows:

$$Q = AK^{\varepsilon} \prod_{i=1}^{n} l_i \, {}^{\delta_i} e_i {}^{\gamma_i}$$

Such a form would be impractical here for two reasons. First, in contrast to the δ_i coefficients which may be empirically estimated by taking the observed labor income of an income decile as a proportion of the total income, there is no empirical means of estimating the γ_i coefficients since the two components of capital property income (return to physical capital K and return to capital management effort e_i) are not separated in the empirical data. Second, if the capital management effort e_i in any decile were zero, then output Q would also be zero owing to the multiplicative form of the function. But it is necessary to allow for zero e_i in some deciles because measured capital wealth in the lowest income deciles of the empirical data source is in fact zero, and zero capital wealth in a household implies zero capital management effort. Furthermore, the method used to specify hypothetical capital wealth distributions under capitalism

produces zero wealth in the lowest deciles for high levels of inequality comparable to the current level.

The proposed variant of the Cobb-Douglas function specifies a single γ parameter, referred to herein simply as "the" elasticity of capital management effort, which applies to the sum of capital management effort over all households. The value of γ is still a matter of conjecture, but at least the conjecture is confined to a single parameter rather than applying to ten such parameters for the ten deciles. And of course the proposed variant permits solutions of the model even though $e_i = 0$ for some low deciles, which is essential to the realism of the model as applied to the contemporary real-world capitalist economy.

The impracticality of a straightforward extension of the Cobb-Douglas production function also holds in the case of the pragmatic market socialist economy. The production function of the socialist variant of the general equilibrium model is given by:

$$Q = AK^{\epsilon}(\mu e)^{\gamma}[(1-\mu)l_1]^{\delta 1} \prod_{i=2}^n l_i^{\delta_i}$$
(S.12)

where μ is the proportion of first-decile households employed by the Bureau of Public Ownership, and $(1-\mu)$ is the proportion of firstdecile households engaged in ordinary labor. For reasons discussed below, it will be assumed that BPO employees in the pragmatic market socialist economy are drawn exclusively from the highest decile in terms of labor productivity. Thus the capital management effort from all deciles below the first would be zero ($e_i = 0, i = 2,...,10$). Thus if a straightforward extension of the Cobb-Douglas production function were utilized, output would necessarily be zero owing to the multiplicative form of the function. Just as is the case with the capitalist variant, it is necessary in the socialist variant to have a production function which allows for zero capital management effort from some deciles. (For purposes of envisioning the socialist variant of the economy, we must depart from the notion of a decile consisting of a single representative household-at least for the first decile. For the first decile, part of the total number of households are employed by the BPO, while the remainder engage in ordinary labor.)

Although the model's inability to allow for different output elas-

ticities of capital management effort for different deciles of the population must obviously be considered a shortcoming, this particular shortcoming should not be exaggerated. From the sensitivity results described in the following chapter, it appears that the critical issue in evaluating the potential performance of pragmatic market socialism relative to capitalism is the aggregate output elasticity of capital management effort. Given this value, it is almost certainly a relatively inconsequential issue how this aggregate elasticity is distributed over the deciles. For one thing, owing to the concentration of capital wealth under capitalism in the highest deciles of the population, most capital management effort is in fact concentrated in the highest deciles. Therefore it would seem that little error could be injected into the results from not using substantially lower capital management effort elasticities for the middle-to-lower wealth/income deciles.

While the model as specified does not permit examination of the effects of differing productivities of capital management effort over households, it does allow examination of the effects of differing numerical values of "the" output elasticity of capital management effort defined by the model (γ) . Therefore it does enable a technical interpretation of an ideological controversy over the potential performance of a pragmatic market socialist system relative to the contemporary capitalist system. It is commonsensically appealing that the potential performance of a pragmatic market socialist economy, relative to capitalism, would depend on to what extent property income under capitalism represents earned income. Those whose preconceptions favor capitalism may argue that property income is an earned return to capital management effort (among other things), while those whose preconceptions favor pragmatic market socialism may argue that property income is an unearned return deriving from the productivity of nonhuman factors of production and having little or nothing to do with the efforts of their legal owners under the capitalist system. If we represent aggregate capital management effort by the symbol E and arbitrarily set the multiplicative term involving ordinary labor equal to 1, we may represent the production function (equation 12) as $Q = AK^{\varepsilon}E^{\gamma}$, a form which clarifies the distinction between physical capital K and capital management effort Ε.

The output elasticity of physical capital K is ε , while the output elasticity of capital management effort E, a qualitatively different concept, is γ . As mentioned above, the production function is linear homogeneous, so that $1 - \Sigma \delta_i = \varepsilon + \gamma$. The model also incorporates marginal product pricing of household labor (equations 1 and 2). Observed aggregate property return is therefore in an accounting sense a residual obtained by subtracting aggregate labor income from total output. A pro-socialist viewpoint would interpret this pool of property income as deriving principally from the productivity of nonhuman capital and natural resources; while a pro-capitalist viewpoint might interpret it as deriving principally from the capital management efforts of human capital owners. The pro-socialist viewpoint may be translated into the hypothesis that the productivity of capital management effort is very small relative to the productivity of capital (γ is small relative to ε); while the pro-capitalist viewpoint may be translated into the hypothesis that the productivity of capital management effort is very large relative to the productivity of capital (γ is large relative to ε). As we find below in Chapter 4, this parameter does indeed influence the relative performance of the two systems in the expected direction.

An "extreme" pro-socialist viewpoint would hold that the output elasticity of capital management effort (γ) is zero, and that all property return derives solely from the productivity of physical capital. This extreme assumption is not incorporated into the model examined herein. Indeed, it is technically impermissible to assume that $\gamma = 0$ within this model, because if that were the case, every capitalist economy household would have zero capital management effort (see equation C.9), and then output would be zero. At the opposite end of the spectrum, the extreme pro-capitalist viewpoint would be that the output elasticity of physical capital (ε) is zero, and that all property income derives solely from the productivity of capital management effort. It would be technically permissible to set $\varepsilon = 0$ and $\gamma = 1 - \Sigma \delta_i$, since numerical solutions would be defined in this case. The question is whether it would be realistic to do so.

The preference structure of the household sector is indicated by the following straightforward extension of the standard Cobb-Douglas

utility function to include "effective assets":

$$u_i = c_i^{\phi_1} h_i^{\phi_2} (a_i^e)^{\phi_3} \tag{C.8, S.8}$$

where c_i is consumption, h_i is leisure, and a_i^e is effective assets. The utility function parameters φ_1 , φ_2 , and φ_3 are assumed to be positive numbers less than unity, which incorporates the standard presumption of positive, diminishing marginal utility of goods. As with the production function, the utility function is assumed to be linear homogeneous, so that $\varphi_1 + \varphi_2 + \varphi_3 = 1$.

This general function applies to all households under capitalism, as well as to all households under pragmatic market socialism, whether they be non-BPO households or BPO households (i.e., households not employed by the BPO, and households employed by the BPO). Note, however, that the specific forms of the utility function shown below in the chapter appendix vary depending upon the substitutions utilized. Respectively for all households under capitalism, non-BPO households under socialism, and BPO households under socialism, the utility functions are displayed in the appendix as follows:

$$u_i = c_i^{\varphi_1} \left(1 - l_i - e_i \right)^{\varphi_2} \left(s_i + (1 - \chi) a_i^{\rho} \right)^{\varphi_3} \tag{C.8}$$

$$u_i = c_i^{\varphi_1} (1 - l_i)^{\varphi_2} (s_i + (1 - \chi) a_i^{\varrho})^{\varphi_3}$$
(S.8)

$$u = c^{\varphi_1} (1 - e)^{\varphi_2} (s + (1 - \chi)a^o)^{\varphi_3}$$
(S.8')

For example, the capitalist variant of the model replaces leisure h_i with its definition in terms of the household decision variables labor l_i and capital management effort e_i , and also replaces effective assets a_i^e with its definition in terms of the household decision variable saving s_i . As another example, since under socialism non-BPO households provide only labor but no capital management effort, while BPO households provide only capital management effort and no labor, the respective definitions of leisure are appropriately adjusted. There will be other instances in the following of variances as between the form of a certain function displayed in the text and the form displayed in the chapter appendix.

Consumption and leisure are the standard arguments of the Cobb-

Douglas utility function and hence require no discussion. Effective assets is unconventional, and hence requires discussion. The effective assets concept is motivated by the need to incorporate into the model a simple and yet reasonably realistic theory of saving. Effective assets are defined as follows:

 $a_i^e = s_i + (1 - \chi)a_i^o$

This equation is based on two subsidiary equations: (1) $a_i = a_i^{o} + s_i$, which defines end-of-period assets a_i as beginning-ofperiod assets plus saving; (2) $a_i^{e} = a_i - \chi a_i^{o}$, which defines effective assets as end-of-period assets less the proportion χ of beginning-ofperiod assets. The use of a construct based on financial assets as a good in the utility function is not entirely conventional, but it is certainly intuitively appealing because financial assets enhance the household's overall psychological security, the benefits of which are comparable to those of commodity consumption (as in the expression that having, for example, secure employment is like "having money in the bank"). Aside from the intuitive plausibility of utilizing assets as a good in the utility function, it has a reasonable amount of precedent in the form of the "money in the utility function" literature and the increasingly common "bequest motive" in the literature on life-cycle saving.²²

According to the formulation, it is "effective assets," rather than simple end-of-period assets, which helps to determine the household's utility. Inclusion of the parameter χ incorporates a tendency toward asset retention by the household: the "effective assets" which determine utility are defined as the excess of end-of-period assets over some specified proportion of beginning-of-period assets. In actual fact, in the numerical analysis described below, this parameter is set equal to 1.01, which implies that households of all deciles "expect" a low rate of growth in financial assets (1 percent being low growth), and any utility derived from assets only pertains to assets beyond the amount implied by low growth.

Any suspicions that this feature of the model builds in a strong propensity toward saving in the economy are certainly justified. However, it must be immediately emphasized that without this feature, for any reasonable parameter values, the capitalist variant of the model displays either a counter-factual solution or no solution at all. Under real-world capitalism, financial asset ownership is highly concentrated in the upper deciles. If the "asset retention" feature implied by a high value of χ is *not* utilized, then parameter values which produce reasonable values of labor (l_i) and saving (s_i) for the lower deciles produce negative values for these same variables in the upper deciles. The analytics of the model can tolerate negative saving for some deciles, but the solution breaks down entirely if the labor output of even one decile—the highest—is negative. The fact that in the real world, the highest decile displays both positive saving and positive labor despite its very high financial wealth, strongly implies that there is in fact an asset retention mechanism at work which inhibits dissaving and the avoidance of labor. Thus this feature of the model is fully realistic given certain undeniable empirical realities.²³

Now that the basic building blocks which are common to both capitalist and pragmatic market socialist variants of the general equilibrium model have been introduced, namely the production function and the household utility function, it will hereafter be more convenient to deal with the two variants sequentially. Therefore we will complete the description of the capitalist variant, and then proceed on to the pragmatic market socialist variant.

In the capitalist variant of the model, the basic household decision variables include capital management effort e_i , labor l_i , and saving s_i . The three arguments of the utility function, in terms of the basic decision variables, are respectively as follows:

$$c_{i} = (1-\tau)(w_{i}l_{i} + \overline{r}e_{i}^{\gamma}a_{i}^{\rho}) + c_{m} - s_{i}$$

$$h_{i} = 1 - e_{i} - l_{i}$$

$$a_{i}^{e} = s_{i} + (1-\chi)a_{i}^{\rho}$$
(C.7)

The definition of leisure h_i is self-explanatory, and the definition of effective assets a_i^e has been discussed above. Turning to the definition of consumption (C.7), this equation is the result of successive substitution of three subsidiary equations into the logical definition $c_i = y_i - t_i - s_i$ where y_i is income, t_i is tax liability, and s_i is saving. First, tax liability is given by $t_i = \tau y_i - c_m$ where τ is the tax rate and c_m is "guaranteed minimum consumption" (C.6). This progressive income taxation function is analogous to the "negative income tax" function except that the floor expenditure of the household c_m guaranteed by the welfare system is expressed as a consumption level rather than as an income level.

The second subsidiary equation breaks total income down into labor income and property income: $y_i = w_i l_i + r_i a_i^{\rho}$, where w_i is the wage rate, r_i is the rate of return on initial financial assets, and a_i^{ρ} is initial financial assets (this form of C.5 incorporates C.2 and C.4 in the chapter appendix listing of the model equations). Initial financial assets (i.e., financial capital wealth) are beginning-of-period assets, as distinguished from end-of-period assets after saving has taken place.

The third subsidiary equation underlying the definition of consumption above determines the rate of return on financial assets as a function of the household's capital management effort:

$$r_i = \overline{r}e_i^{\gamma} \tag{C.3}$$

where \overline{r} is the "limit return," defined as the maximum return on assets which could be earned were the household to devote all its time to capital management effort ($e_i = 1$), and γ ($0 < \gamma < 1$) is the output elasticity of capital management effort. According to this function, the rate of return on financial assets is a concave increasing function of capital management effort, with a fixed upper limit of \overline{r} . This appears to be a reasonable approximation to the conditions under which property income on capital wealth is realized in the capitalist real world.

Proceeding on to the first-order conditions for the maximization of household utility with respect to e_i , l_i , and s_i , these are as follows in general terms:

$$\frac{\partial u_i}{\partial e_i} = \frac{\partial u_i}{\partial c_i} \frac{\partial c_i}{\partial e_i} + \frac{\partial u_i}{\partial h_i} \frac{\partial h_i}{\partial e_i} = \frac{\partial u_i}{\partial c_i} \frac{\partial c_i}{\partial e_i} - \frac{\partial u_i}{\partial h_i} = 0$$

$$\frac{\partial u_i}{\partial l_i} = \frac{\partial u_i}{\partial c_i} \frac{\partial c_i}{\partial l_i} + \frac{\partial u_i}{\partial h_i} \frac{\partial h_i}{\partial l_i} = \frac{\partial u_i}{\partial c_i} \frac{\partial c_i}{\partial l_i} - \frac{\partial u_i}{\partial h_i} = 0$$

$$\frac{\partial u_i}{\partial s_i} = \frac{\partial u_i}{\partial c_i} \frac{\partial c_i}{\partial s_i} + \frac{\partial u_i}{\partial a_i^e} \frac{\partial a_i^e}{\partial s_i} = -\frac{\partial u_i}{\partial c_i} + \frac{\partial u_i}{\partial a_i^e} = 0$$

These equations may be solved explicitly in a sequential fashion starting with e_i . From the first two, we have:

$$\frac{\partial c_i}{\partial e_i} = \frac{\partial c_i}{\partial l_i}$$

which may be solved for the supply of e_i as a function of household parameters alone:

$$e_i = \left[\frac{\gamma \overline{r} a_i^o}{w_i}\right]^{\frac{1}{1-\gamma}} \tag{C.9}$$

Thus e_i may be considered predetermined in the remaining factor supply equations for labor l_i and saving s_i . Solving for l_i and s_i from the last two first-order conditions above, we have:

$$l_{i} = (\varphi_{1} + \varphi_{3})(1 - e_{i}) - \varphi_{2} \frac{c_{m} + (1 - \tau)\overline{r}e_{i}^{\gamma}a_{i}^{\rho} + (1 - \chi)a_{i}^{\rho}}{(1 - \tau)w_{i}}$$
(C.10)

$$s_i = \varphi_3[c_m + (1 - \tau)\overline{r}e_i^{\gamma}a_i^{o} + (1 - \tau)w_i(1 - e_i)] - (\varphi_1 + \varphi_2)(1 - \chi)a_i^{o} \quad (C.11)$$

The comparative statics of the primary factor supply equations C.9 to C.11 are shown in Part A of Table 3.2 below (page 63). Most of the signs may be ascertained unambiguously. Exceptions include the effects of the two utility function parameters φ_1 and φ_2 on saving s_i , and the effects of the a_i^o parameter on labor l_i and saving s_i . The effects of φ_1 (the utility elasticity of consumption) and φ_2 (the utility elasticity of leisure) on saving are determined by the asset retention parameter χ : if χ is low (i.e., < 1), then high preferences for consumption and leisure will decrease saving, while if it is high (i.e., > 1), as in the numerical results reported below, then such high preferences increase saving. Similarly, the numerical value of χ helps to determine the effect of capital wealth a_i^{0} on labor and saving. If $\chi > 1$, then higher capital wealth will definitely decrease labor; while if $\chi < 1$, the effect of capital wealth on labor remains ambiguous. With respect to saving, if $\chi > 1$, then higher capital wealth will definitely increase saving; while if $\chi < 1$, then the effect of higher capital wealth on saving is ambiguous. For purposes of the present research in which $\chi = 1.01$, it can be said that higher wealth has an ambiguous effect on labor and a positive effect on saving.

Three of the household's parameters $(w_i, c_m, \text{ and } \overline{r})$ are determined at the aggregate level by the following equations:

$$w_i = \frac{\delta_i Q}{l_i} \tag{C.1}$$

$$c_m = \frac{\tau Q}{n} \tag{C.13}$$

$$\overline{r} = \frac{1 - \Sigma \,\delta_i}{\Sigma e^{\gamma} a_i^{\rho}} \tag{C.14}$$

The labor wage of household *i* is defined in equation C.1, according to the standard neoclassical theory, as the marginal product of its labor. Guaranteed minimum consumption is determined as shown in equation C.13 by the social budget constraint that the sum of tax revenues raised from households must equal total public expenditures. This defines the tax rate τ as a completely exogenous, socially determined parameter. Although the most natural interpretation of the model is probably that it excludes public goods and views all public expenditures as transfer payments through a tax and welfare system of greater or lesser progressivity depending on the value of τ , it might be permissible to envision c_m as including the per capita equivalent consumption value of pure public goods-this would imply simultaneous determination of both the progressivity of the tax-welfare system and the level of public spending. Finally, the limit return \overline{r} is determined as shown in equation C.14 by the aggregate economic constraint that the sum of household property incomes is equal to total output less total marginal productivity labor incomes. The "limit return" terminology derives from the fact that, considered as a parameter by the household under capitalism, \overline{r} is the highest possible rate of return on capital that could be obtained if all available time were devoted to capital management effort $(l_i = 0 \text{ and } e_i = 1)$.

The capitalist variant of the model may be solved over time by using the following transitional equations between period t and t+1 for, respectively, capital stock, factor productivity, and household capital wealth:

$$K_{t+1} = K_t + \Sigma s_{i,t} \tag{C.16}$$

$$A_{t+1} = (1+\rho)A_t$$
 (C.17)

$$a_{i,t+1}^{o} = a_{i,t}^{o} + s_{i,t} \tag{C.18}$$

These are identical to the pragmatic market socialist variant transitional equations except that the capital stock equation under socialism (S.18) allows supplementary capital accumulation from social saving (SS).

Although it is not possible to obtain analytical solutions for factor supplies as a function of the basic parameters of the general equilibrium model, the model is amenable to numerical solution once these parameters have been numerically specified. The capitalist variant of the model is solved by first specifying arbitrary levels of e_i and l_i . Q, \overline{r} , c_m and w_i are computed from their respective equations, and e_i and l_i are then re-computed using equations C.9 and C.10. This is continued until the e_i and l_i values converge. The solution process for the socialist model is closely analogous. Although convergence problems were encountered for some combinations of parameter values, in general this technique is fairly robust in producing numerical solutions of the model.

Turning to the pragmatic market socialist variant of the model, the essential distinction from capitalism lies in the distribution of property return. Property return itself is generated, as under capitalism, as a residual: national output less marginal product payments to labor. Instead of being distributed to private capital owners as under capitalism, under pragmatic market socialism a small proportion of property return would be retained by the Bureau of Public Ownership to cover its administrative and incentive expenses, and the remainder would go to the work force as a social dividend supplement to earned wage and salary income.

The pragmatic market socialist model uses the same parameters as the capitalist model, plus several more (termed "social ownership" parameters because they would be subject to social determination): α , μ , ν , *SS*, and ω_i . The retention coefficient (α) is the proportion of the aggregate property return produced by the publicly owned business enterprise sector which the Bureau of Public Ownership would be allowed to retain for the remuneration of its personnel. The assignment coefficient (μ) is the proportion of the labor force which the BPO would be allowed to hire as personnel. Both of these coefficients are social policy parameters which would be set by higher governmental authority at "low" levels. That both of these parameters should be "low" reflects the pro-socialist ideological judgment that capital property income under modern industrial conditions is "mostly" unearned. But exactly how low these parameters should be set is conceptually a difficult policy problem—though in practice the problem would probably be solved by commonsensical guestimation, perhaps guided by a modest amount of experimentation.

In actual fact the assignment coefficient (μ) used in the model does not represent BPO personnel as a proportion of the entire labor force, but rather BPO personnel as a proportion of the highest decile of the labor force. In other words, it is assumed that BPO personnel are taken from the highest decile only. It seems unrealistic to assume that BPO personnel would constitute a representative cross section of the population. The agents, to begin with, through the stipulation that they possess high level managerial experience, would clearly be drawn from the highest income strata. Many of the central office personnel would probably be highly educated professionals. It is envisioned that the agency would rely heavily on telecommunications and computer equipment, thus minimizing the need for lower level clerical staff.

Another justification for assuming that BPO personnel are drawn from the highest decile only is the principle of conservatism. This research endeavors to evaluate technically a policy proposal, i.e., establishing a pragmatic market socialist economy in an industrially advanced nation such as the United States, that many individuals would consider quite radical. Even though the proposal is in reality not nearly as radical as many would imagine, the fact remains that the technical evaluation should be relatively conservative in order to avoid overstating the advantages of the proposed change. Taking BPO employees from the highest decile of the population withdraws labor of the highest productivity from the production process: the output reduction owing to lost labor is substantially higher than it would be if BPO personnel represented a cross section of the entire population—that is, if they were taken from all deciles of the population. Therefore this aspect of the model may be justified not only on grounds of realism but of conservatism.

Using a proportion of a decile, rather than a proportion of the entire workforce, produces some conceptual subtleties. For the United States, for instance, the entire workforce can be roughly approximated as a hundred million households. There are thus ten million households in each decile. The model treats a decile as a single household: in effect all ten million households in a decile are assumed exactly the same and are represented by the number 1. If μ then equaled 0.01 (one percent), that would represent 100,000 identical households working for the BPO. Now consider, for example, the equation which gives the income of the typical BPO household under pragmatic market socialism:

$$y = \alpha \overline{r} (\mu e)^{\gamma} / \mu = \alpha \overline{r} \mu^{\gamma - 1} e^{\gamma}$$
(S.5')

The variable e (not subscripted because the *i* subscript represents an entire decile) is the capital management effort provided by the typical BPO household. This is multiplied up by the factor μ to get the total capital management effort which produces the total property return through a function exactly equivalent to the capitalistic rate of return function C.3. The BPO retains the proportion α of this property return. Retained return is then divided up among the BPO personnel households, which accounts for the use of μ as a divisor.

An analogous adjustment has to be made in the production function under pragmatic market socialism:

$$Q = AK^{\varepsilon}(\mu e)^{\gamma}[(1-\mu)l_1]^{\delta 1} \prod_{i=2}^{n} l_i^{\delta_i}$$
(S.12)

This equation shows total capital management effort as the e of each BPO household multiplied up by the number of BPO households. It also shows the total labor provision as the product of a term representing decile 1 labor (the amount l_i from each decile 1 household multiplied up by the number of non-BPO decile 1 households) with a term representing labor from the other nine deciles, based on the fact that all households in the other nine deciles provide labor. Additional implications of taking BPO personnel from

the first decile only will be discussed at various appropriate locations in the following.

The parameter v represents the proportion of social dividend income under pragmatic market socialism which is distributed as a flat-rate, per capita subsidy to the household. As emphasized above in the Chapter 2 description of the pragmatic market socialist proposal, the basic proposal envisions all or most of the social dividend fund being distributed to the working population in proportion to earned labor income. Even if all social dividend income were distributed in proportion to labor income, this would substantially increase economic equality, relative to capitalism, because under capitalism the distribution of capital property income follows the distribution of capital property wealth, which is highly unequal, while under pragmatic market socialism capital property income would mostly be converted into social dividend income (aside from retention by the BPO) and its distribution would follow that of labor income, which is much more equally distributed than is capital wealth under capitalism.

Nevertheless, since labor income is itself rather unequally distributed (though far less so than capital property income), the proposed labor-income-based distribution principle under pragmatic market socialism might entail an excessively unequal distribution of the social dividend fund in the minds of some individuals, particularly of those possessing what might be termed "traditional socialist" mentalities. In addition, some economic theorists might have a problem with "subsidizing labor," which is a possible interpretation of distributing the social dividend fund in proportion to household labor income. It is desired that we have some means of assessing these qualms. The pragmatic market socialist variant of the general equilibrium model therefore allows for the distribution of some part, or indeed all, of the social dividend fund as a flat-rate household subsidy. In the benchmark solutions discussed below in Chapter 4, the vparameter is set equal to 0, but some alternative solutions are obtained in which v is a positive number. By and large, these alternative solutions do not offer much support for the qualms noted above.

Social saving SS is an additional parameter under pragmatic market socialism which represents the amount allocated to business physical

capital investment from the national government budget. As discussed above, an essential element of the pragmatic market socialist proposal is that total saving for purposes of capital investment would definitely not be less than it is under capitalism at the present time. Therefore, if there were a decline in private household saving under socialism (for example, owing to the cessation of interest and other property return payments on the financial assets of households), then the gap would be filled in by social saving. Thus the pragmatic market socialist variant of the general equilibrium model requires this social ownership parameter.

Finally, the ω_i parameter represents the proportion of household *i* initial financial assets which would be compensated upon socialization. The compensation plan was among the topics discussed above in Chapter 2. According to this plan, low-to-medium-income households would have their capital assets fully compensated with cash, thus ω_i would definitely be unity for the low-to-medium population deciles. But this parameter would probably be less than unity for the highest deciles.

Under capitalism, unless its initial financial asset endowment is zero (see equation C.9), each household provides capital management effort in addition to ordinary labor. Under pragmatic market socialism, households specialize either in the provision of ordinary labor or in the provision of capital management effort. Non-BPO households provide only ordinary labor, while BPO households provide only capital management effort. This dichotomy is emphasized by differentiating equations pertaining to BPO households by a prime. Comparing the utility function (equation 8), the capitalist household utility function (equation C.8) contains both l and e, while under pragmatic market socialism the non-BPO household utility function (equation S.8) contains l but not e, while the BPO household utility function (equation S.8') contains e but not l (see page 48 above, and/or the chapter appendix).

For non-BPO households under pragmatic market socialism, wage and labor income for ordinary labor is determined by exactly the same marginal productivity pricing mechanism used by capitalism. As the reception of any sort of property income on financial assets would be illegal, the rate of property return on financial assets would be constrained to 0. However, to compensate for the loss of property income, the household would receive a flow of social dividend income which is not received under the capitalist system. As social dividend income would be proportional to regular wage and salary income, this institutional feature amounts to an across-the-board increase in the effective wage of labor. The higher effective wage of labor under socialism would be as follows:

$$w_i^* = \delta_i [1 + (1 - \nu)(1 - \alpha)(1 - (1 - \mu)\delta_1 - \Sigma_2 \delta_i)]Q/l_i$$
(S.3)

which replaces the rate of property return on financial assets of capitalism (equation C.3). Note that the bracketed term involves the social ownership parameters μ (the proportion of decile 1 households employed by the BPO), α (the BPO retention coefficient), and ν (the proportion of the social dividend fund distributed as a lump-sum payment). Similarly equation S.4 shows the social dividend income under pragmatic market socialism which would replace the capital property income of capitalism (equation C.4):

$$d_i = d_m + [(1 - v)(1 - \alpha)(1 - (1 - \mu)\delta_1 - \Sigma_2 \delta_i)]Q$$
(S.4)

where d_m is the flat-rate (or minimum) social dividend.

In equations S.3 and S.4, the term $\Sigma_2 \delta_i = \delta_2 + \delta_3 + \ldots + \delta_{10}$. The term $1 - (1-\mu)\delta_1 - \Sigma_2\delta_i$ therefore represents the proportion of national income represented by capital property income: total national income less marginal productivity labor payments to all deciles, bearing in mind that only the proportion $1-\mu$ of the first decile is engaged in labor, the remainder being BPO personnel. The proportion $1-\alpha$ of capital property income is available for social dividend distribution, the remainder being retained by the BPO. Of this, the proportion 1-vis devoted to social dividend payments in proportion to labor income, the remainder being devoted to lump-sum payments. The augmented wage under pragmatic market socialism is the original market wage based on the labor productivity coefficient δ_i , plus the proportion δ_i of that part of the social dividend fund distributed in proportion to labor income (see S.3). The total social dividend of a decile ihousehold is the lump-sum social dividend plus the social dividend distributed in proportion to labor income (see S.4).

The structure of taxation and the household utility maximization

motivation are presumed to be the same under pragmatic market socialism as under capitalism, for both non-BPO and BPO households. The factor supply equations for socialism are obtained from the budget-constrained utility-maximizing first-order conditions. The supply of labor and saving from non-BPO households are as follows:

$$l_{i} = (\varphi_{1} + \varphi_{3}) - \varphi_{2} \frac{c_{m} + d_{m} + (1 - \chi) a_{i}^{\varrho}}{(1 - \tau) w_{i}^{*}}$$
(S.10)

$$s_i = \varphi_3[c_m + d_m + (1 - \tau)w_i^*] - (\varphi_1 + \varphi_2)(1 - \chi)a_i^{\varphi}$$
(S.11)

These equations are analogous to the household factor supply equations for the respective factors under capitalism (C.10 and C.11), the distinctions being that since \bar{r} is effectively zero then $e_i = 0$ and γ is irrelevant, that w_i^* replaces w_i , and that the d_m term is added to the c_m term. Therefore the comparative statics properties of the labor and saving factor supply equations under pragmatic market socialism would be essentially the same as those under capitalism. The signs of the comparative statics derivatives of the factor supply equations of the non-BPO households are shown in Table 3.2 below, Part B.i (page 63).

The factor supply equations of the BPO households under pragmatic market socialism are also obtained from utility maximization subject to a budget constraint, and are as follows:

$$\gamma e^{\gamma - 1} - Be^{\gamma} - C = 0$$
(S.9')
where $B = \gamma + \frac{\varphi_2}{\varphi_1 + \varphi_3}$ $C = \frac{\varphi_2}{\varphi_1 + \varphi_3} \frac{c_m + (1 - \chi)a^o}{(1 - \tau)\alpha \bar{r}\mu^{\gamma - 1}}$
 $s = \frac{\varphi_3}{\varphi_1 + \varphi_3} [c_m + (1 - \tau)\alpha \bar{r}\mu^{\gamma - 1}e^{\gamma}] - \frac{\varphi_1}{\varphi_1 + \varphi_3} (1 - \chi)a^o$ (S.11')

Note the absence of the "i" subscript for the BPO households. This is because the "i" refers to a decile of the population and BPO households are drawn exclusively from the first decile. Note also that the equation for supply of capital management effort by BPO households is not explicitly solvable for e. The supply of e is implicit in S.9' rather than explicitly determined. Finally, note that e appears as

. 1

an argument in the saving supply function. The equations are solved sequentially as in the case of the household under capitalism: first e is determined by S.9', then e may be used as a determinant of s as shown in S.11'.

To verify S.9', consider that the first-order constrained utility maximization conditions $du/de = du/da^e = 0$ lead respectively to:

$$\frac{\varphi_1}{\varphi_2} \frac{1-e}{(1-\tau)y+c_m-s} = \frac{1}{\gamma(1-\tau)\alpha \bar{r}\mu^{\gamma-1}e^{\gamma-1}}$$
$$\frac{\varphi_1}{\varphi_3} \frac{s+(1-\chi)a^o}{(1+\tau)y+c_m-s} = 1$$

Solve both of the above for s, then equate s to itself. Simplication of the resulting equation leads to S.9'.

The signs of the comparative statics derivatives of the factor supply equations of the BPO households are shown in Table 3.2, Part B.ii. In contrast to all households under capitalism and non-BPO households under pragmatic market socialism, the comparative statics effects for the BPO households under pragmatic market socialism are generally ambiguous. Owing to the fact that the *e*-supply equation for BPO households is not explicitly solvable for *e*, comparative statics derivatives must be evaluated by implicit differentiation rather than explicit differentiation. Examination of the implicit derivatives shows many of them to be influenced by either $(1-\chi)a^{o}$ or $c_m+(1-\chi)a^{o}$. Since $1-\chi$ may be either positive or negative, any expression in which it occurs is inherently of ambiguous sign. Note, however, that where comparative statics signs may be ascer-

tained, they are consistent with those from the other two household models (all households under capitalism, and non-BPO households under pragmatic market socialism).

Table 3.1 is provided to facilitate comparison of the factor supply functions for the three household models, and Table 3.2 contains the comparative statics sign analysis for these three models.

In the case of the capitalist model, the three household parameters w_i , c_m and \overline{r} , are determined at the aggregate level by equations C.1, C.13, and C.14. In the case of the pragmatic socialist model, as between the two types of household (non-BPO and BPO), there are

TABLE 3.1Household Factor Supply Functions

Capital Management Effort

Capitalism

 $e_i = \left[\frac{\bar{\gamma r} a_i^{o}}{w_i}\right]^{\frac{1}{1-\gamma}}$

Socialism, non-BPO not applicable

Socialism, BPO
$$\gamma e^{\gamma - 1} - Be^{\gamma} - C = 0$$

where $B = \gamma + \frac{\varphi_2}{\varphi_1 + \varphi_3}$ $C = \frac{\varphi_2}{\varphi_1 + \varphi_3} \frac{c_m + (1 - \chi)a^o}{(1 - \tau)\alpha r \mu^{\gamma - 1}}$

Labor

Capitalism
$$l_{i} = (\varphi_{1} + \varphi_{3})(1 - e_{i}) - \varphi_{2} \frac{c_{m} + (1 - \tau)\overline{r}e_{i}^{\gamma}a_{i}^{\rho} + (1 - \chi)a_{i}^{\rho}}{(1 - \tau)w_{i}}$$

Socialism, non-BPO
$$l_{i} = (\varphi_{1} + \varphi_{3}) - \varphi_{2} \frac{c_{m} + d_{m} + (1 - \chi)a_{i}^{\rho}}{(1 - \tau)w_{i}^{*}}$$

Socialism, BPO not applicable

Saving

Capitalism $s_i = \varphi_3[c_m + (1-\tau)\overline{r}e_i^{\gamma}a_i^{\rho} + (1-\tau)w_i(1-e_i)] - (\varphi_1 + \varphi_2)(1-\chi)a_i^{\rho}$

Socialism, non-BPO

$$s_i = \varphi_3[c_m + d_m + (1 - \tau)w_i^*] - (\varphi_1 + \varphi_2)(1 - \chi)a_i^O$$

Socialism, BPO

$$s = \frac{\varphi_3}{\varphi_1 + \varphi_3} \left[c_m + (1 - \tau)\alpha \overline{r} \mu^{\gamma - 1} e^{\gamma} \right] - \frac{\varphi_1}{\varphi_1 + \varphi_3} (1 - \chi) a^{\alpha}$$

TABLE 3.2 Signs of Comparative Statics Derivatives of Household Factor Supply Functions

A. Under Capitalism: All Households

	parameters									
variables	φ1	φ2	φ3	χ	wi	ai ⁰	\overline{r}	γ	τ	Cm
ei	0	0	0	0	_	+	+	+	0	0
li	+	-	+	+	+	?	—	-		_
Sį	?	?	+	+	+	?	+	+	_	+

B.i. Under Socialism: Non-BPO Households

	parameters								
variables	φ1	φ2	φ3	χ	wi [*]	a_i^Q	dm	τ	Ст
li	+	_	+	+	+	?	_	-	_
Si	?	?	+	+	+	?	+	_	+

B.ii. Under Socialism: BPO Households

				par	amete	meters					
variables	φ1	φ2	φ3	χ	a ^o	\overline{r}	γ	τ	Ст	α	μ
е	?	?	?	+	?	?	?	?	_	?	?
S	?	?	?	+	?	+	+	—	+	+	_

four household parameters determined at the aggregate level: w_i^* , c_m , \overline{r} , and d_m . The determination of w_i^* by S.3 has already been discussed. The other three household parameters are determined respectively by:

$$c_m = \frac{\tau Q - SS}{n} \tag{S.13}$$

$$\overline{r} = \frac{(1 - [\Sigma \delta_i^*]')Q - (n - \mu)d_m}{\alpha(\mu e)^{\gamma}}$$
(S.14)

where
$$[\Sigma \delta_{i}^{*}]' = (1-\mu)\delta_{1}^{*} + \Sigma_{2}\delta_{i}^{*}$$

 $\delta_{i}^{*} = \delta_{i}[1 + (1-\nu)(1-\alpha)(1 - [\Sigma \delta_{i}]')]$
 $[\Sigma \delta_{i}]' = (1-\mu)\delta_{1} + \Sigma_{2}\delta_{i}$
 $d_{m} = \frac{\nu(1-\alpha)(1 - [\Sigma \delta_{i}]')Q}{n-\mu}$ (S.15)

S.13 is equivalent to C.13, with the exception that government revenues may be spent on social saving SS as well as the minimum consumption entitlement c_m . The determination of the limit return \overline{r} in S.14 is considerably more complicated than its capitalist model analogue C.14. The factor $[\Sigma \delta_i]'$ represents the proportion of national income going directly to marginal productivity labor payments, bearing in mind that only the proportion $1-\mu$ of decile 1 households engage in labor provision (the balance of decile 1 households being employed by the BPO). One minus this factor represents capital property return as a proportion of national income. The term δ_i^* therefore represents the social dividend augmented labor income of decile *i* as a proportion α of capital property return, and the proportion ν of the remaining social dividend fund is allocated to flat-rate payments.

The constraint determining \overline{r} may be stated, first in words and then symbolically, as follows:

output =

decile 1 capital management income (BPO households)

+ total labor-based decile 1 income (to non-BPO households)
+ decile 1 flat-rate social dividend (to non-BPO households)
+ total labor-based decile 2 to decile n income
+ decile 2 to decile n flat-rate social dividend

$$Q = \alpha \overline{r}(\mu e)^{\gamma} + (1-\mu)\delta_1^* Q + (1-\mu)d_m + \Sigma_2 \delta_i^* Q + (n-1)d_m$$
$$Q = \alpha \overline{r}(\mu e)^{\gamma} + [\Sigma \delta_i^*]' Q + (n-\mu)d_m$$

The factor $[\Sigma \delta_i^*]'$ represents the proportion of national income going to all labor-based payments, including direct marginal productivity payments plus labor-income-based social dividend payments, once again bearing in mind that only the proportion 1- μ of decile 1 households engage in labor provision. S.14 follows directly from the last equation.

Finally, the social ownership parameter d_m is determined in S.15 as the proportion v of the total social dividend fund, divided by the number of households having an entitlement to social dividend income: all decile 2 through decile 10 households, plus non-BPO decile 1 households (given by the proportion μ of decile 1 households). This number is expressed as $n-\mu$.

The solution procedure for the pragmatic market socialist model parallels that of the capitalist model, except that since the supply function for capital management effort (S.9') is not explicitly solvable for e, an extra step is added to the overall iterative process. A subsidiary iterative process using equation S.9' must be added to determine e.

B. Numerical Implementation

Table 3.4 shows the values of the parameters utilized to obtain the benchmark solutions reported in Chapter 4, Section A. Setting A (initial total factor productivity) and K (initial capital stock) equal to 1.0 is a convenience which does does affect the generality of the results. However, skeptics of socialism might object to allowing the same ρ (rate of growth of total factor productivity, i.e., disembodied technological progress) for socialism as for capitalism (0.01), on the basis of the oft-repeated charge that whatever the static efficiency of

socialism relative to capitalism, its relative dynamic performance would be deficient owing to inadequate incentives to innovation, risk-taking, entrepreneurship, and so on. This important issue will be considered in the overall evaluation of the research contained in Chapter 5 below (specifically in pages 118-122).

As indicated above, in the numerical implementation of the model the n brackets are represented by 10 income deciles of U.S. households. Decile 1 is the richest decile and decile 10 the poorest decile. It is assumed that the rankings of a_i^o (decile *i* initial financial assets as a proportion of total initial financial assets) and δ_i (decile i labor income as a proportion of national income) are the same: that is, the richest decile in terms of financial assets is also the richest decile in terms of labor income, and so on. Reference to any issue of the annual Internal Revenue Service publication Statistics of Income: Individual Income Tax Returns will show that while the proportion of labor income to total income decreases sharply in the highest income brackets, the average labor income increases steadily throughout all income brackets. It would seem that even among the richest strata in society, in which total income is heavily dominated by various forms of property income, labor income is very high in an absolute sense.

The values of a_i^{o} and δ_i shown in Table 3.4 are hypothetical, but they have an empirical foundation as explained in Table 3.3. Table 3.3 shows in the leftmost column (Set A) the values of these parameters utilized in the author's article on the equity-efficiency tradeoff under capitalism and pragmatic market socialism (Yunker, 1991). This article undertook the same task as the present research, but utilized a much simpler general equilibrium model without saving or capital management effort.

The Set A estimates of a_i^{Q} shown in Table 3.3 were obtained from two tables in the Projector-Weiss report on the 1963 Federal Reserve Board wealth-income survey.²⁴ Table A10, Part B, shows "mean investment assets" by brackets of "size of portfolio." The estimated number of U.S. households in each such bracket is shown in Table A36. Thus the cumulative percentage of households can be associated with the cumulative percentage of investment assets. The correspond-

TABLE 3.3 Development of a_i^{ρ} and δ_i Parameter Values

 a_i^o Values

household	Set A	Set B
1	0.885733	0.7273176
2	0.079512	0.2088890
3	0.021958	0.0515037
4	0.009220	0.0104537
5	0.002384	0.0016421
6	0.001113	0.0001814
7	0.000040	0.0000120
8	0.000038	0.0000003
9	0.000000	0.0000000
10	0.000000	0.0000000

GA = .86 GA = .85

 δ_i Values

household	Set A	Set B	Set C
1	0.176205	0.1572307	0.1700
2	0.136733	0.1394828	0.1350
3	0.124650	0.1218955	0.1200
4	0.093125	0.1044884	0.1000
5	0.089740	0.0872873	0.0850
6	0.061495	0.0703268	0.0650
7	0.054077	0.0536574	0.0550
8	0.025506	0.0373576	0.0300
9	0.019234	0.0215723	0.0220
10	0.019234	0.0067014	0.0180
	GL = .359	GL = .350	GL = .345
Utility function:

(i.e., $\psi_2 = 3.00, \psi_3 = 0.10$)

 $\phi_1 = 0.2439$

 $\phi_2 = 0.7317$

 $\varphi_3 = 0.0244$

 $\chi = 1.01$

Production function: $A_1 = 1.0$ $K_1 = 1.0$ $\rho = 0.01$ $\varepsilon = 0.19$ $\gamma = 0.01$

Tax policy:Social ownership policy: $\tau = 0.40$ $\alpha = 0.05$ $\mu = 0.10$ $\nu = 0.0$ SS = 0.0 in Table 4.1 Cases i-iiSS = 0.0016 in Table 4.1 Case iii

Household-specific parameters:

household	labor pro-	initial financial	compe	nsation
i	ductivity	asset distribution	distribution a	
	δ_i a_i^o		full	partial
1	.1700000	.7273176	1.00	0.61258
2	.1350000	.2088890	1.00	0.86578
3	.1200000	.0515037	1.00	0.95965
4	.1000000	.0104537	1.00	0.98992
5	.0850000	.0016421	1.00	0.99805
6	.0650000	.0001814	1.00	0.99974
7	.0550000	.0000120	1.00	0.99998
8	.0300000	.0000003	1.00	1.00000
9	.0220000	.0000000	1.00	1.00000
10	.0180000	.0000000	1.00	1.00000
	GL=.3455	GA=.8500	CC=1	CC=0.90

ing figures for population deciles are obtained by linear interpolation.

The Set A estimates of δ_i are also based on two tables in the Projector-Weiss report, supplemented by a third table in a contemporaneous issue of the IRS *Statistics of Income: Individual Income Tax Returns* series. Table A33 in Projector-Weiss shows mean 1962 income by size of portfolio of investment assets, while Table A36 is used again for the number of households in each size of portfolio bracket. Table 2 of the IRS publication is used to estimate the labor income of each bracket from the information on total income given in Projector-Weiss. Again, linear interpolation is used to convert data source brackets into population deciles. The incremental proportions of labor income for the ten deciles are multiplied by 0.8 to obtain the Set A δ_i estimates, reflecting the assumption that labor income represents 80 percent of national income.

The Gini coefficient GA for the Set A financial asset distribution shown in Table 3.3 is .866, while the Gini coefficient GL for the Set A labor productivity distribution is .359. As the Set A figures are derived from a somewhat dated source and since the financial asset distribution is in any event a rather unsettled matter, a convenient method for assessing the effect of different financial asset distributions on the model solution is desirable. Although the matter is not as important, such a method could also be used to obtain hypothetical distributions of labor productivity of varying degrees of inequality. The method utilized herein for these purposes is described in the following.

A hypothetical Lorenz curve in the standard convex upward-sloping form may be constructed using the function $y = x^g$, where x is the cumulative proportion of the population, y is the cumulative proportion of financial assets, and g is a parameter greater than 1. The Gini coefficient of such a Lorenz curve is then given by G = (g-1)/(g+1), while the g coefficient corresponding to a particular Gini coefficient G is g = (1+G)/(1-G). One may therefore specify a Gini coefficient G, compute the corresponding g coefficient, and then compute the $y = x^g$ function values over a range of x (in this case x starts with .10, and then increments by .10 until 1.0 is reached).

Set B of the a_i^o coefficients was obtained using the $y = x^g$ function for a Gini coefficient of .850 (a slight downward rounding of the

empirical GA for the financial asset distribution of .866). Set B of the δ_i coefficients was computed using the $y = x^g$ function for a Gini coefficient of .350 (a slight downward rounding of the empirical GL for the labor productivity distribution of .359). Use of the Set B labor productivity coefficients was, however, precluded by an unanticipated problem. Using the other benchmark parameter values, with the Set B labor productivity coefficients the solution procedure fails because labor in decile 10 is negative. Apparently the δ_i value of 0.0067014 is too small. Noting the fact that this value is substantially below the empirical δ_i of 0.019234, it was decided to abandon the hypothetical distribution on δ_i obtained with the $y = x^g$ function. Instead, the Set C "schematic" distribution on labor productivity parameters is used. This distribution simplifies the empirical distribution, and also corrects the paradoxical feature of the empirical distribution that $\delta_9 = \delta_{10}$. (This feature was caused by the use of linear interpolation to translate from data source brackets to population deciles.)

It was determined by experiment that the benchmark solution obtained using the Set B a_i^{o} hypothetical parameter values and the Set C δ_i "schematic" parameter values differs only marginally from a solution obtained using the Set A empirical a_i^{o} parameter values and the Set A δ_i empirical parameter values. As the former parameter values are not as source-specific (and possibly dated) as the latter, the former are used as the benchmark values in the solutions reported in Chapter 4 below. The sensitivity analysis reported in Section B of Chapter 4 includes examination of the effects of downward variation in the inequality of the capital asset distribution. This analysis meets the potential objection that the substantive results are critically dependent on an unrealistically high level of inequality in capital wealth ownership.

As just discussed, a method is applied herein for the construction of hypothetical capital wealth distributions of varying degrees of inequality. A somewhat analogous method is utilized to examine variation in the level of compensation. To represent a compensation function giving ω_i as a function of *i* (in proportional terms), one may use $y = 1-x^f$, where f > 1 (i.e., x = i/10 and $y = \omega_i$). This form produces a concave downward-sloping curve between the points (0,1) and (1,0), representing decreasing compensation as the wealth level rises. CC (for "compensation coefficient") is defined as the unweighted average of ω_i . The area under the $y = 1-x^f$ function may be identified with CC, thus for a given CC, f = CC/(1-CC). Evaluating the function $y = 1-x^f$ at x = 0.0 through x = 0.9 gives ω_i for respectively i = 10 through 1. This provides a convenient method for creating ω_i distributions reflecting lower levels of compensation.

The key benchmark solution reported in Section A of Chapter 4 below utilizes the ω_i coefficients shown in the "partial" column in Table 3.4 (CC = 0.90). But a "preliminary" benchmark solution is also obtained for full compensation ($\omega_i = 1.00$, all *i*, and CC = 1.00, as shown in the "full" column in Table 3.4). The significance of partial versus full compensation is discussed below in Chapter 4, Part A.

The benchmark value of the asset retention parameter χ in the utility function, as already discussed (page 49 above), is set equal to 1.01. The other utility function parameters for the benchmark case are set by an elementary calibration method which relates these parameters to (more or less) intuitively comprehensible concepts. Let $\psi_2 = \varphi_2/\varphi_1$, and let $\psi_3 = \varphi_3/\varphi_1$. Given the linear homogeneity assumption on the utility function, we then have that $\varphi_1 = 1/(1+\psi_2+\psi_3)$, $\varphi_2 = \psi_2/(1+\psi_2+\psi_3)$, and $\varphi_3 = \psi_3/(1+\psi_2+\psi_3)$. From the utility maximization conditions, it is also known that $\psi_2 = (1-\tau)w_i(1-l_i-e_i)/c_i$ (in the capitalist variant of the model), while $\psi_3 = a_i^e/c_i$. Thus, ψ_2 can be interpreted as the ratio of potential after-tax labor income to consumption if all leisure time were instead devoted to labor, while ψ_3 can be interpreted as the ratio of effective financial assets to consumption.

Using $\psi_2 = 3.00$ and $\psi_3 = 0.10$ produces the φ_1 , φ_2 , and φ_3 values shown in Table 3.4, and these values in turn (together with $\chi = 1.01$) produce for the capitalist period-1 benchmark solution, displayed below in Table 4.2, labor times as proportions of total time ranging from about .07 to .17, and saving rates on income ranging from about 12 percent to 25 percent. Although these results seem reasonably acceptable, the rather imponderable nature of the utility function parameters requires a sensitivity analysis. It turns out that within wide ranges of variation around the Table 3.4 benchmark values, the qualitative conclusions to be derived from the experiment are not affected by different utility function parameter values (see Chapter 4, Section B below).

The parameter τ , a social choice variable, may be designated a "marginal tax rate" since it is the slope of a linear household net burden function. It may also be designated the "aggregate average tax rate" because it represents taxes as a proportion of national income. Herein it is simply designated a generic "tax rate." This tax rate is the model indicator of the degree of social redistribution of market income, and by allowing it to vary we may conveniently estimate the equity-efficiency tradeoff and the social welfare function for both the capitalist and the pragmatic market socialist economies. This comparison is instructive and is undertaken in Chapter 4, Section A.

The benchmark value of τ is taken to be .40 for two reasons. First, in the United States at the present time, government revenues over all levels of government lie in the range from about 35 to 40 percent of national income. Thus $\tau = .40$ is an approximation to the real-world value. Second, it turns out that for both the capitalist and socialist variants of the model, a τ of approximately .40 maximizes the sum of utilities over the households. Thus the comparison is approximately at the optimal taxation-redistribution point for both economies, which seems appropriate.

The γ parameter, the elasticity of output with respect to capital management effort, is intuitively the most ideologically sensitive of the model parameters, and the results of the model solutions bear out this intuition. The Cobb-Douglas production function is assumed linear homogeneous, and as noted above, $\Sigma \delta_i$ is assumed to equal 0.8. Therefore the γ and ε parameters sum to 0.2. An extreme "procapitalist" assumption would be that $\gamma = 0.2$ and $\varepsilon = 0.0$; while an extreme "pro-socialist" assumption would be that $\gamma = 0.2$ and $\varepsilon = 0.2$. An intermediate assumption would put γ somewhere between 0.0 and 0.2. The benchmark value of $\gamma = 0.01$ shown in Table 3.4 is much closer to 0.0 than it is to 0.2. Lest this benchmark value elicit suspicion that the author is "assuming that which is to be proved," it must be emphasized that this value does indeed have an empirical foundation—albeit a tenuous one.

The empirical foundation for the benchmark γ value is data from

the 1971 Purdue University Survey of the Individual Investor, which has been utilized by Timothy Krehbiel and myself to estimate a supply function of capital management effort for the individual investor (Yunker and Krehbiel, 1988). The data set consisted of 911 individuals active in the stock market in the early 1970s (the survey was conducted with the support of a major brokerage house). The study estimates a supply function of capital management effort in the form:

 $t = (1/g) \log[R(a/b)gK]$

where $t = \text{time spent on investment analysis (hours per month)}, K = capital wealth, <math>(a/b) = \text{ratio of consumption preference to leisure preference (assumed a multiplicative function of several exogenous variables such as age, sex, marital status, and so on), and R and g are parameters to be estimated. This form of the investment analysis supply function is based on a so-called "plateau" productivity function relating investment analysis time to achieved rate of return in the form:$

r = R[1 - exp(-gt)]

The general equilibrium model developed in this research uses for this function $r_i = \overline{re_i^{\gamma}}$, where *e* is the analogue of *t*. Adjusting for units of measure between *t* and *e* (*t* in hours per month and *e* as a proportion of time), these two functions produce similar r_i productivity curves. An effort to estimate the capital management effort supply function used in the model (equation C.9) from the Individual Investor data set resulted in an estimate of γ of 0.000004741. But the model is undefined for $\gamma = 0$, and this value is too close to 0 to be practicable. Instead an estimate of γ is based on the elasticity of the plateau rate of return function evaluated at the mean (9.18 hours of investment analysis time per month). From the estimated *g* (0.695), this elasticity is computed to be 0.0108395. From this background the benchmark γ value is specified as 0.01.

Turning now to the additional social ownership policy parameters under socialism, the benchmark values of the assignment coefficient (μ) and retention coefficient (α) are based on an unpublished theoretical study by the author (1989). Using a general equilibrium model similar to the present model but without differentiation of household labor, an analytical function is derived relating a Benthamite (sum of utilities) social welfare measure to these coefficients, the utility function parameter values, and the production function parameter values (δ = output elasticity of ordinary labor and γ = output elasticity of capital management effort).²⁵ Maximizing this function with respect to the assignment and retention coefficients, the social welfare maximizing values of μ and α are respectively:

$$\mu * = \gamma / (\delta + \gamma) \qquad \qquad \alpha * = \gamma / (\delta + \gamma - \delta^2)$$

Converting these to the present notation and incorporating the fact that assignment is from the highest decile only and there are 10 deciles, they may be re-stated:

$$\mu * = 10\gamma/(\Sigma\delta_i + \gamma) \qquad \alpha * = \gamma/(\Sigma\delta_i + \gamma - [\Sigma\delta_i]^2)$$

Substituting in $\Sigma \delta_i = 0.8$ and $\gamma = 0.01$ and rounding downward, we obtain the benchmark parameter values: $\mu = 0.10$ and $\alpha = 0.05$.

These values are sufficiently small to be usable in the benchmark case (recall that by the pro-socialist presumption that capital property income is "mostly" unearned, these parameters must be small numbers). However, as discussed below (Chapter 4, Section A, pages 90-92), both the benchmark α and μ values are probably too large in a practical policy sense.

The proportion of social dividend income (v) distributed in the form of lump-sum payments, as discussed above (page 57) is presumed to be 0 in the benchmark case: in other words, the entire social dividend fund is distributed in proportion to earned labor income. However, alternative solutions obtained for v > 0 are also reported and discussed in Chapter 4 below.

The final social ownership policy variable under pragmatic market socialism is SS, the level of social saving. Actually, this variable might also be realistically utilized in the capitalist variant of the model. Social saving is defined as government tax revenue allocated to investment in business sector physical capital stock. Under capitalism, of course, such a disposition of government tax revenue is very unusual—but not entirely unknown. The SS variable is added mainly to allow for social saving under pragmatic market socialism

to take up the slack from a potential decline in private saving owing to the cessation of payment of capital property return on private savings accumulations. The issue of potential social saving under pragmatic market socialism is discussed in the "preliminary" benchmark solutions reported below in Chapter 4, Section A.

Chapter 3 Appendix A General Equilibrium Model for the Evaluation of **Capitalism versus Pragmatic Market Socialism**

Capitalist Variant

Parameters

Production function:

- A1 initial total factor productivity
- rate of growth, total factor prod. ρ
- **K**1 initial capital stock
- output elasticity of capital ε
- output elas. of capital manageγ ment effort
- δi output elas. of household i labor

 $(\varepsilon + \gamma + \Sigma \delta_i = 1)$

Tax policy:

tax rate τ

Endogenous Variables (#) Households (i = 1,...,n)

Equations

 $w_i = \frac{\delta_i Q}{l_i}$ (C.1) wage wi

- $y_i^W = w_i l_i$ v_i^w labor income (C.2) $r_i = \overline{r}e_i^{\gamma}$ (C.3) rate of return ri
- Pi
- Уi
- $p_i = r_i a_i^0$ property income (C.4)
- $v_i = v_i^W + p_i$ (C.5) total income
- tax burden (C.6) $t_i = \tau y_i - c_m$ ti

- Utility function:
- **Ø**1 utility elas. of consumption
- φ_2 utility elas. of leisure
- Φ3 utility elas. of effec. assets

 $(\phi_1 + \phi_2 + \phi_3 = 1)$

asset maintenance coeff. χ

Historical/institutional:

 a_i^{O} initial assets, household i

(C.7) $c_i = y_i - t_i - s_i$ consumption Ci (C.8) $u_i = c_i^{\varphi_1} (1 - l_i - e_i)^{\varphi_2} (s_i + (1 - \chi)a_i^Q)^{\varphi_3}$ utility Ui $e_i = \left[\frac{\gamma \bar{r} a_i^{Q}}{w_i}\right]^{1-\gamma}$ (C.9) cap. man. effort ei (C.10) li labor $l_{i} = (\phi_{1} + \phi_{3})(1 - e_{i}) - \phi_{2} \frac{c_{m} + (1 - \tau)\overline{r}e_{i}^{\gamma}a_{i}^{\rho} + (1 - \chi)a_{i}^{\rho}}{(1 - \tau)w_{i}}$ saving (C.11) Si $s_{i} = \varphi_{3}[c_{m} + (1-\tau)\overline{re}_{i}^{\gamma}a_{i}^{\rho} + (1-\tau)w_{i}(1-e_{i})] - (\varphi_{1} + \varphi_{2})(1-\chi)a_{i}^{\rho}$

Aggregate:

Q	total output	(C.12)	$Q = AK^{\varepsilon} \left[\sum_{i=1}^{n} e_i \right]^{\gamma} \prod_{i=1}^{n} l_i^{\delta_i}$
Cm	min. consump.	(C.13)	$c_m = \frac{\tau Q}{n}$
r	limit return	(C.14)	$\overline{r} = \frac{1 - \Sigma \delta_i}{\Sigma e_i^{\gamma} a_i^{\varphi}}$

Transition from period t to t+1:

Kţ	capital stock	(C.16)	$K_{t+1} = K_t + \Sigma s_{i,t}$
At	factor productiv.	. (C.17)	$A_{t+1} = (1+\rho)A_t$
ai ⁰	household assets	s (C.18)	$a_{i,t+1}^{O} = a_{i,t}^{O} + s_{i,t}$

Pragmatic Market Socialist Variant

Parameters

 A_1

Production function:

Utility function:

- ϕ_1 utility elas. of consumption
- ρ rate of growth, total factor prod.

initial total factor productivity

- K₁ initial capital stock
- ε output elasticity of capital
- φ2 utility elas. of leisureφ3 utility elas. of effec. assets
- $(\varphi_1+\varphi_2+\varphi_3=1)$

output elas. of capital manage-

output elas. of household i labor

ment effort

γ

δi

 a_i^o initial assets, household i $(\varepsilon + \gamma + \Sigma \delta_i = 1)$ Social ownership policy: Tax policy: BPO retention coeff. α τ tax rate BPO assignment coeff. μ flat-rate distribution coeff. ν SS social saving compensation coeff. ωi **Endogenous Variables** (#) Equations Non-BPO Households (i = 1,...,n)(S.1) $w_i = \frac{\delta_i Q}{l_i}$ wage wi (S.2) $v_i^W = w_i l_i$ v_i^W labor income w_i^* effective wage (S.3) $w_i^* = \delta_i [1 + (1 - v)(1 - \alpha)(1 - (1 - \mu)\delta_1 - \Sigma_2 \delta_i)]Q/l_i$ soc. div. income (S.4) di $d_i = d_m + [(1-v)(1-\alpha)(1-(1-\mu)\delta_1 - \Sigma_2\delta_i)]Q_i$ $(S.5) \qquad y_i = y_i^W + d_i$ total income Vi $(S.6) t_i = \tau y_i - c_m$ tax burden ti consumption (S.7) $c_i = y_i - t_i - s_i$ Ci (S.8) $u_i = c_i^{\varphi_1} (1-l_i)^{\varphi_2} (s_i + (1-\chi)a_i^{\varrho})^{\varphi_3}$ utility ui (S.10) $l_i = (\varphi_1 + \varphi_3) - \varphi_2 \frac{c_m + d_m + (1 - \chi)a_i^{\nu}}{(1 - \tau)w_i^*}$ labor li (S.11) saving Sį $s_i = \varphi_3[c_m + d_m + (1 - \tau)w_i^*] - (\varphi_1 + \varphi_2)(1 - \chi)a_i^{Q}$

asset maintenance coeff.

Historical/institutional:

X

--

BPO households:

(S.5') $y = \alpha \overline{r} (\mu e)^{\gamma} / \mu = \alpha \overline{r} \mu^{\gamma - 1} e^{\gamma}$ total income y $(S.6') \qquad t = \tau y - c_m$ t tax burden (S.7') c = y - t - sconsumption С (S.8') $u = c^{\varphi_1} (1-e)^{\varphi_2} (s+(1-\chi)a^o)^{\varphi_3}$ utility u cap. man. effort (S.9') $\gamma e^{\gamma - 1} - Be^{\gamma} - C = 0$ е where $B = \gamma + \frac{\varphi_2}{\varphi_1 + \varphi_3}$ $C = \frac{\varphi_2}{\varphi_1 + \varphi_3} \frac{c_m + (1 - \chi)a^o}{(1 - \tau)\alpha r \mu^{\gamma - 1}}$ (S.11') S saving $s = \frac{\varphi_3}{\varphi_1 + \varphi_3} \left[c_m + (1 - \tau) \alpha \overline{r} \mu^{\gamma - 1} e^{\gamma} \right] - \frac{\varphi_1}{\varphi_1 + \varphi_3} (1 - \chi) a^o$

Aggregate:

$$Q \quad \text{total output} \quad (S.12) \quad Q = AK^{\varepsilon}(\mu e)^{\gamma}[(1-\mu)l_1]^{\delta 1} \prod_{i=2}^{n} l_i^{\delta i}$$

$$c_m \quad \text{min. consump.} \quad (S.13) \quad c_m = \frac{\tau Q - SS}{n}$$

$$\overline{r} \quad \text{limit return} \quad (S.14) \quad \overline{r} = \frac{(1-[\Sigma\delta_i^*]')Q - (n-\mu)d_m}{\alpha(\mu e)^{\gamma}}$$
where $[\Sigma\delta_i^*]' = (1-\mu)\delta_1^* + \Sigma_2\delta_i^*$
 $\delta_i^* = \delta_i[1 + (1-\nu)(1-\alpha)(1-[\Sigma\delta_i]')]$
 $[\Sigma\delta_i]' = (1-\mu)\delta_1 + \Sigma_2\delta_i$

$$d_m \quad \text{min. soc. div.} \quad (S.15) \quad d_m = \frac{\nu(1-\alpha)(1-[\Sigma\delta_i]')Q}{n-\mu}$$

Transition from period t to t+1:

Kt	capital stock	(S.16)	$K_{t+1} = K_t + \Sigma s_{i,t} + SS_t$
At	factor productiv.	(S.17)	$A_{t+1} = (1+\rho)A_t$
a_i^0	household assets	(S.18)	$a_{i,t+1}^{O} = a_{i,t}^{O} + s_{i,t}$

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Results

A. Benchmark Solutions

Table 4.1 displays various aggregate indicators for three cases of the benchmark solution, using the Table 3.4 parameter values, for the initial period (t = 1), and also for a future period (t = 25) approximately one generation later, interpreting time periods as years. The aggregate indicators include output/income ($Q = \Sigma y_i$), the Gini coefficient of consumption (GC = consumption Gini), the Benthamite social welfare measure sum of utilities ($SW = \Sigma u_i$), private saving ($PS = \Sigma s_i$), social saving (SS), total saving (TS = PS + SS), and next-period capital ($K_{t+1} = K_t + TS_t$).

The first case (Case i) assumes full compensation ($\omega_i = 1.0$, all i). In this case, the pragmatic market socialist variant out-performs capitalism not only in terms of output (11.2 percent higher in t = 1), consumption equality (Gini coefficient of consumption 17.5 percent lower in t = 1), and social welfare (sum of utilities 1.8 percent higher in t = 1), but also in terms of private saving (3.5 percent higher in t = 1). As a result of the higher saving under socialism, after 25 periods capital stock is 2.1 percent higher under the socialist variant.

The second case assumes partial compensation, using the ω_i values shown above in Table 3.4, but without any social saving under socialism. In this case, socialism continues to out-perform capitalism in terms of output, consumption equality, and social welfare in t = 1, but private saving is 5.5 percent lower than private saving under capitalism in t = 1, and after 25 periods, capital stock is 1.9 percent lower under socialism than under capitalism. Thus the economy pays a price for the immediate gain of socialism in terms of a lower rate of capital accumulation.

As discussed in Chapter 2 above, it is an essential component of

TABLE 4.1 Aggregate Indicators for Various Benchmark Solutions

(percentage di	fferences in	parentheses	s)					
	Case	i	Case	eii	Case iii			
	cap	soc	cap	soc	cap	soc		
Output/Income	$e(Q = \Sigma y_i)$							
t = 1	.2167	.2410	.2167	.2385	.2167	.2394		
	(11.2)	(10.	1)	(10.	5)		
t = 25	.3144	.3491	.3144	.3435	.3144	.3462		
	(11.0))	(9.2	.)	(10.	1)		
Consumption	Gini (GC)							
t = 1	.2382	.1965	.2382	.2039	.2382	.2054		
	(–17.	5)	(-14	.4)	(-13	3.8)		
t = 25	.2176	.1994	.2176	.2057	.2176	.2071		
	(-8.4	4)	(-5.	.5)	(4	.8)		
Sum of Utilitie	Sum of Utilities ($SW = \Sigma u_i$)							
t = 1	2.8474	2.8978	2.8474	2.8998	2.8474	2.8947		
	(1.8)		(1.8))	(1.7))		
t = 25	3.1423	3.1806	3.1423	3.1761	3.1423	3.1750		
	(1.2)		(1.1))	(1.0))		
Private Saving	$(PS = \Sigma s_i)$							
t = 1	.0288	.0298	.0288	.0272	.0288	.0271		
	(3.5)		(-5.:	5)	(-5.	7)		
t = 25	.0456	.0479	.0456	.0444	.0456	.0444		
	(5.1)		(-2.1	7)	(-2.	6)		
Social Saving	(<i>SS</i>)							
t = 1	0	0	0	0	0	.0016		
	()		(—)	(—)		
t = 25	0	0	0	0	0	.0020		
	(—)		(—)	(—)		
Total Saving (2	TS = PS + S	SS)						
t = 1	.0288	.0298	.0288	.0272	.0288	.0287		
	(3.4)		(-5.	5)	(-0.1	2)		
t = 25	.0456	.0479	.0456	.0444	.0456	.0464		
	(5.1)		(-2.7	7)	(1.8)		
Next-Period C	apital (K)							
t = 1	1.0288	1.0298	1.0288	1.0272	1.0288	1.0287		
	(0.1)		(-0.2	2)	(0.	0)		
t = 25	1.9170	1.9575	1.9170	1.8810	1.9170	1.9261		
	(2.1)		(-1.9)	(0.5)		

Case i: full compensation, no social saving

Case ii: partial compensation, no social saving

Case iii: partial compensation, social saving

the pragmatic market socialist proposal that if socialization results in a decline in private saving, the differential would be covered by social saving out of tax revenue. The national government would appropriate out of tax revenue an amount to be allocated to business physical capital investment, and this amount would be distributed among business enterprises through the financial intermediary structure, consisting of presently existing intermediaries such as investment banks, and also possibly of additional special purpose intermediaries: the National Investment Banking System, and the National Entrepreneurial Investment Board.

This provision is reflected by an automatic adjustment mechanism in the computer program which finds solutions to the general equilibrium model under examination here. The capitalist and socialist variants of the model are solved for the first period. Then private saving under socialism is compared with private saving under capitalism. If private saving under socialism is less, the socialist variant of the model is re-solved with social saving *SS* set equal to the differential. Although private saving under socialism in the second solution is marginally less than that obtained in the first solution, total saving is then practically identical for the two variants of the model.

Once social saving has been set in the first period at a positive level, it increments in succeeding periods according to a mechanism similar to that used in specifying effective financial assets for the private household. For the private household, effective assets are end-ofperiod assets less the proportion χ of beginning-of-period assets: $a_i^e = a_i - \chi a_i^o$. The term χa_i^o may be interpreted as "required" or "basis" assets: only financial assets beyond this level contribute positively to the utility of the household. Since $\chi = 1.01$ for all solutions, this implies that households "require" or "expect" growth in assets of 1 percent per period. An analogous mechanism is used in the development of social saving over time, and the same parameter value is utilized. Thus SS increments by the factor $\chi = 1.01$ each period: $SS_{t+1} = \chi SS_t = 1.01 SS_t$.

The consequences of using social saving as a means of overcoming the private saving shortfall created by partial compensation is shown in the third case of the benchmark solution. Although there is still a very modest shortfall in terms of total saving in period t = 1, by period t = 25 the socialist economy has recovered in terms of capital, and capital stock is actually somewhat higher under socialism than under capitalism (0.5 percent). Meanwhile, the advantage of socialism over capitalism in terms of output, consumption equality, and social welfare, both in period 1 and period 25, is only slightly less than is the case in the full compensation solution (respectively, in period 1, 10.5 relative to 11.2 percent higher output, 13.8 relative to 17.5 percent lower consumption Gini, and 1.7 relative to 1.8 percent higher sum of utilities). The third benchmark solution is henceforth taken as standard: all solutions obtained in the sensitivity analyses reported below presume partial compensation using the Table 3.4 partial compensation ω_i figures, together with the specification of social saving, if necessary, as described above.

Before continuing on to Table 4.2, which shows the full solution over households of the third benchmark solution in Table 4.1, some additional comments on the implications of the results in Table 4.1 would be useful. If a social transition to pragmatic market socialism were ever to become a serious possibility, clearly resistance to the transition among wealthy capitalists would be moderated if the compensation plan envisioned full compensation in cash. It is also clear, looking at Table 4.1, that results forthcoming from the model under examination here support full compensation. According to the model, with full compensation under the benchmark parameter values a shortfall in private saving would not occur under pragmatic market socialism, thus evading the problems and complications of initiating a flow of social saving devoted to business sector capital accumulation. At the same time, partial compensation is superior to full compensation in period 1 social welfare terms only by a very tiny margin.

On the other hand, were a transition to pragmatic market socialism to become a serious possibility, this could only occur because a large proportion of the population had come to accept the proposition that property income is unearned. Acceptance of this proposition implies a rather massive amount of inequity throughout the history of modern capitalism in the form of extremely unequal distribution of unearned property return. Under the circumstances, it might not be regarded as morally legitimate to provide full compensation for very large capital fortunes, particularly those based on inheritances.

As for the results on private saving shown in Table 4.1, it is very important to recognize that they depend critically on three factors: the effective assets feature of the model, the numerical value used for χ , and, finally, the very high level of inequality in financial asset distribution under capitalism. Consider the household supply of saving equations for the capitalist and socialist variants of the model (non-BPO households in the case of socialism):

$$s_i = \varphi_3[c_m + (1 - \tau)\overline{r}e_i^{\gamma}a_i^{\rho} + (1 - \tau)w_i(1 - e_i)] - (\varphi_1 + \varphi_2)(1 - \chi)a_i^{\rho} \quad (C.11)$$

$$s_i = \varphi_3[c_m + d_m + (1 - \tau)w_i^*] - (\varphi_1 + \varphi_2)(1 - \chi)a_i^{\varphi}$$
(S.11)

Comparing the first term in the two equations, it is seen that the socialist household receives no property income on financial assets, thus this incentive to save (or, perhaps more accurately, this source of saving) is removed. However, under benchmark parameter values the socialist household receives a higher effective wage on labor $(w_i^* > w_i)$. As effective wage on labor positively affects household saving, a higher effective wage might offset the elimination of property income and result in higher private saving under socialism—as indeed occurs under the benchmark case with full compensation.

The second term is the same as between the two equations. This term involves the factor $1-\chi$. If this factor is not operative (by means of setting $\chi = 1$), this term disappears. It is this second term which is responsible for the lower private saving under socialism with partial compensation. Because of the fact that decile 1 has over 72 percent of financial assets while the partial compensation case envisions only about 61 percent compensation of decile 1 financial assets, the $(1-\chi)a_i^{Q}$ factor under socialism for decile 1 is very much smaller than the equivalent factor under capitalism, resulting in a substantial saving shortfall.

However, if the model is solved in period t = 1 with partial compensation and $\chi = 1$, private saving under socialism is in fact higher than private saving under capitalism, and there is thus no need for social saving. The specification of $\chi > 1$ and the consequent

ratchet effect in financial assets in the model therefore in fact addresses the need for conservatism: the avoidance of building assumptions into the model which would tend to favor the relative performance of pragmatic market socialism over that of capitalism. But it is certainly well within the realm of possibility that the model might actually be excessively conservative on this matter, so that if in fact socialization were to take place with partial compensation, there would not be any significant decline in private saving. Be that as it may, we will continue here to use the partial compensation/social saving assumption.

Table 4.2 displays a full solution of the general equilibrium model in period t = 1 for the benchmark parameter values, assuming partial compensation and positive social saving (Case iii). The upper part A of the table pertains to the capitalist variant of the model and the lower part B to the pragmatic market socialist variant. The output level Qis 10.5 percent higher under pragmatic market socialism than under capitalism (.2394 versus .2167). The Gini coefficient of consumption, an observable measure of inequality, is 13.8 percent lower under pragmatic market socialism than under capitalism (.2054 versus .2382). The Benthamite (or sum of utilities) measure of social welfare is 1.7 percent higher under pragmatic market socialism than under capitalism (2.8947 versus 2.8474). Clearly under the benchmark parameter values the pragmatic market socialist variant significantly out-performs the capitalist variant on the basis of all three aggregate welfare indicators.²⁶

More ordinary labor (l_i) is provided under pragmatic market socialism than under capitalism in every income bracket. This is only to a minor extent because non-BPO households under pragmatic market socialism are not "distracted" by capital management effort. The equilibrium amount of capital management effort even in the highest income decile under capitalism, the only decile in which property income may be described as substantial relative to labor income, is less than 1/100 of the labor provision in that decile. The main reason for the difference is rather that the social dividend wage and salary supplement under pragmatic market socialism constitutes an across-the-board increase in the effective wage of labor.

Returning to the model equations, equation C.3 for capitalism may

TABLE 4.2

Detailed Benchmark Solution with Partial Compensation and Social Saving (Table 4.1 Case iii, t = 1)

A. Capitalism ($\tau = .40$)

Q = .2167 $\overline{r} = 0.0464$ $c_m = 0.00867$

i	li	y_i^w	ei	p i	Уi	ti	Ci	Si	ui
1	.1600	.0368	.0013738	.0316283	.0685	0.0187	.0386	.0111	.34713
2	.1788	.0293	.0005505	.0090011	.0383	0.0066	.0268	.0048	.30993
3	.1858	.0260	.0001566	.0021916	.0282	0.0026	.0228	.0028	.29487
4	.1793	.0217	.0000363	.0004384	.0221	0.0002	.0198	.0021	.28580
5	.1703	.0184	.0000063	.0000677	.0185	-0.0013	.0179	.0018	.28044
6	.1533	.0141	.0000008	.0000073	.0141	-0.0030	.0156	.0016	.27397
7	.1422	.0119	.0000001	.0000005	.0119	-0.0039	.0144	.0014	.27077
8	.1022	.0065	.0000000	.0000000	.0065	-0.0061	.0114	.0011	.26320
9	.0834	.0048	.0000000	.0000000	.0048	-0.0068	.0105	.0010	.26110
10	.0723	.0039	.0000000	.0000000	.0039	-0.0071	.0100	.0010	.26016
То	tal		.0021243		.2167		.1879	.0288	2.84739
Gi	ni				.4425		.2382		.0469

B. Pragmatic Market Socialism ($\tau = .40$)

Q = .2394 $\bar{r} = 0.2884$ $c_m = 0.00942$ $\alpha = 0.05$ $\mu = 0.10$ v = 0.0 $d_m = 0.00000$ SS = 0.0016yi i li di ei Уi ti Ci Sį ui BPO: .0032854 .1331 0.0438 .0808 .0085 .48014 1 .2365 .0407 .0083914 .0491 0.0102 .0317 .0072 .30739 2 .2167 .0323 0.0062 .0282 .0046 .0066638 .0390 .30349 3 .2042 .0287 .0059233 .0347 0.0044 .0270 .0032 .30357 4 .1925 .0239 0.0021 .0242 .0025 .0049361 .0289 .29795 5 .1829 .0204 .0041957 .0245 0.0004 .0219 .0022 .29268 .1665 .0156 -0.0019 .0188 .0019 6 .0032085 .0188 .28492 7 .1557 .0132 -0.0031 .0172 .0017 .0027149 .0159 .28094 8 .1154 .0072 -0.0060 .0133 .0013 .0014808 .0087 .27115 9 .0955 .0053 .0010859 .0064 -0.0069 .0120 .0012 .26831 10 .0835 .0043 .0008885 .0052 -0.0073 .0114 .0011 .26703 Total .0003285 .2394 .2107 .0271 2.89472 Gini .3650 .2054 .0341

be compared to equation S.3 for pragmatic market socialism. Equation C.3 expresses the rate of return on household financial assets as a function of capital management effort. Under pragmatic market socialism property income on financial assets would not be available to the household. However, this liability of the system from the viewpoint of the household is balanced by the asset of a higher effective wage, because the household would be entitled to a social dividend supplement to its regular wage and salary income. Equation S.3 shows this higher effective wage (contrast S.1 = C.1 with S.3). Since the structure of the model contains an upward-sloping supply curve of labor (stemming from the Cobb-Douglas utility function in conjunction with each household receiving effective nonlabor income in the form of c_m), the higher effective wage elicits higher labor from all income deciles.

Table 4.3, which displays the three aggregate welfare measures (output Q, consumption Gini GC, and sum of utilities social welfare SW) as between the two model variants for a range of tax rates from $\tau = 0.00$ to $\tau = 0.75$, demonstrates that this qualitative result is independent of the tax rate. In a strict technical sense, the Table 4.3 results pertain to sensitivity analysis with respect to the tax rate rather than the benchmark solution because τ varies around the value shown in Table 3.4 above. However, in this context it is more logical to include these results as benchmark solutions. The τ parameter is more of a social choice variable rather than a pure exogenous parameter. The results in Table 4.3 should be thought of as a series of benchmark solutions of the model for varying tax rates.

A low tax rate indicates a situation of little social redistribution of market income; a high tax rate indicates a situation of much social redistribution of market income. The tax rate may be either low or high under either capitalism or pragmatic market socialism. Of course, one of the most widespread prejudicial misunderstandings of the concept of socialism is that of the "giant welfare state": according to this particular preconception, it is part of the essential nature of socialism to engage in substantially more income redistribution than capitalism. While it is true that the revisionist (or social democratic) concept of socialism does indeed emphasize redistribution in place of public ownership as a means of attaining social equity goals, the

TABLE 4.3Aggregate Indicators as a Function of the Tax Rate (t = 1)

Tax Rate	Output/Income		Consump	tion Gini	Sum of Utilities	
(τ)	(<i>Q</i> =	Σy_i)	(G	C)	(SW =	Σ u _i)
	cap	SOC	cap	SOC	cap	soc
00	2067	2015	1200	2587	2 7009	2 7505
.00	.2907	.3213	.4290	.5562	2.7008	2.1393
.05	.2809	.3120	.4030	.3393	2.7399	2.7932
.10	.2112	.3023	.3821	.3203	2.7715	2.8213
.15	.2675	.2925	.3585	.3013	2.7970	2.8444
.20	.2577	.2825	.3348	.2823	2.8169	2.8631
.25	.2477	.2722	.3110	.2632	2.8318	2.8775
.30	.2376	.2616	.2869	.2440	2.8419	2.8876
25	2222	2509	2627	2247	2 9471	2 0024
.55	.2215	.2308	.2027	.2247	2.0471	2.8934
.30	.2232	.2483	.2579	.2209	2.8475	2.8941
.37	.2231	.2463	.2529	.2170	2.8478	2.8945
.38	.2210	.2440	.2480	.2131	2.8479*	2.8947
.39	.2188	.2417	.2432	.2092	2.8477	2.8948*
40	2167	2394	2382	2054	2 8474	2 8947
41	2145	2371	2332	2015	2.0474	2.0747
.+1 12	2143	23/1	.2333	1035	2.0400	2.024
. - 2 12	2101	.2340	.2204	.1935	2.0400	2.0750
.+5	2070	.2324	.2234	.1975	2.0430	2.0931
.44	.2019	.2300	.2104	.109/	2.8438	2.8922
.45	.2057	.2270	.2134	.1838	2.8424	2.8911
.50	.1944	.2153	.1883	.1661	2.8319	2.8819
.55	.1826	.2023	.1625	.1461	2.8151	2.8666
.60	.1702	.1886	.1362	.1257	2.7910	2.8441
.65	.1572	.1740	.1090	.1049	2.7581	2.8128
.70	.1435	.1584	.0806	.0834	2.7148	2.7702
.75	.1289	.1416	.0504	.0608	2.6577	2.7132

* = maximum Sum of Utilities (Social Welfare)

pragmatic market socialist proposal with which we are concerned here adheres to the original (and still primary) definition of socialism as involving nothing more nor less than public ownership of the preponderance of nonhuman factors of production utilized in largescale production. Insofar as the proper level of social redistribution of market income is concerned, the pragmatic market socialist proposal, in and of itself, is entirely neutral. Therefore to compare capitalism and pragmatic market socialism fairly and meaningfully, we must compare the two systems at the same tax rate. This principle is embodied in and emphasized by the Table 4.3 results.

Figures 4.1 and 4.2 are derived from Table 4.3. Figure 4.1 is a graphical representation of the equity-efficiency tradeoff for the two systems. The degree of "equity" is indicated by a measure of consumption equality (EQ = 1 - consumption Gini). The degree of "efficiency" is indicated by the output level (Q).²⁷ As the tax rate is increased, reflecting more redistribution, the equity level is increased, but at the cost of reduced output. However, the EQ-Q curve is higher under pragmatic market socialism (the dashed line) than it is under capitalism (the solid line), enabling higher levels in both output and equality.

Since pragmatic market socialism out-performs capitalism in the benchmark solution both in terms of equity and efficiency, it is to be expected that it would also out-perform capitalism in a social welfare sense. This is verified by solution results of social welfare (in the Benthamite sum of utilities sense) as a function of the tax rate τ . Figure 4.2 shows that the social welfare curve (i.e., sum of utilities as a function of the tax rate) for pragmatic market socialism (the dashed line) is higher than the equivalent social welfare curve (the solid line) for capitalism. Both of the latter curves reach their highest points at a tax rate of approximately $\tau = 0.40$, which, perhaps significantly, is not too far removed from the aggregate average tax rate in the United States at the present time.²⁸

It need hardly be emphasized that these results are dramatically at odds with conventional opinions concerning the potential performance of socialist systems relative to the capitalist status quo. It is typically conceded that the greater equality of property income distribution implied by socialism would probably represent an equity



Figure 4.1

gain. But the proviso is almost invariably immediately attached that the *efficiency* of the socialist system would probably be so low that the overall effect on social welfare would be negative. Of course, this judgment may be partially dependent on the limited awareness among economists, to date, of the pragmatic market socialist alternative. It may also be based on the preconception that any socialist system would necessarily engage in an excessive amount of social redistribution of market income. Looking at Table 4.3 and Figure 4.2, we can see, for example, that if the pragmatic market socialist system set $\tau = 0.70$ while the capitalist system continued with $\tau = 0.40$, social welfare would be lower under pragmatic market socialism (2.7702 versus 2.8474). However, to presume that any socialist system must necessarily engage in excessive social redistribution of market income-so that this would necessarily be the case in a potential pragmatic market socialist system of the future-may simply be another instance of begging the question.

Returning to Table 4.2, we note some salient features of the two solutions. Under pragmatic market socialism, households receive no property income; however the direct offset to this loss is the gain of social dividend income. The column of p_i under capitalism is replaced by a column of d_i under pragmatic market socialism. Only in the wealthiest decile does the total income received under capitalism exceed the total income received under pragmatic market socialism. Similarly only in the wealthiest decile does the utility level of the household under capitalism exceed the utility level of the household under pragmatic market socialism. The implication of the modelassuming the benchmark parameter values are valid-is therefore that only the wealthiest decile of the U.S. population has a rational preference for capitalism over pragmatic market socialism. Either the model is wrong, or the benchmark parameter values are wrong, or the current preference of the substantial majority of the U.S. population for capitalism is misguided.²⁹

Although the general results obtained from the benchmark solution are evidently congenial to those whose judgment suggests to them that pragmatic market socialism represents an attractive alternative to contemporary capitalism, certain aspects of this solution are unsatisfactory on commonsensical grounds. As an example, both the assignment and the retention coefficients are too high. A decile of the U.S. workforce represents at least 10,000,000 households. The assignment coefficient indicated as "optimal" by the theoretical model mentioned in the previous chapter, given the production function parameter values, is about 0.1. Be that as it may, it would obviously be politically inconceivable to propose to set up a Bureau of Public Ownership staffed by 1,000,000 employees. To do so would be to vindicate the standard prediction of capitalist apologetics that socialism would inevitably produce a "giant bureaucracy" to strangle the economy. Of political necessity, therefore, the BPO would have to be a reasonably lean federal government agency. At the very outside it might be allowed a workforce, including agents, central office personnel, and clerical and support staff, of perhaps 100,000.

Similarly with respect to the retention coefficient, it would be politically impossible to allow this lean agency to take for itself a full 5 percent of property return, regardless of any indications from a theoretical model that this is the socially optimal course. In the author's prior writing on pragmatic market socialism, a BPO retention coefficient of 5 percent has frequently been cited. But this number has been used in the context of discussions which argue that the BPO could probably get the same job done as is done under capitalism by private capital owners at a very small fraction of the present cost. Five percent is a convenient focal number which most would agree is a "very small fraction." In all probability, the BPO would in practice be allowed to finance itself with well under 1 percent of property return. However, in the context of these prior discussions it might seem "utopian" to suggest that the BPO could do the same job as the private capital owners for under 1 percent of the cost. 30

In an effort to achieve a tentative reconciliation of the model results with reality, it might be suggested that under pragmatic market socialism, the corps of effective capital managers would not be confined to BPO personnel. Rather it might also include a large proportion of high level corporate managers, down to perhaps four or five levels under the corporation's chief executive. Already under capitalism the extraordinary compensation of these individuals generates suspicions that although their compensation is accounted labor income, it is more realistically viewed as being drawn from the pool of property return. If these and perhaps other types of professionals (for example, loan officers and investment analysts of institutional investors) are accounted as belonging to the corps of effective capital managers, and their incomes are viewed as part of the effective capital management retention coefficient, the gap between the model results and apparent reality would be somewhat reduced.

Another point worthy of comment is the excessively comfortable position of the BPO households indicated by the benchmark model solution. Under capitalism, the highest decile households have a capital management effort (ei) output of .0013738, minimal compared to their ordinary labor (l_i) output of .1600. Under pragmatic market socialism, the typical BPO household has a capital management effort output of .0032854, well over twice that of the typical highest decile capitalist household. (Note, however, that the total capital management effort under pragmatic market socialism is actually less than it is under capitalism: in the socialist variant of the model the typical BPO household effort is multiplied by the factor μ = .1 to account for the fact that only the "BPO assignment" proportion of .1 of the highest decile households are employed by the BPO.) But under pragmatic market socialism the BPO household provides no ordinary labor. The minimal effort output of the BPO household in conjunction with a very large income (about twice that of the representative highest decile household under capitalism) means that the BPO household enjoys a high utility level of .48014, compared to a highest decile non-BPO household utility level under pragmatic market socialism of only .30739, and to a highest decile household utility level under capitalism of only .34713.

Those skeptical of socialism might be inclined to righteous indignation at the thought of "overpaid government bureaucrats" relaxing behind closed doors at the taxpayers' substantial expense. Of course, if the model is to be taken seriously, perhaps some indignation is also merited by the thought that under capitalism the highest decile households receive almost as much capital property income for the expenditure of .0013738 of their time on capital management effort ($p_i = .0316283$) as they do labor income for the expenditure of .1600 of their time on ordinary labor ($y_i^w = .0368$). Relative to the disutility of ordinary labor, the disutility of capital management effort under capitalism appears to be vestigial. Rather than becoming entangled in ideologically charged disputations over wherein lies the more legitimate cause for indignation, it is surely more convenient to dismiss this result as a mere technical anomaly.

In practice, of course, BPO personnel would spend long and busy days at their offices, thus establishing a commonsense claim to their remuneration, regardless of how minuscule and insignificant this activity might be interpreted by a theoretical economic model. In addition, retention coefficients and capital responsibilities of BPO agents would no doubt in practice be calibrated so that at a good rate of return on a given capital responsibility, the typical agent would be receiving very substantial—but far from astronomical—remuneration. Clearly, political necessity would require that BPO agents and other BPO personnel under pragmatic market socialism could not become nearly as prosperous as the wealthiest capitalists of the real-world capitalist system today.

No doubt additional problems and anomalies could be found in the benchmark solution for the capitalist and pragmatic market socialist variants of the general equilibrium model under consideration here. Such problems and anomalies are inevitable because the model—as is any such economic model—is merely an approximation to reality. Nevertheless, the results obtained constitute significant evidence in favor of the viability and desirability of the pragmatic market socialist alternative to the capitalistic status quo. Under the benchmark parameter values, the pragmatic market socialist economy has higher total output than the capitalist economy, lower consumption inequality, and higher social welfare in the sum of utilities sense. Moreover, with social saving in place, these static advantages are not offset by a lower rate of capital accumulation and economic growth.

The question then becomes whether or not the results obtained are fragile with respect to changes in the parameter values. Perhaps with only slightly different parameter values, the preferability of the pragmatic market socialist economy might be reduced or even eliminated. It is to this question that we now turn.

B. Sensitivity Analysis

Even though the model investigated here is very small and simple as general equilibrium models go, there are still large numbers of combinations of parameter values that might be utilized in sensitivity analyses. Obviously it is necessary to focus on a very small subset of these possibilities. The parameters of the utility function (ψ_2 and ψ_3) are selected because of their inherently speculative nature. The same is true of the distribution of financial assets and the level of compensation (GA and CC). Also examined will be variation in the flat-rate social dividend distribution parameter v. Finally, the elasticity of capital management effort parameter (γ) is selected because it is fundamental to the question of the potential relative performance of a pragmatic market socialist economy. As the γ parameter—but none of the other parameters enumerated above—-is found to have a profound effect on the qualitative implications of this research, it will be considered first.

The elasticity of capital management effort (γ) is the key parameter in the rate of return on capital function:

$$r_i = \overline{r} e_i^{\gamma} \tag{C.3}$$

The other parameter is \overline{r} , the limit return, interpreted as the maximum rate of return achievable on capital if the household devotes all of its available time to capital management effort ($e_i = 1.0$). Figure 4.3 (page 98 below) presents a graph of this function for $\overline{r} = 0.05$ and γ equal to respectively 0.20, 0.10, and 0.01. Notice how the function approaches the "plateau" configuration as the value of γ becomes very small.

The "plateau" configuration is defined as a configuration in which the rate of return on capital closely approaches its asymptotic upper limit (in this case, 0.05) very quickly, i.e., with a very small input of capital management effort. With a very low γ value, the disutility involved in providing the capital management effort necessary to achieve very close to the maximum possible amount of financial return on financial capital would be minimal. In both an economic and an ethical sense, it could then be said that capital property return is mostly unearned by its recipients: that this return consists mostly of producer's surplus (the amount by which the utility purchasable with the income exceeds the disutility incurred in earning it). It could also be said that capital property income is analogous to rental income in the Ricardian theory of differential rent. In that theory, the rental income received by the landowner is in no way attributable to the landowner's personal effort or productivity. It is rather generated entirely by the productivity of the land itself, and the landowner is able to appropriate this return owing to a competitive bidding process among prospective farmers (without land of their own) for the right to farm the land.

Thus the value of γ determines the extent to which capital property income may legitimately be interpreted as an earned return to capital management effort. The higher is γ , the more truth there is in the proposition that capital property return is an earned return; the lower is γ , the less truth there is in it. At the same time, it is intuitively evident that to the extent that capital property income *is* in fact an earned return to capital management effort, then the pragmatic market socialist economic system would tend to be inferior to capitalism. But to the extent that capital property income *is not* in fact an earned return to capital management effort, then the pragmatic market socialist economic system would tend to be superior to capitalism. This intuition is in fact confirmed by numerical experiment.

Table 4.4 shows the three key aggregate welfare indicators ($Q = \Sigma y_i$, GC, and $SW = \Sigma u_i$) for capitalism and pragmatic market socialism, as functions of the numerical value of the γ parameter from 0.01 to 0.20, given the benchmark values for the other parameters listed in Table 3.4 above, for the Case iii situation of partial compensation (CC < 1) and positive social saving (SS > 0). The consumption Gini coefficient for pragmatic market socialism remains below that for capitalism throughout all values of γ , but output for pragmatic market socialism drops below that for capitalism at $\gamma = 0.07$. The Benthamite social welfare criterion for pragmatic market socialism drops below that for capitalism at a lower γ value of 0.04. Aggregate indicators are also shown in the table for $\gamma = 0.035$ to 0.045 by increments of 0.001. The "crossover point" in terms of social welfare occurs at $\gamma = 0.040$, to within three decimal places of accuracy.

A graph of social welfare as a function of γ for the two models (Figure 4.4) shows the dashed line for pragmatic market socialism

Cap Man	Output/Income		Consump	otion Gini	Sum of Utilities	
Elasticity	(Q =	$= \Sigma y_i$	(G	C)	(<i>SW</i> =	Σ <i>u</i> _i)
(γ)	cap	soc	cap	SOC	cap	soc
.01	.2167	.2394	.2382	.2054	2.8474	2.8947
.02	.2069	.2247	.2390	.2049	2.8100	2.8411
.03	.1985	.2121	.2458	.2044	2.7771	2.7924
.035	.1947	.2063	.2353	.2042	2.7617	2.7693
.036	.1940	.2051	.2352	.2041	2.7587	2.7647
.037	.1933	.2040	.2351	.2041	2.7558	2.7603
.038	.1926	.2029	.2449	.2040	2.7529	2.7558
.039	.1919	.2018	.2348	.2040	2.7499	2.7513
.040*	.1912	.2008	.2348	.2040	2.7470	2.7469
.041	.1905	.1997	.2347	.2039	2.7441	2.7425
.042	.1898	.1986	.2345	.2039	2.7413	2.7381
.043	.1891	.1976	.2344	.2038	2.7385	2.7338
.044	.1884	.1965	.2343	.2038	2.7356	2.7295
.045	.1878	.1955	.2341	.2037	2.7329	2.7251
.05	.1846	.1905	.2337	.2035	2.7192	2.7040
.06	.1785	.1812	.2327	.2031	2.6931	2.6630
.07**	.1730	.1726	.2315	.2026	2.6685	2.6239
.08	.1678	.1647	.2305	.2021	2.6452	2.5861
.09	.1630	.1573	.2296	.2016	2.6229	2.5497
.10	.1586	.1505	.2285	.2011	2.6016	2.5145
.11	.1544	.1441	.2276	.2005	2.5812	2.4802
.12	.1504	.1380	.2267	.2000	2.5616	2.4470
.13	.1467	.1324	.2256	.1994	2.5428	2.4147
.14	.1432	.1271	.2247	.1988	2.5245	2.3832
.15	.1339	.1221	.2238	.1982	2.5069	2.3525
.16	.1367	.1174	.2227	.1975	2.4899	2.3224
.17	.1337	.1129	.2219	.1967	2.4734	2.2930
.18	.1309	.1087	.2208	.1962	2.4575	2.2644
.19	.1282	.1047	.2199	.1955	2.4420	2.2362
.20	.1256	.1009	.2190	.1947	2.4269	2.2087

TABLE 4.4 Aggregate Indicators as a Function of the Elasticity of Capital Management Effort (t = 1)

* Social Welfare Crossover Point

** Output Crossover Point

falling below the the solid line for capitalism at approximately $\gamma = 0.040$. The model indication is therefore that pragmatic market socialism out-performs capitalism for capital management elasticity of output lower than 0.040, and that capitalism out-performs pragmatic market socialism for capital management elasticity of output of 0.040 and beyond. At the extremes of the γ range, pragmatic market socialism is estimated to possess a 1.7 percent social welfare advantage over capitalism for $\gamma = 0.01$ (the benchmark γ value), and capitalism is estimated to possess a 9.87 percent social welfare advantage over pragmatic market socialism for $\gamma = 0.20$ (the "extreme pro-capitalist" value).

While evidence from the 1971 Purdue University Individual Investor Survey was presented above in Chapter 3, Section B, in support of the benchmark γ value of 0.01, it can hardly be alleged that this evidence is compelling. To begin with, the potential shortcomings of econometric analysis of unverified survey responses are numerous, serious, and widely appreciated. And then there are questions to be raised about using stock market activists as proxies for potential BPO personnel, since the efforts of the former under contemporary capitalism are more realistically classed as investment analysis, while the efforts of the latter under pragmatic market socialism would be more realistically classed as corporate supervision. For these and other reasons, the true value of γ cannot be specified as 0.01 with any degree of confidence. As a result, it cannot be confidently asserted that the pragmatic market socialist economic system would surpass the performance of the capitalist economic system. Within the context of this model, the relative performance of the two systems depends on a parameter whose true value is, at this point in time, much more the implicit subject of ideological controversy than the explicit subject of scientific inquiry.

Tables 4.5 and 4.6 present matrices of the percentage differences in the three key aggregate welfare indicators ($Q = \Sigma y_i$ = output/income, GC = consumption Gini coefficient, and $SW = \Sigma u_i$ = Benthamite sum of utilities social welfare) as between pragmatic market socialism and capitalism, for the benchmark $\gamma = 0.01$ value, for combinations of utility function parameters (Table 4.5), and for combinations of financial asset inequality (GA) and compensation



Figure 4.3 Rate of Return Functions

TABLE 4.5

Percentage Differences in Aggregate Indicators between Socialism and Capitalism as a Function of Combinations of Utility Function Parameters (t = 1)

		$\psi_2 = 2.0$	$\psi_2 = 2.5$	$\psi_2 = 3.0$	$\psi_2 = 3.5$	$\psi_2 = 4.0$
	Q	9.9	10.5	10.9	11.2	11.5
$\hat{\psi}_3 = .05$	GC	-14.4	-13.8	-13.2	-12.6	-12.0
	SW	1.9	1.7	1.5	1.3	1.2
	Q	9.5	10.1	10.5	10.8	10.5
$\psi_3 = .10$	GC	-14.9	-14.4	-13.8	-13.2	-13.8
	SW	2.0	1.8	1.7	1.5	1.3
	Q	9.1	9.7	10.1	10.4	10.7
$\psi_3 = .15$	GC	-15.3	-14.8	-14.3	-13.8	-13.3
	SW	2.2	2.0	1.8	1.6	1.5
	Q	9.0	9.6	9.9	10.2	10.3
$\psi_3 = .20$	GC	-15.4	-15.0	-14.6	-14.2	-13.8
1.5	SW	2.3	2.1	1.9	1.8	1.6
	Q	8.9	9.5	9.9	10.1	10.3
$\psi_3 = .25$	GC	-15.5	-15.1	-14.7	-14.3	-14.0
•	SW	2.3	2.1	2.0	1.8	1.7

TABLE 4.6

Percentage Differences in Aggregate Indicators between Socialism and Capitalism as a Function of Combinations of Capital Asset Inequality and Compensation (t = 1)

		CC=1.0	CC=.95	CC=.90	CC=.85	CC=.80
	Q	11.2	10.8	10.5	10.3	10.2
GA = .90	GC	-18.9	-17.7	-14.7	-12.6	-11.2
	SW	1.9	1.9	1.8	1.6	1.6
	Q	11.2	10.9	10.5	10.3	10.2
GA = .80	GC	-15.8	-14.9	-12.6	-10.7	-9.2
	SW	1.6	1.6	1.6	1.5	1.4
	Q	11.0	10.8	10.3	10.2	10.1
GA = .70	GC	-11.7	-11.0	-9.3	-7.6	-6.3
	SW	1.4	1.4	1.4	1.3	1.2
	Q	10.8	10.6	10.1	10.0	9.9
GA = .60	GC	-7.0	-6.5	-5.2	-3.8	-2.5
	SW	1.1	1.1	1.1	1.1	1.0
	Q	10.4	10.3	9.9	9.7	9.7
GA = .50	GC	-1.9	-1.4	-0.4	0.8	1.8
	SW	0.8	0.8	0.8	0.8	0.8

coefficients (CC) (Table 4.6). In almost every cell of both matrices, Q is higher under pragmatic market socialism, GC is lower under pragmatic market socialism, and SW is higher under pragmatic market socialism. The only exception is that the combination of greatly reduced inequality in financial asset ownership (GA = .50) in combination with significantly reduced compensation (CC = .85) could yield higher consumption inequality under pragmatic market socialism. But on the whole, inspection of Tables 4.5 and 4.6 suggests that variation in these parameters is not likely to negate the qualitative advantage of pragmatic market socialism over capitalism, as perceived by the general equilibrium model under consideration here.

Table 4.5 addresses the inherent uncertainty regarding the parameters of the utility function. Although the benchmark values of the utility function parameters are roughly calibrated to produce reasonably realistic solution values in labor and saving, they have no additional support from statistical or econometric evidence. Utility being unmeasurable, economic science has not developed any means of directly estimating utility functions. But for purposes of the qualitative conclusions to be drawn from the present research, the utility function parameter values have no significant effect. In fact, it is even rather remarkable that such wide variations in utility function parameter values have such a small impact on the relative performance indicators as between capitalism and pragmatic market socialism.

The results in Table 4.6, which include downward variation in capital wealth inequality, are an effort to address the "people's capitalism" strand of capitalist apologetics. People's capitalism is the proposition that when properly interpreted (for example, in expected lifetime terms rather than current terms), capital wealth and capital property income are not as unequally distributed as many people believe. The level of financial asset inequality utilized in the benchmark solution of the model is in fact based not on hypothesis or speculation, but rather on hard empirical data from the 1966 Federal Reserve Board *Survey of Financial Characteristics of Consumers*. Moreover, Table 4.6 demonstrates that there is no real refuge to be found from the indications of this research in the hypothetical speculation that in actual fact capital wealth inequality is significantly

less than that used in the benchmark solution. The Table 4.6 results show that the relative advantages of pragmatic market socialism over capitalism in terms of output, consumption equality, and social welfare tend to decline somewhat both as capital wealth inequality declines, and as compensation declines. But these advantages persist and remain significant (except for the consumption equality indicator) even when both capital wealth inequality and compensation are set at what are almost certainly unrealistically low levels.

Finally, we turn to sensitivity analysis with respect to the flat-rate social dividend distribution parameter v under pragmatic market socialism. The benchmark solution is based on v = 0.0, indicating that the entire social dividend fund would be distributed as a proportional supplement to earned wage and salary income (labor income). Potential objections to this disposition of the social dividend fund might come from two rather disparate directions. First, "traditional" socialists might object to using the social dividend to reinforce existing inequality in labor income. Second, theoretical economists might object to the efficiency distortions arising from "subsidizing labor."

With respect to the first objection, there are two central responses. First, the fact is that one of the most politically effective misrepresentations of socialism within capitalist apologetics is the allegation that socialism would inevitably produce a "giant welfare state" in which redistribution of market income would be pushed to ridiculous and very costly extremes. Consequently, the distribution of social dividend income primarily or solely on the basis of earned labor income would constitute an effective response to this particular misrepresentation. Second, excessive income inequality under pragmatic market socialism could be handled in the same way that it is under capitalism: by redistribution through the tax and welfare system. Social dividend income under pragmatic market socialism, as one of the two basic components of total income (the other being direct labor income), would be subject to taxation (in the model under consideration, at the rate of τ). Those who feel that total income distribution is excessively unequal under pragmatic market socialism would be free to work, through the democratic system, toward more social redistribution (in terms of the model, toward a higher τ and a higher c_m). However, those who feel this way should try to remain aware of the fact, illustrated above by Table 4.3 and Figure 4.2, that it is clearly possible to push redistribution to a socially harmful extreme.

With respect to the second objection, again there are two central responses. The first is that distribution of social dividend in proportion to labor income under pragmatic market socialism would provide a partial offset to an existing distortion of major proportions: that of the tax and welfare system through which social redistribution of market income is pursued. The second is that in any event, this whole issue constitutes nothing more than a "technical quibble" against pragmatic market socialism. The reason is that the Pareto criterion of efficiency which underlies the issue is clearly unviable as a guide to social policy (except to the most extreme political conservatives), and in practice some type of social welfare evaluation, such as the Benthamite sum of utilities function utilized herein, must necessarily be applied. Table 4.7 is provided to elucidate these points.

Table 4.7 shows labor supply by decile household, total labor supply, and sum of utilities social welfare, for five different solutions of the model using the Table 3.4 benchmark values of the other parameters. Two solutions are obtained for the capitalist variant: one for $\tau = 0.00$ (no redistribution of market income at all), and the other for $\tau = 0.40$ (approximately the existing level of redistribution under contemporary United States capitalism). The first solution may be regarded as Pareto efficient in a labor provision sense because income taxation does not drive the proverbial "wedge" between the marginal disutility of labor to each household and the marginal productivity of labor to each firm (in this case, since there is just one aggregated output good, there is just one "firm"). The second solution for the capitalist variant is for $\tau = 0.40$: this is the benchmark solution shown in full in Table 4.2 above. Note that labor is substantially lower in all deciles. The lower labor comes about for two reasons: (1) the imposition of a tax rate τ on income lowers the effective wage of labor and lowers the position of each household on its upward-sloping supply curve of labor; (2) the provision of a flat-rate subsidy c_m to each household reduces its supply of labor. In the case of the low-income deciles, the very substantial reduction of labor between the no-
TABLE 4.7 Comparison of Household Labor Supply-Various Cases **Relative to Hypothetical Pareto Optima**

capitalism			pragmatic market socialism		
house- hold	$\tau = 0.00*$	$\tau = 0.40$	$\tau = 0.00*$ $\nu = 0.00$	$\tau = 0.40$ $\nu = 0.00$	$\tau = 0.40$ v = 0.50
1	0 1760	0 1600	0.2812	0 2365	0 2221
2	0.1700	0.1000	0.2812	0.2303	0.2231
3	0.2552	0.1858	0.2730	0.2042	0.2007
4	0.2650	0.1793	0.2695	0.1925	0.1743
5	0.2677	0.1703	0.2692	0.1829	0.1636
6	0.2682	0.1533	0.2694	0.1665	0.1460
7	0.2683	0.1422	0.2696	0.1557	0.1348
8	0.2683	0.1022	0.2706	0.1154	0.0953
9	0.2683	0.0834	0.2715	0.0955	0.0772
10	0.2683	0.0723	0.2722	0.0835	0.0666
Total	2.5311	1.4276	2.7200	1.6494	1.4688
SW	2.70083	2.84739**	2.75947	2.89472**	2.88423

* Pareto Optimum** Benthamite Social Welfare Optimum

redistribution solution and the redistribution solution is mostly owing to the latter reason.

Before turning to the socialist solutions, note that the sum of utilities social welfare indicator is substantially higher for the capitalist solution with redistribution than it is for the capitalist solution with no redistribution (2.84739 versus 2.70083). Clearly, the Pareto inefficient solution is socially preferable to the Pareto efficient solution. We will return to this point shortly.

Three solutions are reported for the socialist variant of the model: the first two are equivalent to the two capitalist solutions. There is a no-redistribution solution ($\tau = 0.00$) and a redistribution solution ($\tau = 0.40$) for a level of redistribution equal to that under capitalism (i.e., the benchmark socialist solution shown in Table 4.2 above). The same points hold as hold with respect to the analogous capitalist solutions: the first solution may be regarded as Pareto efficient because of the absence of wedges introduced by taxation between the marginal disutility of labor and the marginal productivity of labor; the second solution is preferable in a social welfare sense by a substantial margin. These first two socialist solutions are for a v value of 0.00, the benchmark value in which all social dividend is distributed in proportion to earned labor income.

The third socialist solution is for a v value of 0.50, indicating one half of the social dividend distributed in proportion to earned labor income, and one half in the same flat-rate subsidy paid to each household regardless of its earned labor income. The third socialist solution is inferior to the second solution in two respects. First, it shows even less labor (for each household and in total) than does the first solution, thus manifesting even more downward distortion of labor and even less Pareto efficiency than the second solution. Therefore, in this sense, social dividend distribution entirely in proportion to labor income may be viewed as a partial offset to the substantial distortions in labor supply introduced by the tax and welfare system. The tax and welfare system pushes labor way down-social dividend distribution in proportion to labor income restores labor at least to some slight extent. Thus the economic theoretician should have no qualms about this principle of social dividend distribution generating "too much labor" under pragmatic market socialism. According to the familiar logic of the "second best," the third socialist solution is inferior to the second socialist solution. Second, the third socialist solution shows a lower social welfare indicator than the second solution (2.88423 versus 2.89472). This—as argued below—is a far more sensible reason for preferring socialist solution 2 ($\nu = 0.00$) to socialist solution 3 ($\nu = 0.50$).

An individual who is absolutely determined-regardless of the sensibility of the matter-to argue that there would be "too much labor" under pragmatic market socialism, might make reference to the following indication from Table 4.7: the labor supply of the first decile household under pragmatic market socialism with $\tau = 0.40$ and v = 0.50 (.2365) is higher than the labor supply of the first decile household under capitalism with $\tau = 0.00$ (.1760). Aside from the fact that the labor of the other nine decile households under pragmatic market socialism would be less, not greater, than the labor of the analogous decile households under capitalism, and aside from the fact that the low labor provision of the first decile capitalist household is clearly an indirect result of its very large financial wealth rather than any distortions introduced by social redistribution policy, this argument runs into the following serious question: On what basis is it posited that the appropriate Pareto efficient solution for comparison is that for the capitalist economy with $\tau = 0.00$ and not that for the pragmatic market socialist economy with $\tau = 0.00$? The pragmatic market socialist solution with $\tau = 0.00$ is just as free of "distortions" introduced by the tax and welfare system as is the capitalist solution with $\tau = 0.00$. Both of these solutions are equally Pareto efficient, and the Pareto criterion provides absolutely no way of judging between them.

This is another example of a principle recognized and acknowledged by most serious practitioners of economic policy analysis: the principle that the Pareto criterion is in fact virtually useless as a guide to real-world social policy issues. The Pareto efficiency conditions in production and consumption are helpful in economic pedagogy for purposes of illustrating the economic mode of thought, and under some circumstances and in some contexts, they might even be rough and partial indicators of real-world relative efficiency as between firms, industries, or nations. But with respect to the important social policy issues, the Pareto welfare criterion has no significant bearing whatever—except possibly as a specious, pseudo-scientific rationalization for extreme political conservatism.

One problem is that reasonable specifications of Pareto efficiency conditions could hold under widely variant institutional circumstances: as for example in the case of both the capitalist and the socialist variant of the general equilibrium model studied here-under the assumption of no taxation and no redistribution under either variant $(\tau = 0.00)$. An even more serious problem with the Pareto criterion is that with respect to almost any conceivable social policy issue, any particular policy will generate some winners and some losers. The fundamental notion of Pareto optimality is that no change or alteration may be regarded as progress toward the optimum unless it increases the welfare of at least some individuals in society without reducing the welfare of any other individuals in society. Strict implementation of this criterion would demand that no change or alteration be undertaken unless it were approved unanimously by all members of society. This, of course, would result in social policy paralysis.

Any proposed implementation of the Pareto criterion of welfare economics as a standard for social policy evaluation is not only unviable, but ridiculous and absurd as well. Each one of the myriad social policy choices of the past which have resulted in the present legal and institutional circumstances of contemporary civilization must have operated to the disadvantage of at least a few individuals. Are we to undo the entire legal-institutional superstructure of society until we have arrived at the state of near-anarchy of primitive human society-in order that we should not continue to violate the Pareto principle of optimality? In actual fact, hardly anyone (aside from lunatic fringe libertarians) proposes any such thing. However, it is far from unknown for Pareto's concepts to be enlisted in the cause of political conservatism—implicitly taking the existent status quo as the appropriate starting point from which any proposed changes be judged. Whenever it is pointed out-whether by an economic theoretician or anyone else-that such-and-such a proposed policy would operate to the disadvantage of at least some individuals in society, and that any judgment that the policy is nevertheless desirable

requires "unscientific" interpersonal comparisons of utility—this constitutes the enlistment of pseudo-science in the interest of political conservatism.

In practice, any sensible judgment on any realistic social issue (for example, on what if any degree of social redistribution of market income is desirable, or on whether society should remain with the capitalist economy of today or perhaps institute a pragmatic market socialist economy) must necessarily be based on some aggregate social welfare criterion (such as the Benthamite sum of utilities criterion) which does in fact involve interpersonal comparisons of utility. There is no realistic alternative to this-least of all the Pareto alternative. Therefore, in considering the five solution results shown in Table 4.7, the dominant criterion can only be the "bottom line" criterion (both figuratively, and, in the case of this table, literally): social welfare (SW). Of the five solutions, the highest SW value (2.89472) occurs for the pragmatic market socialist solution with $\tau =$ 0.40 and v = 0.00. The indication of the table is that pragmatic market socialism-under the benchmark parameter values-would be superior to capitalism on social welfare grounds, and also that pragmatic market socialism with social dividend distributed entirely on the basis of labor income (v = 0.00) would be superior to social dividend distributed partially as a flat-rate subsidy (v = 0.50).

Summarizing the implications of the sensitivity analysis reported above, there are two primary points to be emphasized. On the whole, the qualitative indication of the preferability of pragmatic market socialism over capitalism is demonstrated to be quite robust. This preferability holds in terms of output, consumption equality, and social welfare, and it is not affected by substantial variations in almost all of the parameters of the model. However, there is a single critical exception to this finding: the elasticity of capital management effort (γ). Table 4.4 and Figure 4.4 demonstrate that if the elasticitity of capital management effort—a parameter which bears directly on the fundamental question of whether or not capital property income may be legitimately interpreted as an earned return to capital management effort—rises substantially above its benchmark value of 0.01, i.e., to the level of 0.04 or beyond, then pragmatic market socialism is indicated to be inferior to capitalism on sensible social welfare grounds. It would appear, therefore, that on the numerical value of this one key parameter hinges the fundamental question: Would or would not pragmatic market socialism be a superior economic system to contemporary real-world capitalism?

Summary and Conclusion

This study has developed a general equilibrium model for the purpose of comparing the economic performance of the contemporary capitalist system with that of a potential pragmatic market socialist alternative. Designed with a highly efficient, modern industrial economy such as that of the United States in mind, the pragmatic market socialist economy is intended to work "almost exactly" like the contemporary capitalist economy, except for two key differences: the Bureau of Public Ownership (BPO), and social dividend distribution of capital property return. Wheras under capitalism, corporation executives are responsible to boards of directors representing private owners, under pragmatic market socialism, corporation executives (of large, established, publicly owned corporations) would be responsible to BPO agents representing the entire working population of "citizen owners." Wheras under capitalism, capital property return is distributed to private capital owners on the basis of their financial capital wealth, under pragmatic market socialism, capital property return (produced by large, established, publicly owned corporations) would be distributed to the working population on the basis of their labor income.

Two variants of a general equilibrium model were developed to represent capitalism and pragmatic market socialism. The basic model incorporates, among other things: a Cobb-Douglas production function in aggregate physical capital, aggregate capital management effort, and household ordinary labor; a Cobb-Douglas utility function in consumption, leisure, and effective assets; marginal product pricing of household labor; and redistribution by the government through a linear net burden function using a constant tax rate parameter (τ). Under capitalism, the typical household provides both ordinary labor and capital management effort, and receives both labor income and property income. Under pragmatic market socialism, the typical non-BPO household specializes in ordinary labor provision, and receives both labor income and social dividend income, the latter of which constitutes a higher effective wage than that received under capitalism. Capital management effort is provided by the Bureau of Public Ownership. Higher government authority would set two key BPO parameters: the assignment coefficient (μ) is the proportion of highest income decile households the BPO would be permitted to hire as personnel; and the retention coefficient (α) is the proportion of total capital property return which the BPO would be allowed to retain for the compensation of its personnel and other expenses.

Under the principal benchmark set of parameter values and assumptions (in particular, that social saving would be undertaken under pragmatic market socialism to compensate for the reduction in private household saving), the pragmatic market socialist economy surpasses the performance of the capitalist economy on grounds of both equity and efficiency (Table 4.1, Case iii; Table 4.2). The equity gain is reflected by a 13.8 percent reduction in the Gini coefficient of consumption, an observable measure of inequality. The efficiency gain is reflected by a 10.5 percent increase in aggregate output. Although conventional opinion would find nothing out of the ordinary in an equity gain under socialism, an efficiency gain as well is quite a different matter. The efficiency gain stems from higher across-the-board labor owing to the higher effective wage under pragmatic market socialism implied by the social dividend principle of property return distribution. As a result of the combined gain in efficiency and equity, the pragmatic market socialist economy displays 1.7 percent more social welfare (using the Benthamite sum-ofutilities social welfare indicator) than the corresponding capitalist economy.

Furthermore, from the period 25 results in Table 4.1, it appears that the superior performance of the pragmatic market socialist economy would persist over a long period of time. And from the results shown in Table 4.3 and illustrated in Figures 4.1 and 4.2, the superiority of the pragmatic market socialist economy is independent of variations in the level of redistribution as reflected by the tax rate parameter. As a result, the downward-sloping equity-efficiency tradeoff showing the attainable combinations of output and equality would be higher under pragmatic market socialism than it is under capitalism (Figure 4.1). And the dome-shaped social welfare function showing Benthamite social welfare as a function of the value of the tax rate parameter would be higher under pragmatic market socialism than it is under capitalism (Figure 4.2).

It is demonstrated by the sensitivity analysis reported in Table 4.4 and illustrated by Figure 4.4 that the qualitative result that pragmatic market socialism would out-perform capitalism depends critically on the numerical value of the elasticity of output with respect to capital management effort (γ). This parameter governs the rate of return function which translates the level of capital management effort into a rate of return on managed capital. If the parameter has a very low value, then the rate of return function approaches the "plateau" configuration in which a very small amount of capital management effort, involving a minimal amount of disutility, achieves very close to the maximum attainable rate of return. In the benchmark case for which pragmatic market socialism out-performs capitalism, the value of γ is 0.01, which is in fact a very low value. This numerical value of γ is based indirectly on empirical data from the 1971 Purdue University Survey of the Individual Investor, but obviously this is a somewhat tenuous empirical base. Thus sensitivity analysis with respect to this parameter is required.

The sensitivity analysis demonstrates that if γ is substantially above 0.010—in particular, if it is greater than or equal to 0.040—then capitalism does indeed out-perform the pragmatic market socialist economy in a social welfare sense. This result is consistent with our intuitive appreciation of the matter, since a low γ value produces the plateau rate of return function for capital management effort, which in turn implies the mostly unearned nature of capital property income. Thus it is not necessary for those who might find the benchmark results from this research inconsistent with their prior judgments, and who at the same time are unwilling to re-examine these judgments seriously, to search for flaws in the model as a representation of reality. It is simply necessary to reject the benchmark numerical γ value of 0.01.

It would be disingenuous for the author to state or imply that he

possesses no prior judgment in favor of pragmatic market socialism. This judgment is always implicit and frequently explicit in a considerable body of published writing on the subject. Whers the majority of economists today express their prior judgment in favor of capitalism by declining to address questions which possess direct and significant implications concerning the legitimacy of capitalism, I have consistently expressed the dissenting judgment by continuing to study and write about a potential pragmatic market socialist alternative to contemporary capitalism.

But because I consider myself a social scientist rather than an ideologue, my writing deals as carefully and as objectively as possible, given my fundamental judgment on the matter, with the various objections that might be raised against the pragmatic market socialist plan. The intent of my work in this area has never been to "prove" the efficacy of pragmatic market socialism. Neither the scientific proof of this proposition, nor the scientific proof of its converse, is likely to be attained within the next several generations of humanity. My consistent contention has merely been that there is nothing in the corpus of generally accepted economic principles of the present day which constitutes compelling evidence against pragmatic market socialism and in favor of contemporary capitalism.

The model studied in this research, for example, incorporates a large quantity of generally accepted economic principles of the present day: a neoclassical production function, marginal product factor pricing, utility maximization by households, and so on and so forth.³¹ Yet it clearly demonstrates the distinct possibility that pragmatic market socialism might significantly out-perform contemporary capitalism in terms of various conventional indicators of socio-economic welfare. Whether it would or not appears to be an empirical question rather than a theoretical question—a question which probably could only be more or less definitively answered by means of an experimental implementation of pragmatic market socialism, with the intention of returning to capitalism should the performance of the system prove to be deficient.

Economists, of course, are highly enamored of the concept of rationality, and this predisposes them toward politically conservative rationalizations of the status quo. On the basis of the elementary observation that there does not exist any perceptible political movement at the present time toward the replacement of capitalism with pragmatic market socialism, many if not most mainstream Western economists would be inclined to presume that this lack is based on the sensible foundation that—to a very high degree of certainty—a pragmatic market socialist economy would be inferior to the existing capitalist economy. Thus they are likely to subject any evidence adduced in support of the pragmatic market socialist proposal to an exceptionally intense and critical scrutiny (that is, presuming that they trouble to examine such evidence at all).

To most economists skeptical of the results presented here, it would not be adequate to place the principal reliance, in defending capitalism against the pragmatic market socialist alternative, on the possibility that the numerical value of the output elasticity of capital management effort in the real world is a relatively high value of 0.040 or higher. Such a defense of capitalism is certainly consistent with the evidence obtained by this research. Moreover, it reduces the issue to one of empirical investigation rather than theoretical speculationwhich economists claim to be generally in favor of. Nevertheless, intellectual pride would make it very difficult for anyone predisposed in favor of capitalism to accept any enumeration and explanation of the arguments in favor of capitalism by someone such as myself who is clearly in favor of socialism (in the pragmatic market socialist form). It would no doubt be very tempting, to such an individual, to dismiss this author's rejection of the arguments for capitalism as the product of an incomplete understanding or inadequate appreciation of these arguments. Similarly, it would be very tempting to dismiss the evidence from the general equilibrium research presented here as highly inconclusive or even totally irrelevant.

It is especially important, therefore, that I conclude this study by responding to some of the possible objections which may be raised against the reported research. I do not mean to imply, by the above statements, that the objections to be mentioned here, as well as many others, are necessarily devoid of legitimacy. From the beginning, my writing on pragmatic market socialism has emphasized that the case to be made for this alternative to capitalism is in fact far from absolutely compelling, so that any implementation of the system ought to be considered experimental in nature, with the implication that the capitalist economic system would be fully restored if, after a reasonable trial period, the pragmatic market socialist system were performing poorly. However, having made that major concession, I hope that the reader will keep in mind the possibility that ideological preconception may unduly amplify and exaggerate the apparent significance of the following objections to the present research as lending appreciable support to the pragmatic market socialist alternative.

The first category of objections to this research consists of various technical objections to the model itself. A long list of such objections may be offered, such as the following: The Cobb-Douglas forms utilized for both the production function and the utility function are unduly restrictive, and do not allow for the examination of differences in the elasticity of substitution as between pairs of primary factors and household goods. In addition, there are non-standard elements incorporated into both of these functions: in the production function, labor is incorporated multiplicatively while capital management effort is incorporated additively; while the utility function includes the "effective assets" argument. No formal justification is provided for using the same output elasticity of capital management effort (γ) in both the aggregate production function and the individual household rate of return function. In addition, it is not consistent to differentiate the productivity of each household's labor and not differentiate the productivity of each household's capital management effort. The model contains numerous drastic simplifications: there is no disaggregation of consumption into various types of commodities, there is no explicit incorporation of public goods, the tax and welfare system reduces to a simple linear tax function plus a flat-rate subsidy to each household. The welfare economics used in evaluating the results of the model are faulty, in that utilization of the Benthamite sum of utilities function involves unscientific interpersonal comparison of utilities, and this utilization is thus unsound in a Pareto sense.

There is no escaping the fact that such objections as those enumerated do in fact reduce the strength of the qualitative conclusion drawn from the research that pragmatic market socialism might—given that the real-world value of γ is sufficiently low—perform better than contemporary capitalism. However, they do not render this evidence entirely negligible and insignificant. In terms of realism and relevance, the general equilibrium model developed for this research is on a par with most of the general equilibrium models currently utilized in economics to examine and illuminate various policy issues. There is inevitably a tradeoff between apparent realism and mathematical tractability: the more "realistic" a model becomes, in general, the more difficult becomes its manipulation and application. As a result, highly "realistic" models yield virtually no meaningful, useful results. Therefore, in practice some degree of realism has to be sacrificed in order to attain worthwhile results.

Every one of the departures from realism in the model under discussion here is motivated by the need to develop a model capable of shedding light on a very difficult—and so far mostly avoided policy question. In certain key respects, contemporary economics has little to offer in the way of guidance. In particular, there is no well-developed and widely accepted neoclassical theory of the return to the capital owner—as opposed to capital per se. Capitalist apologetics would prefer that the physical and philosophical distinction between a certain piece of inanimate capital such as a machine, and its human capital owner, be ignored. However, as one interested in the socialist alternative to capitalism, I have not ignored it. The theory proposed here of capital management effort is necessarily innovative because mainstream economics, excessively influenced by the standard preconceptions of capitalist apologetics, has for the most part ignored this issue.

In a word, the various simplifications of the model are necessary to the attainment of analytical and numerical tractability, while the various "non-standard" elements of the model are mainly the consequence of having to develop innovative approaches—in the absence of existing approaches—to the questions of interest. Any fair-minded economist will recognize that the general equilibrium model utilized in this research incorporates as much "standard economics" as it possibly can, in view of the difficult and unprecedented questions tackled. In fact, it is quite remarkable that a model which demonstrates the possibility of superior performance by a socialist economic system can and does utilize such a large proportion of the dominant economic paradigm of the present day. The model excludes external effects, excludes imperfect competition, excludes alternatives to profit maximization and/or utility maximization, excludes disequilibrium of any kind—and yet shows the possibility of superior performance by a socialist system. It need hardly be emphasized that among the vast majority of both traditional socialists and orthodox economists, it has long been assumed that drastic departures were required from the dominant paradigm of orthodox Western economics in order for the possibility to exist that socialism could be superior to capitalism in any meaningful sense. It is to be hoped that the present research will provide some redress against this widespread misapprehension.

The second category of objections to the research are more general and informal than those of the first category. They are similar in the overall sense of questioning the realism and relevance of the model, but the questioning is now based on broader considerations than the narrowly focused technical issues mentioned above. Two important sub-categories may be discerned within this general category: those stemming from the Austrian viewpoint, and those stemming from various "noneconomic" considerations.

Essential to the Austrian viewpoint on economics—and society generally—is that dynamic performance is much more important than static performance. This viewpoint is expressed, for example, in Schumpeter's hypothesis that the static efficiency losses from monopoly, relative to perfect competition, would be outweighed in the long run by the greater innovative potential of monopoly, this greater innovative potential translating into a higher rate of technological progress, i.e., a higher rate of growth of total factor productivity. It is also expressed in Ludwig von Mises's critique of the "artificial market," a market socialist proposal of the 1930s very much akin to pragmatic market socialism, on grounds that owing to irrational allocation of investment capital under the system, its dynamic performance would be abysmal, despite its possibly high level of static efficiency.³²

With reference to the general equilibrium model utilized in this research, a plausible specification of the Austrian objection would be to the assumption that the rate of growth of total factor productivity would be the same under pragmatic market socialism as it is under capitalism, as well as to concentrating mainly on initial period results. According to an Austrian school critic of pragmatic market socialism, the fact that pragmatic market socialism does better than capitalism in the initial period is of little consequence, because owing to a much higher rate of growth of total factor productivity under capitalism, after several periods the capitalist economy would dramatically exceed the performance of the socialist economy on every sensible economic criterion, with the possible exception of measures of equality.

In the judgment of this author, the Austrian school is certainly well justified in emphasizing the critical importance of innovation, investment, and technological progress to the dynamic performance of the economy. But at the same time, the Austrian school greatly underestimates the role of established corporations in these matters, while it greatly exaggerates the role of the solitary entrepreneur. And when the Austrian school insists that capital property income in the realworld capitalist economy is mostly or entirely an earned return to innovation, entrepreneurship, risk-taking, and other positive, productive, and worthwhile aspects of human endeavor, then it strays across the line into specious rationalization of the capitalistic status quo, a status quo which is both morally inequitable and economically unnecessary.

There may indeed be a small kernel of truth in the Austrian viewpoint, in the sense that occasionally the solitary entrepreneur plays an important catalytic role in the economy. This small kernel is recognized in the pragmatic market socialist proposal, through the provision for private ownership of entrepreneurial firms by their founder-owners. Conceivably as much as five or ten percent of observed capital property return under contemporary capitalism goes to genuine entrepreneurs. The great majority of this return, however, is received by individuals who have never devised any product or process innovations, who have never founded a business enterprise, and who keep themselves well insulated against any appreciable degree of risk through the elementary expedient of portfolio diversification. In the real-world modern industrial economy, the product and process innovations which govern the rate of technological progress, the competitive invasions of new markets which maintain efficiency and consumer sovereighty, as well as the inherent risktaking which inevitably accompanies these endeavors, are all undertaken almost entirely by the employees and executives of existing corporations—most of them large-scale, and most of them having long since seen the departure of their founders.

Given the institutional nature of the pragmatic market socialist proposal, with its provision for private ownership of entrepreneurial firms, with its provision for direct allocation of government revenue into business capital investment, with its dynamically oriented agencies: the NIBS and the NEIB, with its BPO imposing a strong impetus toward competitive profit maximization among the executives of the publicly owned business enterprise sector, with its probable avoidance of excessive egalitarianism in terms of social redistribution of market income-given all this, there is simply no justification for assuming that the rate of growth of total factor productivity would be lower under pragmatic market socialism than it is under capitalism. If anything, it would seem more realistic to propose that the rate of growth of total factor productivity is positively related to the aggregate output level—because higher output (which translates into higher corporation revenues and profits) makes available more resources for the research and development efforts that drive the rate of technological progress. Thus if the pragmatic market socialist economy displays higher output than the equivalent capitalist economy, as it does in the benchmark solutions obtained in this research, then it would be fully reasonable to expect that the growth rate of total factor productivity would also be higher under the former economic system than the latter. This particular linkage, however, is not incorporated into the model on grounds of conservatism.

All this is not to say that the Austrian school is necessarily wrong about pragmatic market socialism not performing as well as capitalism. But the fact remains that the logical essence of the Austrian case against pragmatic market socialism may be adequately represented within the context of the general equilibrium model utilized here. The Austrian school maintains that, in general, socialism would not work as well as capitalism because the nonowning capital managers under socialism (the BPO agents and other BPO personnel of the pragmatic market socialist proprosal) would not receive sufficient income-in terms either of current property income or of future income to be realized from the sale of capital assets-to motivate them to undertake an adequate amount of capital management effort (particularly in the form of entrepreneurship). In other words, the retention coefficient (α) would be too low under pragmatic market socialism, and owing to the upward-sloping supply curve of capital management effort, the low effective wage of capital management effort would translate into a low level of capital management effort, a low level of capital productivity, and poor economic performance. The sensitivity results obtained on the output elasticity of capital management effort demonstrate that this claim is well within the realm of possibility. If capital property income is to a significant extent earned (that is, if the numerical value of the elasticity of capital management effort is sufficiently high), then pragmatic market socialism performs poorly relative to capitalism. But this is essentially a "static efficiency problem"—which may or may not translate into a dynamic performance problem as well, depending on whether the growth rate of total factor productivity is or is not positively related to the output level.

The insistence in Austrian thinking on the qualitatively different nature of static and dynamic performance is in fact a logically muddled red herring. Decision-making within the contemporary corporation simultaneously involves static and dynamic aspects: the executives of the corporation are just as deeply and continuously concerned with the dynamic issues of product and process innovation, investment, and market expansion, as they are with the static issues of current production and marketing. In practice, these issues are closely interrelated, and are not the isolated and mutually exclusive categories represented by Austrian economics. In fact, much the same decision-making tools are utilized, whether the time frame is short ("static analysis") or long ("dynamic analysis"). As a matter of fact, one of the basic problems with Austrian thinking is its inadequate recognition and appreciation of the dominant role of large-scale corporate activity in all aspects of the modern industrial economy. Just as corporate enterprise dominates the direct productive activity of the modern economy, so too it dominates the financial

activity which accompanies this productive activity. In obtaining capital for investment, most firms deal far more with financial intermediaries of various sorts than they do with the individual investing capitalists so prominently featured in Austrian economics.

It is unwise for Austrian thinkers to concede—as Mises did in his discussion of the "artificial market"-that a socialist economy might well be statically efficient. Once the possibility of static efficiency is conceded, those with a proper appreciation of the realities of the modern corporate economy will recognize that the same factors and conditions which generate static efficiency will also generate dynamic efficiency. As pointed out above, however, it is not at all necessary for Austrian thinkers to make this concession, in that the basic critique of socialism promulgated by the school is logically consistent, represents a definite empirical possibility, and applies to the overall performance question, whether taken "statically" or "dynamically." However, for the usual reasons of intellectual pride, it would no doubt be as difficult for Austrian school critics of socialism to take instruction in capitalist apologetics from a proponent of socialism as it would be for critics of socialism from any other school.

Turning to the noneconomic problems of socialism, the Austrian school of course makes a great deal of these as well, but they are in a somewhat different category from those stemming directly from the static-dynamic dichotomy characteristic of the economic component of the overall Austrian viewpoint. As mentioned in Chapter 2, discussion of the key political issue of the potential threat posed to democracy from public ownership of capital will be foregone herein, on grounds that the matter is too far afield from the economic focus of this research. Most of the other noneconomic problems of socialism perceived by its critics consist of extrapolations from the perceived deficiencies of the two forms of real-world socialism which have been observed throughout the twentieth century: communistic socialism, and social democratic socialism.

From communistic socialism as practiced, for example (until recently), in the Soviet Union and Eastern Europe, it is proposed that socialism necessarily involves such things as bureaucratic strangulation of the economy through over-enthusiastic and over-detailed central planning, a soft enterprise budget constraint (guaranteed subsidies to compensate any amount of losses) stemming from the faulty ideological preconception that bankrupcies under capitalism are necessarily a dysfunctional manifestation of the "anarchy of the market," excessive job security of the workforce stemming from the faulty ideological presumption that the individual worker is always blameless and that dismissals under capitalism are either the result of needless depressions or part of the political domination of the proletariat by the capitalist class. As a fundamental economic result of these "noneconomic" problems, it could be argued, the total factor productivity in any sort of socialist economy (the A parameter in the production function of the general equilibrium model developed here) will necessarily be substantially lower than the total factor productivity in an otherwise equivalent capitalist economy. From social democratic socialism as allegedly practiced, for example, in the Scandinavian nations, it is proposed that socialism will necessarily generate an extreme and excessive degree of economic egalitarianism and a suffocating level of paternalistic intervention in the affairs of the private citizen. This will be manifested, economically, in an extremely high level of progressivity in the individual tax system (a very high τ , in the model developed here), accompanied by a large welfare system (a high c_m , in the model developed here). As a result, output will be quite low, and social welfare will also be quite low.

The general equilibrium model used in this research applies the same numerical value of the total factor productivity parameter A (which is the model gauge of the overall efficiency of the economy), and the same numerical value of the tax rate parameter τ (which is the model gauge of the level of redistribution), under capitalism and pragmatic market socialism. Critics of socialism relying on the above types of arguments will claim that this is unrealistic: that in fact A would be much lower under pragmatic market socialism than it is under capitalism owing to the same defects that have characterized real-world communistic socialism than it is under capitalism owing to the same defects real-world social democratic socialism. The argument is basically that various institu-

tional and attitudinal adjustments and improvements are wholly impossible under socialism, so long as the capital stock continues to be mostly owned by society—that there can be nothing new under the sun.

The obvious response to this type of argument, in general, is that clearly there can be new things under the sun-the history of human civilization itself is testimony to the possibility of learning from past mistakes, of devising new social forms, of advancing and progressing. To deal with the argument more specifically, however, would be a major undertaking far beyond the scope of this technically oriented contribution. Much suggestive evidence could be mustered from intellectual history, real-world history, and the human and social sciences-but it is probably fair to say that this great bulk of evidence would be far from conclusive in any scientific sense, and that personal intuition and subjective judgment would loom large in any individual assessment of this evidence. On the one hand, it is certainly true that the great majority of those who have in the past espoused the cause of socialism have been very skeptical of the free market, and have been highly predisposed toward social intervention in the form of regulation, planning, and redistribution. On the other hand, pragmatic market socialism represents an effort to seek a new direction for socialism, to extract from the fundamental idea of socialism a relatively simple and straightforward institutional reform which would result in an appreciable, if not substantial, gain in social welfare. While not as radical and comprehensive as most of those plans put forward as "socialist blueprints" in the past, pragmatic market socialism has the extremely important virtue of practicality---it represents a truly viable option.

Clearly, pragmatic market socialism would represent an evolutionary rather than a revolutionary transition beyond contemporary capitalism. It is not argued nor expected that the implementation of this economic system would create any sort of utopian condition in human society. But the history of social progress has, on the whole, been that of a series of marginal advances, each one of which might have seemed unimportant in and of itself. Pragmatic market socialism might become one of these short steps on the long path of human progress. It is the hope of the author that the present contribution to the evaluation of pragmatic market socialism will inspire related work on this particular market socialist possibility. It is not really legitimate to ignore this possibility because at the present time there is not an existing political movement toward the implementation of pragmatic market socialism. What would be the use of having a class of scholars and intellectuals if this class always and invariably plays a passive role, and confines its efforts exclusively to the desciption and analysis of existent reality? Certainly description and analysis of existent reality is very important, but in the final analysis, the ultimate test of the value of knowledge is its practical usefulness in advancing the respective causes of individual welfare and human civilization.

Nor should the unlikelihood of a movement toward pragmatic market socialism arising over the next few decades be exaggerated.³³ In the collapse of Soviet communism, humanity has just had a dramatic lesson in the rapid transformation of what seemed a near impossibility to an existent reality. While in some quarters the collapse of Soviet communism is taken as final evidence of the "death of socialism," this expectation may be premature. A great many factors contributed to the downfall of Soviet communism, and it is by no means evident that public ownership of capital, in and of itself, was a major source of weakness. With the demise of the Cold War, capitalism may not be able to wrap itself up so effectively in the flag, to enlist so readily in its own self-defense the emotionally potent force of nationalism. Another point is that the recent collapse of Soviet communism, in a very broad sense, demonstrates the feasibility of social experimentation-of implementing a social system, living with it for a time, and then-if its performance is disappointing-of repealing it and going back to an earlier social system. Surely, if the Russian people are capable of reversing the relatively gigantic and all-encompassing social transformation initiated by the Bolshevik Revolution of 1917, then the citizens of an economically and politically advanced nation such as the U.S. would be able to reverse the relatively minor transformation involved in establishing pragmatic market socialism-should this economic system, after a reasonable trial period, be performing poorly.

A final question concerns the generalizability of the fundamental

results of the research reported here. Obviously the basic question of the potential relative performance of a pragmatic market socialist economy might be tackled using a great host of formal and informal models, neoclassical and otherwise. To the extent that these models are more "realistic" or "general" than the model examined here, their mathematical analysis might prove quite demanding. Those whose "instincts" tell them that pragmatic market socialism would be ineffective relative to capitalism (whether owing to bureaucratic strangulation, entrepreneurial breakdown, or whatever) might be tempted to speculate that properly specified models would unambiguously demonstrate this ineffectiveness on theoretical grounds. But until these models are actually produced, this speculation merely begs the question. In the meantime, the expectation of this author remains that any economic model purporting to "prove" the inferiority of pragmatic market socialism to contemporary capitalism would necessarily incorporate key assumptions which clearly manifest ideological opinion rather than scientifically known fact.

Notes

Notes to Chapter 1

page 1

1. It is interesting to speculate on whether Lange's market socialist proposal would be as well known today if it had not received something akin to an "official stamp of approval" by being made the centerpiece of Abram Bergson's contribution on "Socialist Economics" to the American Economic Association's 1948 A Survey of Contemporary Economics. A later article on Lange's proposal by Bergson in the Journal of Political Economy (1967) added a few nuances to the discussion but reiterated the basically negative judgment expressed in the 1948 essay. Although Bergson's critique of Lange was not as vigorous as Hayek's well-known 1940 article, his lukewarm appraisal had a profound impact on the profession's attitude toward the Langian proposal. This may be gauged from the numerous comparative systems textbook treatments of the Langian plan, which continue to be heavily influenced by Bergson's 1948 and 1967 articles. For example: Milenkovitch, 1984; Zimbalist and Sherman, 1984, Chapter 14; Gregory and Stuart, 1985, pp. 133-143; Elliott, 1985, Chapter 15.

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2. Ludwig von Mises is still remembered as the principal spokesman for the pre-Langian attitude that the market and socialism are contradictory. At least three contemporary students of the socialist calculation debate have argued that contrary to the implication in Bergson's 1948 appraisal of the Langian proposal, the proposal did not successfully respond to Mises's arguments (Vaughn, 1980; Murrell, 1983; Lavoie, 1985). The present author made the same suggestion in his first published article on pragmatic market socialism (Yunker, 1974: p. 199), which went on to propose that the pragmatic market socialist concept provides a generally more satisfactory response to the fundamental Austrian school concerns than does the Langian market socialist concept.

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3. Benjamin Ward amplified his 1958 model of the production cooperative

in Chapters 8-10 of his 1967 book. The size of the post-Ward theoretical literature may be judged from the extensive reference lists in the early survey articles by Steinherr (1978) and Pryor (1983) published in the *Annals of Public and Cooperative Economy*. Since these surveys, the accumulation of literature on the theory of the cooperative has continued unabated. While most of this literature seems basically skeptical of cooperative production, there are some notable exceptions. For example, Jaroslav Vanek has contributed a major advocacy of cooperative market socialism from the basic methodological viewpoint of neoclassical economics in three substantial volumes published by Cornell University Press (1970, 1971, 1977).

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4. In the author's dissertation (Yunker, 1971) and first published article on market socialism (Yunker, 1973), Langian market socialism was appraised in a generally sympathetic manner. However, this attitude was adopted "for the sake of argument." Long before this material was written, I had fully subscribed to the consensus view that Langian market socialism was devoid of practical interest. My personal judgment on cooperative market socialism, on the other hand, is less skeptical. This is a form of economic organization that might be quite efficient under the right circumstances.

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5. Vanek has expressed the point in this manner: "The relation between participation in decisions and income on the one hand and the quality and intensity of work on the other brings out what is probably the greatest stength of the system under study. The labor-managed firm is without doubt best suited to generate optimal incentives to work—best suited, that is, for the members of the collective to find the optimal level of work effort in relation to the income of the firm generated by the effort, and in relation to other possible objectives of the firm" (1971, p. 31).

Notes to Chapter 2

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6. Owing to the usual space constraints operative in professional journals, the institutional descriptions of pragmatic market socialism contained in my various articles have been quite sketchy. While the discussion of institutional details given here is somewhat longer than in any of the articles, it is still far from being adequate. Interested readers can find more institutional details in Chapter 2 of *Socialism Revised and Modernized*. But even that

account is by no means as fully comprehensive as I would have liked. *Socialism Revised and Modernized* is actually a rather drastic condensation from a very lengthy prior manuscript which remains unpublished. Despite their critical importance to the issue of feasibility, both readers and editors seem to have a low tolerance for detailed descriptions of hypothetical institutions.

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7. If there can be said to be a cult of entrepreneurship within modern economics, no doubt its high priest is Israel M. Kirzner, author of such tomes as Competition and Entrepreneurship (1973), Perception, Opportunity and Profit (1979), and Discovery and the Capitalist Process (1985), and who since the death of Hayek has taken over the status of being the leading living exponent of the Austrian worldview. Among other things, Kirzner has added a new catchword to the armory of capitalist apologetics: "discovery." Entrepreneurship is without doubt the single most influential purported justification for large-scale capital wealth: see, for example, Blitz and Siegfried (1992) and Siegfried and Roberts (1991). Insofar as its primary apparent purpose is to provide a quasi-mystical justification for the capitalist status quo, this type of literature is largely obscurantist and specious. However, any attempt to oppose it directly would be akin to direct opposition to any sort of religious idea: unwise. The pragmatic market socialist proposal attempts to sidestep this potent defensive weapon of capitalism by means of the retention of private ownership of genuinely entrepreneurial firms (i.e., firms still being personally managed by their founder-owners).

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8. Two of the author's articles on pragmatic market socialism focus specifically on social dividend distribution of capital property income: "The Social Dividend under Market Socialism" (*Annals*, 1977), and "The People's Capitalism Thesis: A Skeptical Evaluation" (*ACES Bulletin*, 1982). See also Yunker, *Socialism Revised and Modernized* (1992), Chapter 7.

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9. One of the most fundamental objections to the basic concept of market socialism is that authentic competition is logically impossible under any form of socialism because most or all firms are owned by the same public authority. The institutional proposal for pragmatic market socialism meets this objection through substantial delegation and dispersion of public authority over business enterprise via the BPO agent approach. While critics of market socialism are likely to be skeptical of the success of this approach, they should perhaps note the following passage from the well-known Austrian school authority Ludwig von Mises, an adamant critic of all forms of socialism including market-oriented forms (*Human Action*, p. 310): "Every manager and submanager is responsible for the working of his section or subsection. It is to his credit if the accounts show a profit, and it is to his disadvantage if they show a loss. His own interests impel him toward the utmost care and exertion in the conduct of his section's affairs. If he incurs losses, he will be replaced by a man whom the entrepreneur expects to be more successful, or the whole section will be discontinued. At any rate, the manager will lose his job..." This passage seems to suggest the feasibility of authentic competition between different divisions of the same conglomerate firm, even though they are under a unified ownership authority. This in turn suggests the feasibility of authentic competition between different publicly owned firms, even though they are under the unified ownership authority of the BPO.

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10. The potential new national government operated financial intermediaries, the NIBS and the NEIB, are the focus of two of the author's articles (*Revista*, 1978; *JEI*, 1986), both of which argue that a pragmatic market socialist economy would be likely to support a higher rate of business sector physical capital accumulation than the contemporary capitalist economy. The 1978 *Revista* article utilizes a small-scale analytical model of the aggregate economy to support the argument, while the 1986 *JEI* article utilizes a small-scale numerical simulation model based on econometrically estimated equations. See also *Socialism Revised and Modernized*: Chapter 6, Section C. As the argument hinges on the varying propensity between the two systems to convert ex ante saving into ex post investment, it cannot be examined within the context of the general equilibrium model developed in this research, which assumes that all ex ante saving is translated into ex post investment.

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11. The political argument against socialism has been developed by Milton Friedman in *Capitalism and Freedom* (1962, pp. 15-19). Friedman's personal position is not that the argument is necessarily valid, but rather that: "None of the people who have been in favor of socialism and also in favor of freedom have really faced up to this issue, and even made a respectable start at developing the institutional arrangements that would permit freedom under socialism." As the author is in favor of socialism and also in favor of freedom (in the political democracy sense), I took up this particular

challenge to socialism in an article published in *Polity* (1988). See also *Socialism Revised and Modernized* (1992), Chapter 8. Certain legal and institutional provisions are put forward for the protection of democracy, but it is also argued that historical circumstances and social attitudes are far more important to the preservation of democracy than legal and institutional provisions—which means that in traditionally democratic polities such as the United States and the nations of Western Europe, socialism would constitute a negligible threat to democracy.

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12. The two primary sub-categories of the general category of capital management effort are: (1) corporate supervision; (2) investment analysis. "Entrepreneurship" can be interpreted as a combination of these two subcategories: "investment analysis" as the entrepreneur considers founding a business enterprise, followed by "corporate supervision" after the enterprise has been founded. In the partial equilibrium model of this section, capital management effort can be (reasonably) realistically interpreted as either corporate supervision or investment analysis. But one of the deficiencies of the general equilibrium model developed below in Chapter 3 is that capital management effort is effectively confined to corporate supervision. This is because in the socialist variant of the model, capital management effort is provided exclusively by the Bureau of Public Ownership, which deals solely with established corporations, most of which would be nonfinancial corporations, although some would be financial. Under pragmatic market socialism, capital management effort in the form of investment analysis would be provided by the loan officers and investment analysts of financial intermediaries such as banks, insurance companies, pension funds, and so on. Their efforts would probably be supplemented by those of NIBS and NEIB personnel. But neither loan officers and investment analysts of financial intermediaries, nor personnel of the NIBS and NEIB, would be directly employed by the BPO. Therefore the model does not cover the investment analysis component of capital management effort. Of course, it has to be recognized that any theoretical model which endeavors to encompass all of the institutional nuances of the real world would quickly become impossibly complicated.

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13. This model of the representative capital manager was introduced in the author's first published article on pragmatic market socialism: "Capital Management under Market Socialism" (*RSE*, 1974). The model was further developed in a 1976 article in the *ACES Bulletin*, and still further developed

in an unpublished working paper ("Is Property Income Unearned?") issued in 1987. It was again reviewed in "A New Perspective on Market Socialism" (*CES*, 1988). Most recently, the model was utilized to examine the capital management issue in *Socialism Revised and Modernized* (1992): Chapter 4, and Section A of the Analytical Appendix. As is apparent, in the author's judgment this model is extremely useful for purposes of illuminating this fundamental issue in the evaluation of the potential economic performance of a pragmatic market socialist economy.

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14. Two explicit mathematical forms capable of representing the plateau production function are the logistic (Yunker, 1988, Table 1), and the power (Yunker, 1992, Analytical Appendix). The latter of these is utilized in the research reported herein.

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15. My 1979 JEI article "revisiting" the question of the microeconomic efficiency of market socialism contains an extended evaluation of the argument that an activist BPO under pragmatic market socialism could elicit a higher level of performance from top corporation executives by means of reducing their job security below the level they currently enjoy under the contemporary capitalistic conditions of atomization of the outside ownership authority over the typical large corporation. The article elicited a comment by Peter Murrell to which I replied (1981). The argument is based on the separation of ownership and control, first studied carefully by Adolf A. Berle and Gardiner C. Means, a phenomenon whose implications are much pondered and debated. The key question is whether separation has resulted in reduced effort incentives of executives and/or a reduced profit motivation. The sales maximization hypothesis of William Baumol (1967) and the managerial slack model of Oliver Williamson (1964) are two of the better-known theoretical alternatives to profit maximization inspired by the work of Berle and Means on the separation of ownership and control.

Eugene Fama (1980, 1983) and Michael Jensen (1976, 1983, 1985) have provided vigorous arguments suggesting that the separation of ownership and management has not seriously attenuated the authority of the legal owners. The accumulating statistical evidence does indeed suggest that managerial compensation and job tenure are positive functions of indicators of firm profitability. But this indication is not necessarily inconsistent with the hypothesis that for any given level of profitability, the level of managerial compensation and job tenure is presently higher than the optimal level in terms of the interests of the owners in profit maximization. As Jensen and Zimmerman concede in their editors' introduction to the 1985 Journal of Accounting and Economics symposium on managerial compensation and the managerial labor market (p. 8), the research to date does not address the salient question whether executive compensation is "too high."

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16. That "excessive job security" can reduce incentives to effort is a well-known proposition from popular socio-economic thinking, as applied, for example, to civil servants in government bureaucracies, to tenured professors in the higher education system, and to the so-called "iron ricebowl" in the Asiatic communist nations. Excessive job security has also been proposed as one of the fundamental weaknesses of the recently decreased system of Soviet communism. According to David Granick's last book on the Soviet economy, the fundamental reason for its inefficiency was not so much the inherent over-centralization and inflexibility of central planning per se, nor was it the inability of central planners to discipline the managers of enterprises which consistently registered losses. Rather these and other aspects of inefficiency were the result of an ideologically rationalized guarantee by the political authorities of almost total job security to the workers.

Despite its intuitively obvious importance to the real-world economy, so far labor economics has not developed a theoretically compelling theory of "job security." The closest approach to such a theory has probably been the work on "implicit contracts," as surveyed, for example, by Sherwin Rosen (1985). The relevance of this work to the present concern seems rather tenuous. The central purpose of the implicit contracts literature is to analyze the phenomenon of temporary layoffs by firms under conditions of cyclically reduced demand, rather than to analyze permanent dismissals by firms under conditions of stable demand. In the implicit contracts literature, job security, in the sense of a promise of re-employment at the time of layoff, is for the most part viewed very positively: implicit contracts achieve an equitable distribution of the risks of cyclical demand downturns as between employers and employees. There is no consideration of possible adverse effects of too much job security on employee incentives and productivity.

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17. The concept of time preference, developed by Eugen von Böhm-Bawerk to replace the badly named theory of "abstinence" developed earlier by Nassau Senior, proposes a moral, as well as an economic, justification for interest income and other forms of property income: this income is a necessary offset to the disutility of postponing consumption necessarily endured owing to time preference. For a critique of time preference as a moral-economic justification for property income, see the author's 1992 article in the *Journal of Post-Keynesian Economics*.

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18. That social intervention in the aggregate saving decision is unlikely to cause serious economic harm is indicated by the following quote from Mark Blaug (1985, p. 193): "The bulk of rentier income, as Mill makes clear, consists of intramarginal surpluses, pure Ricardian rents, which accrue to the saver through no effort of his own. And, of course, there is nothing in the theory that justifies the private ownership of property as such. If abstinence is required for capital accumulation, society as a whole can bear the burden just as well."

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19. See Yunker (1992, Chapter 7, Section B) for details on this estimate. A slightly modified version of this approach was used in my 1982 article on people's capitalism. As a result, there are some minor numerical discrepencies between Table 7.3 of the book and Tables 3 and 4 of the 1982 article. However, the results are qualitatively the same.

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20. See Yunker (1992): Chapter 7, Section D, discussion of Tables 7.5 and 7.6.

Notes to Chapter 3

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21. The general equilibrium model developed herein is an extension of the model utilized in the author's 1989 contribution on "Social Welfare Maximization" to include saving and capital management effort in addition to labor. The author's 1987 working paper on the "Equity-Efficiency Tradeoff" contains a fairly substantial discussion of the model validity question for the simpler model, as well as extensive comments on issues relating to numerical specification of the relative performance of pragmatic market socialism in "The Equity-Efficiency Tradeoff under Capitalism and Market Socialism" (*EEJ*, 1991).

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22. Two important literatures may be cited in general support of utilizing a variable based on financial assets as a direct argument in the utility function: (1) the literature on "money in the utility function" as a microeconomic foundation for the macroeconomic Keynesian demand for money function, and (2) that subset of the overall literature on life-cycle saving which postulates a "bequest motive." The authoritative textbook on microeconomic theory by Henderson and Quandt (1980) contains an example of money as an argument in the utility function (pp. 251-252) on grounds that "money facilitates exchange." See also Brunner and Meltzer (1971) and the recent *JEL* survey article by Barrett, Fisher, and Serletis (1992). An authoritative reference on the bequest motive in life-cyle saving analysis is Kotlikoff (1989). Orosel (1991) includes wealth in the utility function on grounds not only of a bequest motive but also of a prestige motive.

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23. Empirical evidence on labor provision by the very wealthy, and the possible implications thereof, are discussed in Yunker and Krehbiel (1988). As for saving, it is "common knowledge" that the very wealthy save a lot despite their wealth. For example, on the importance of saving to the economy and on the important role of the wealthy in providing it, see Seidman (1989). The extreme sensitivity of both labor supply and saving supply among the wealthy to variations in the asset retention parameter χ may be seen in the following table, the first row of which shows the labor and saving supplies of the highest decile household for the benchmark solution of the capitalist variant of the general equilibrium model developed in this research (see Table 4.1, Case iii, and Table 4.2 below):

	general e	quilibrium	partial equilibrium	
χ	l_1	<i>s</i> 1	l_1	<i>s</i> 1
1.01	.1600	.0111	.1600	.0111
1.00	.1399	.0044	.1214	.0040
0.99	.1234	0023	.0828	0030
0.98	.1096	0091	.0443	0101
0.97	.0980	0158	.0057	0172
0.96			0328	0243
0.95			0713	0314
0.94			1099	0385
0.93			1485	0456

The "general equilibrium" solution values are obtained from the general equilibrium model; the "partial equilibrium" solution values are obtained from the household model in isolation (i.e., holding constant various household parameters, such as the wage rate, which are endogenous variables in the general equilibrium model). The solution procedure in the general equilibrium model breaks down if negative labor values are encountered in the iterative process, accounting for the lack of solution values for χ less than 0.97.

It is perhaps worth noting that one potential alternative to the "asset retention" feature of the model as a means of explaining why the real-world wealthy tend to provide both labor and saving would be different utility functions for different individual households. For example, the wealthier households might be postulated to have higher preferences for consumption and lower preferences for leisure. But since the physical attributes of different individuals seem so much alike, it may be unduly speculative to postulate substantial differences in preferential attributes.

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24. The only more recent survey which rivals the 1963 FRB Survey of Financial Characteristics of Consumers is the 1983 FRB Survey of Consumer Finances (Avery, Elliehausen, Canner and Gustafson, Sept. and Dec. 1984; Avery and Elliehausen, 1986). Although based on a somewhat larger sample of families, the questionnaire used in the later survey was quite a bit less detailed. In addition, considerably less information from the later survey was published by the Federal Reserve Board. The 1963 survey was reported in two substantial books, published in 1966 and 1968, totaling 487 pages. The three articles in the Federal Reserve Bulletin which reported the 1983 survey total only 45 pages. The precise size distribution of capital wealth for 1963 utilized as a reference point in this research cannot be ascertained from published data on the 1983 survey, but it could be obtained from the raw data files. It is the author's belief that for purposes of this particular research, the advantages of using data which can be verified from published sources outweigh the advantages of using more recent data.

The level of inequality in capital wealthholding indicated by Table 3.3 is of course very extreme, but even so it might actually be an underestimate of the true level of inequality at the present time. In a 1987 study of capital wealth inequality based on microdata from both the 1963 Survey of Financial Characteristics of Consumers and the 1983 Survey of Consumer Finances, Edward N. Wolff found higher inequality at the later date. In addition, there is considerable evidence of underreporting of capital wealth in surveys: see, for example, Juster and Kuester (1991).

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25. The source manuscript is entitled "Capital Management under Pragmatic Market Socialism: An Explicit Function Analysis" and is available from the author.

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26. This fundamental indication has previously been found in the context of a simpler general equilibrium model involving labor alone, and without saving and capital management effort, in the author's article "The Equity-Efficiency Tradeoff under Capitalism and Market Socialism" (*EEJ*, 1991). Benchmark simulation results from the simpler general equilibrium model indicate that the pragmatic market socialist economy would produce 13.87 percent more output than the equivalent capitalist economy, while at the same time having a consumption Gini coefficient 23.28 percent less. The benchmark social welfare advantage of pragmatic market socialism was found to be 2.55 percent. Adding saving and capital management effort to the model reduces the estimated advantage of pragmatic market socialism in the benchmark case (10.5 percent rather than 13.87 percent more output, 13.8 percent rather than 23.28 percent less inequality, and 1.7 rather than 2.55 percent more social welfare), but does not eliminate the advantage.

In response to the potential objection that a 1.7 percent gain in social welfare would be insignificant, two major points may be made. First, reference to the author's article on "Social Welfare Maximization" (Public Finance, 1989) demonstrates that the Benthamite sum-of-utilities social welfare measure is remarkably unresponsive to changes in economic conditions when compared to the both the Nash product-of-utilities measure and the Rawls maximin-utility measure. Therefore the numerically small gain in the social welfare measure should not be allowed to obscure the numerically more substantial gains in output and consumption equality. Second, the modern concept of social progress is that of a succession of marginal gains, each one of which might be considered insignificant in and of itself. In this light, a 1.7 percent social welfare gain is significant. Of course, speculative arguments could be made that the implementation of pragmatic market socialism would generate significant risks of severe economic deprivation and/or of political totalitarianism. These kind of arguments are too nebulous to be assessed in a technical contribution such as this. Obviously, in this author's personal judgment, such arguments are

inadequate as justifications for the inequitable capitalistic status quo.

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27. It is perhaps worth noting that the use of the word "efficiency" here while consistent with standard practice in the literature on the equity-efficiency tradeoff—is technically incorrect. As the production function exhibits continuously diminishing returns to labor, anything which raises labor supply generates inefficiency in the sense of lower average product of labor and lower marginal product of labor. Questions could also be raised concerning the legitimacy of using "equality" as a conceptual proxy for "equity." Despite such subtleties, for most people the commonly prevailing interpretation of the phrase "equity-efficiency tradeoff" is clear, sensible, and intuitively appealing.

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28. In the author's 1989 paper in *Public Finance*, a simplified version of the capitalist variant of the general equilibrium model utilized here is specified, and solutions of the model show an optimal tax rate of around 0.39, which is fairly close to the average tax rate in the United States at the present time. It is argued that this result provides interesting, if not compelling, evidence that the theory of social welfare maximization may actually possess positive content, as opposed to being, as always heretofore assumed, a purely normative construct.

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29. The model result is consistent with the author's prior work on the people's capitalism thesis, which indicates that, on the assumption that 5 percent of property return would be retained by the BPO under pragmatic market socialism, and that there would be no change in the output level, well over 90 percent of the United States population would receive more social dividend income than they currently receive property income (more precisely, 94.4 percent in the 1982 ACES Bulletin article, and 94.21 percent in Chapter 7 of Socialism Revised and Modernized (1992)). This work on people's capitalism does not address the capital management question explicitly, but merely presumes that 5 percent retention by the BPO would suffice to elicit virtually as much effective capital management effort as currently exists under capitalism.

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30. It should be pointed out that abandoning the "optimal" assignment and retention coefficient values in favor of more "politically realistic" parameter

values does not drastically impair the relative performance of the pragmatic market socialist economy, as calculated by the model. For example, if we use an assignment coefficient of 0.01 (1 percent of first decile households, or 100,000 households) and a retention coefficient of 0.005 (one half of one percent), the pragmatic market socialist economy shows 9.8 percent more output than the capitalist economy, a Gini coefficient of consumption 14.3 percent less, and a sum-of-utilities social welfare measure 1.0 percent higher. It may be ascertained that the decline in social welfare is caused by the decline in the assignment coefficient rather than the decline in the retention coefficient: that is, the general equilibrium model studied here confirms the result obtained in the author's unpublished 1989 theoretical paper for the assignment coefficient but not for the retention coefficient.

Notes to Chapter 5

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31. At a conference on market socialism organized by John Roemer and held in Berkeley, California, in May of 1991, one of the participants, Martin Weitzman of Harvard University (the developer of the "share economy"), referred to the Walrasian perfect competition general equilibrium paradigm as the "workhorse of contemporary economics," and argued vigorously that it is not legitimate to accept the results from one particular application of this paradigm because they happen to be in agreement with certain intuitive preconceptions—while rejecting results from another application of the paradigm because they happen to be in disagreement with such preconceptions. Although Professor Weitzman was not necessarily directing his comments to the author's work (a preliminary article-length exposition of this research was presented at the conference), they most certainly apply.

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32. Understandably enough in view of the general enthusiasm among prosocialists for the planning concept, the prominent Austrian school figures of the twentieth century, Ludwig von Mises and Friedrich Hayek, mostly disputed the efficacy of planning in their critiques of socialism. But both also took critical note of the market socialist concept. While they dealt mostly with Lange's plan (designated the "competitive solution" in Hayek's 1940 *Economica* article), Mises also criticized the essence of the pragmatic market socialist concept under the "artificial market" designation, both in *Socialism* (1951, pp. 137-142) and *Human Action* (1966, pp. 705-710). The author's recent article entitled "Ludwig von Mises on the 'Artificial Market'" (1990) offers a detailed rebuttal of the argument put forward by Mises in the cited passages. The rebuttal is also included in *Socialism Revised and Modenized* (Yunker, 1992, Chapter 6, Section A). Another of my articles on pragmatic market socialism broadly related to this issue is "Risk-Taking as a Justification for Property Income" (*JCE*, 1988).

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33. Over the last several years, there has been a veritable explosion of literture on wealth and income inequality. Some examples include Bishop, Formby and Smith (1991), Braun (1991), Campano (1991), Dagum and Zenga (1990), Dovring (1991), Levy and Michel (1991), Maxwell (1991), Oliver and Shapiro (1990), Osberg (1984), Ryscavage and Henle (1990), and Winnick (1989). Much of the emphasis in these contributions is on the fact that a variety of inequality indicators suggest significantly increasing inequality over the last few decades. This information is frequently imparted in rather dissatisfied and even alarmist terms. A significant subset of this literature especially targets the very wealthy: Bottomore and Brym (1989), Packard (1989), Toshiyuki (1991), Inhaber and Carroll (1991), Carroll (1991). Some of these contributions bear comparison with such important anti-establishment works of a generation ago as Mills (1956), Kolko (1962), and Lundberg (1968). Although heightening concern over increasing inequality will not necessarily generate a meaningful challenge to the capitalistic status quo, that status quo is perhaps not quite as unassailable now as it was a decade or so ago during the height of the Reagan ascendancy.
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