

Whither Socialism?

Joseph E. Stiglitz

The Wicksell Lectures

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Peter A. Diamond, 1982

The Informational Role of Prices, Sanford J. Grossman, 1989

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The Wicksell Lectures

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In 1958 The Wicksell Lecture Society, in cooperation with the Social Science Institute of Stockholm University, the Stockholm School of Economics, and the Swedish Economic Association, inaugurated a series of lectures to honor the memory of Knut Wicksell (1851–1926). Until 1975 lectures were given each year. After a period of dormancy the series was reinaugurated in 1979 by the Swedish Economic Association. Starting with the 1982 lectures, a set of lectures has been offered every two years.

viable alternative. It provided a model of the economy that seemed too distant from the underlying forces which generated support for Marxian economics in its hypotheses, its descriptions, and its concerns. By arguing that we were seemingly in the best of all possible worlds, it did not speak adequately to the needs of those who saw economic misery all around them. Worse still, while showing the power of markets, it seemed to argue that socialism could work: Market socialism could make use of markets, and yet the economy be spared the worst features of capitalism.

That this conclusion was wrong seems by now apparent. But why it is wrong is instructive. It tells us something about both the economy and the models we have used to study capitalism. A major objective of these lectures is telling that story.

It will come as no surprise to those who have followed my work that I see the critical failing in the standard neoclassical model to be in its assumptions concerning information. In my earlier work on the economics of information, I had shown that slight perturbations in the standard information assumptions drastically changed all the major results of standard neoclassical theory: The theory was simply not robust at all.

It is my hope that these lectures go beyond the by now familiar carping with the standard model, to show how the new information theoretic paradigm can provide new insights into the theoretical issues of how the economy functions—for instance, the role of competition and decentralization—and into the policy prescriptions for the practical issues facing the economies in transition. I should emphasize, however, that while it is the informational assumptions underlying the standard theory which are perhaps its Achilles heel, its failures go well beyond that: The assumptions concerning completeness of markets, competitiveness of markets, and the absence of innovation are three that I stress.

The construction of a new paradigm is a slow process. What I have called the standard theory has been repeatedly refined over the years. The theory can now be stated with great mathematical generality. Yet that greater generality does not help the relevance of the theory. The question of whether the underlying theory has anything to say about our economy does not rely at all on differentiability of the relevant functions. That so much of our profession's resources should have been devoted to refining a model that has so little to say about the economy suggests an inefficiency in the market place of ideas, which is at least as great as the inefficiency in the markets for capital and labor.

Formal mathematical models capturing some aspect of the ideas discussed in the following pages—for instance, the role of competition in

providing information, the role of decentralization in organizations where each individual has limited information, or the role of government intervention in economies with incomplete markets and imperfect information—have been developed. But it is not my intention here to review or extend those models: The interested reader can turn to the references. Rather, it has seemed to me that the function of a lecture series such as this is to put into perspective a set of ideas. If I have succeeded in raising doubts about the reigning paradigm, if I have persuaded the reader that there is an alternative paradigm worth pursuing, and if, on that account, there is a slight reallocation of our profession's intellectual resources, then I will have accomplished my purpose. If the lectures prove helpful to those in the process of transition, if not in providing answers, at least in helping to frame the discussion, then I will be even more pleased.

I owe a great debt to my students, colleagues, and, in particular, coauthors with whom I have discussed many of the ideas in this book over the past two decades. The influences of Richard Arnott, Avi Braverman, Partha Dasgupta, Bruce Greenwald, Michael Rothschild, Barry Nalebuff, Steve Salop, David Sappington, Carl Shapiro, and Andrew Weiss should be particularly evident. Research assistance was provided by Joshua Gans and Michael Smart. Their insightful comments have greatly improved the final manuscript. Jean Koentop and Linda Handelman did their usual excellent secretarial jobs, editing the manuscript as they typed.

I have benefited too from the many comments of colleagues who attended the lectures in Stockholm and colleagues who participated in seminars in Budapest, Prague, and Rome, at which versions of various chapters were presented. My interest in the problems of socialism goes back to graduate student days, when I made an expedition to the Central School of Statistics in Warsaw to talk with Lange and Kalecki and their disciples. I gained many insights into the theory and practice of socialism, and I greatly appreciated their gracious hospitality. My interest in the problems of transition was first piqued in 1981, at a meeting sponsored by the National Academy of Sciences and the Chinese Academy of Social Sciences in Wingspreads, Wisconsin (at which I presented an early version of one of the chapters of this book), and a return visit in Beijing the following summer. Since then, I have had the good fortune to make several visits to Hungary, Czechoslovakia, Romania, Russia, and China, but I cannot claim, on the basis of these quick glimpses, to be an expert on the host of problems that these countries face. I hope, and believe, that the theoretical insights may be of some value.

I would like to acknowledge the assistance of several organizations that have provided financial support and facilitated the research that lies behind these lectures: the National Science Foundation, the Sloan Foundation, the Hoover Institution at Stanford University, the Government of Romania, the Institute for Policy Reform, the Ministry of Finance of the People's Republic of China, and the World Bank. Most important, I would like to acknowledge the support of Stanford University, which has created an atmosphere in which active discussion of the most fundamental ideas is carried out in an open and vigorous manner and which has provided me with colleagues and students from whom I learn so much every day.

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Preface

This book expands on the Wicksell Lectures I presented at the Stockholm School of Economics in April 1990. I had originally planned to present an overview of the current state of the economics of information, the focus of much of my research during the past two decades. But the events in Eastern Europe—the collapse of socialism at a wholly unanticipated rate—raised new policy questions and revived old theoretical issues: How was the transition to a market economy to be effected? What did these experiences have to say about the long-standing debate concerning the choice of alternative economic systems?

These questions were related to a third: What did conventional economic models have to say about such fundamental economic issues? The conclusion that I reached went beyond the critique that the standard models had little to say about these questions. It seemed to me that the standard models were partly to blame for the disastrous situation in which so many Eastern European countries found themselves. In an oft-quoted passage, Keynes wrote

The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back. I am sure that the power of vested interests is vastly exaggerated compared with the gradual encroachment of ideas.

A strong case could be made for the proposition that ideas about economics had led close to half the world's population to untold suffering.

Neoclassical economics often set itself up in contradistinction to Marxian economics. But neoclassical economics, at least in the version that became popular within the Anglo-American community, did not really provide a

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The Theory of Socialism and the Power of Economic Ideas

We have come to learn in this century of the power of economic ideas. It is not just in the debating halls of academe that rival views of how society should organize itself have been contested but on the battlefields of Korea, Vietnam, Afghanistan, and Central America. To be sure, in each case, more than just economic ideologies were at stake. The guerrillas in Vietnam or Honduras would not have cared about, even if they had understood, the debates over the labor theory of value or other tenets of Marxian economics. Still *beliefs* in an alternative economic system that held promise of a better life in this world held sway over their actions no less than beliefs in alternative religious systems—as holding out the promise of eternal salvation in the next world—held sway over those who fought so fiercely in the religious battles in the aftermath of the Reformation. Those beliefs have been dealt a hard blow by the events in Eastern Europe during the past couple of years, particularly with the collapse of the Soviet government within the last year.

But if we were to seek a date at which socialism ceased to be viewed as a viable alternative to capitalism, we have to look before the emancipation of the Eastern European countries in 1989. Besides, their rejection of socialism was as much a political statement, a rejection of an economic system that had been forced upon them by an occupier, as it was a statement about the virtues of that ideology. We must look, I think, to the privatizations within France beginning in the early 1980s, by an avowedly socialist government, reversing a pattern of nationalization which that government had instituted but a few short years before. There were inklings that the faith in the socialist ideology may have been crumbling in the years before: Greek Prime Minister Andreas Papandreou, another avowed socialist, took as one of the main goals of his government the “socialization of the nationalized enterprises,” recognizing explicitly that the older view, that nationalizing an enterprise would ensure that the goals of the enterprise would be

coincident with “national interest,” however that was defined, had no basis in reality, at least in the context of Greece. The collapse of socialism as an economic ideology was as remarkable in many ways as the almost contemporaneous collapse of the Soviet bloc, representing the culmination of an economic experiment of a half-century’s duration. It was an experiment that was conducted with considerable forethought, based as it was on an ideology of more than a century’s standing. The ideology had withstood the scrutiny of time. Its premises and conclusions had been widely debated, and it included among its adherents some of the greatest minds over a period of more than a hundred years. Even today the Marxist ideas and ideals that underlay the economic ideology remain alive, not only within the third world but in other disciplines. A full and coherent account of the rise, persistence, and partial fall of this set of beliefs would be fascinating but would take me beyond the scope of these lectures. But one of the themes that I do hope to develop is that, indirectly and unintentionally, neoclassical models of the economy played a central role in promulgating and perpetuating a belief in market socialism—one of the central variants of the socialist model—as an alternative to capitalism. I argue in these lectures that if the neoclassical model (or its precursors) had provided a correct description of the economy, then market socialism would indeed have had a running chance of success. Thus the failure of market socialism serves as much as a refutation of the standard neoclassical model as it does of the market socialist ideal. In these lectures I attempt to explain more precisely what is wrong with that model and to provide the basic ingredients of an alternative paradigm.

By most accounts the results of the experiment with socialism are unambiguous: The experiment was a failure. Like most social experiments it was not a controlled experiment, so there is controversy about exactly what inferences are to be made—to what extent were the basic ideas (if not the ideals) of socialism at fault and to what extent were the failures attributable to the manner in which the ideas were implemented, to what may be referred to as “specific design features”?¹

The repressive political system that accompanied the socialist experiment is also sometimes blamed: *Democratic* market socialism has never really been tried. But a case can also be made that the social experiment was more successful than it would have been in the absence of Communist oppression: for, at least to some extent, the repressive political system provided a substitute—the stick—for the absence of the carrot of economic incentives. There is a corresponding issue of whether there is a causal link between the oppressive political system and the socialist economic

system. If not the inevitable consequence of giving the state a monopoly in the ownership of the means of production, there may still be a “tendency” for the concentration of power in one sphere to lead to a concentration of power in the other.

While academicians may speculate about these matters, most of the countries involved seem resolved to move toward a market economy. They see the prosperity of the countries of Western Europe, North America, and East Asia, and they hope that by emulating their economic system, they too will experience similar prosperity. They face a difficult transition problem—how to go from where they are today to where they want to be. While there is considerable conviction that they want the fruits of a market economy, there may not be the same conviction that they want either the cost—the extremes of poverty that characterize most of the poorer of the market economies, among which many of these countries surely must be counted²—or that they are willing to bear the costs of transition. Finally, market economies come in a variety of hues and shades. The socialist economies face a difficult set of problems in deciding which form they wish to take. Indeed not all of the former socialist countries are fully committed to having market economies. Some are discussing a third way, but critics dismiss it as impossible—as the matter is commonly put, you can’t be a little bit pregnant.

For economic theorists the problems facing the socialist economies represent a challenge. Here we have a set of countries embarking on the choice of an economic system. Surely economic theory should provide considerable guidance. Regrettably economic science—at least until recently—has had very little to say about these fundamental matters, and even less to say about the important issues of transition. The typical advice of the visiting consultant making a hurried trip to one of the economies embarking on a transition path is to emphasize repeatedly the importance of markets, a lesson seemingly by now well learned (though market advocates would say that it is a lesson that cannot be repeated too often and, as simple as it may seem, the full import of which seems difficult to absorb—even in economies long accustomed to markets). Indeed there seems to be a certain instant attraction between the old ideologies of the left and the ideologies of the right. Both are driven by religious fervor, not rational analysis. As many of the ideologies have rejected the Marxian ideology, they have adopted the ideology of free markets. There is a joke that Milton Friedman is the most widely respected economist within the Soviet Union—though his books and articles have yet to be read. He is a symbol of an ideology, and it is an alternative belief system that they seek.

Of course there is much in the way of anecdotal evidence—the fact that market economies have done well is constantly recited. Anecdotal evidence—while surely better than no evidence—is a weak reed upon which to base a choice of an economic system. Anecdotal evidence of fifteen years ago led many textbook writers (including Paul Samuelson) to suggest that there might be a trade-off between freedom and growth—that the socialist economies were in fact growing faster than market economies. Popular discussions of the time suggested that democracy and freedom might be luxuries that only the rich could afford. Those that were committed to growing rapidly might have to choose the socialist path, even if there seemed to be a correlation (necessary or not) between that and the loss of freedom. Even countries that did not adopt the full rigors of the Soviet model were persuaded that certain of its features—central planning, heavy industrialization, public ownership of the basic means of production, high rates of forced savings—were important ingredients in any successful development program. Today—in historical perspective a scant few years later—all of these empirical judgments are being questioned. (Of course there are a number of economists who never wavered in their belief in markets, who are now saying “I told you so.” But some of these may be more akin to security market analysts who are always predicting bear markets or bull markets. Their day in the sun eventually comes, but this should not be attributed either to their acumen or the rigorlessness of their analysis.) Moreover the anecdotal evidence is far from unambiguous concerning what course of action these countries should take: One commonly held interpretation of the Asian miracle—the rapid growth of Japan, Korea, Singapore, and Taiwan—is that government played a crucial role in “governing the market.”³

When I ask, “Does economic science have much to contribute to these discussions?” I mean more than the recitation of anecdotal evidence and the repetition of economists’ faith in markets: Are there “theorems” that tell us that market economies will necessarily do better than socialist economies, or that privatization will improve the efficiency of state enterprises? Are there analytical results that tell us something about the appropriate balance and role of government and the private sector—for virtually all of the success stories involve mixed economies with large governments. Transitioning to a market economy does not entail a withering away of the state but a redefinition of its role. What guidance does economic science have to offer on these matters?

For the past half-century a simple paradigm has dominated the economics profession—variously referred to as the *competitive paradigm*, or the

neoclassical or Walrasian model. The most precise statement of that paradigm is provided by the model of Arrow and Debreu (1954; see also Arrow 1951b; Debreu 1959). It postulates large numbers of profit- (or value-) maximizing firms interacting with rational, utility-maximizing consumers in an economy in which there is a complete set of perfectly competitive markets—for all goods, in all periods, in all states of nature (for all risks), at all locations. Most who claim that the model has much to say about the real world believe that its conclusions are robust to weakening the precise assumptions employed by Arrow and Debreu (e.g., with respect to the completeness of markets).

I want to argue in these lectures that the competitive paradigm not only did not provide much guidance on the vital question of the choice of economic systems but what “advice” it did provide was often misguided. The conceptions of the market that underlay that analysis mischaracterized it; the standard analyses underestimated the strengths—and weaknesses—of market economies, and accordingly provided wrong signals for the potential success of alternatives and for how the market might be improved upon. By the same token, that paradigm cannot be relied upon to provide guidance to the former socialist economies as they seek to build new economic systems.

The fundamental problem with the neoclassical model and the corresponding model underlying market socialism⁴ is that they fail to take into account a variety of problems that arise from the absence of perfect information and the costs of acquiring information, as well as the absence or imperfections in certain key risk and capital markets. The absence or imperfections of these markets can, in turn, to a large extent be explained by problems of information. During the past fifteen years, a new paradigm, sometimes referred to as the information-theoretic approach to economics (or, for short, *information paradigm*),⁵ has developed. This paradigm is explicitly concerned with these issues.⁶ This paradigm has already provided us insights into development economics⁷ and macroeconomics.⁸ It has provided us a *new welfare economics*,⁹ a *new theory of the firm*,¹⁰ and a new understanding of the role and functioning of financial markets. It has provided us new insights concerning traditional questions, such as the design of incentive structures.

These information-theoretic concerns have not only enriched and changed the answers to traditional economic questions; they have led to new questions being posed. To the classical three questions of economics—what should be produced, how should it be produced, and for whom should it be produced—we now add a fourth—how should these

The Fundamental Theorems of Welfare Economics and Adam Smith's Invisible Hand

First, there were the fundamental theorems of welfare economics (Arrow 1951b; Debreu 1959), the formalization of Adam Smith's famous invisible hand argument. Smith argued that not only are individuals led through the pursuit of their self-interest by an invisible hand to pursue the nation's interest, but this pursuit of self-interest is a far more reliable way to ensure that the public interest will be served than any alternative—surely better than relying on some government leader, as well-intentioned as that leader might be. Smith's argument provides the basis for the reliance on market economies.

The fundamental theorems of welfare economics made precise the sense in which and the conditions under which markets are efficient. What is generally referred to as the first fundamental theorem of welfare economics shows that under certain conditions every competitive equilibrium is Pareto efficient—that is, no one can be made better off without making someone worse off. What is generally referred to as the second fundamental theorem of welfare economics provides conditions under which any Pareto-efficient allocation of resources can be obtained through market mechanisms. The fundamental theorems of welfare economics form the basis of the “market failures” approach to government intervention.¹³ Markets do not work perfectly when there are important externalities, and hence the rationale for pollution taxes. Markets cannot provide public goods, and hence the rationale for public expenditures on roads, defense, and other public works. The market distribution of income might not be socially desirable, and hence the rationale for government redistribution programs.

The market failures approach argues that there is indeed a role for government, but it is a limited role: Government simply needs to correct the well-defined market failures, which it can do with simple tools having minimal effects on the mode of operation of the market economy. For instance, problems of externalities can be addressed through corrective (Pigouvian) taxes. Even when the government is uncertain of the tax rate that will achieve particular pollution control objectives, market mechanisms can be employed: The government can issue marketable pollution permits.¹⁴ To be sure, the government has further, limited responsibilities: It has to provide public goods and to levy taxes to finance them. It might also have to take actions to ensure that markets are actually competitive. The second fundamental theorem of welfare economics further delineated the

decisions be made, and who should make them. In the economy of Joan Robinson (or Arrow and Debreu), decision makers, and the structure of decision making, play no role. Joan Robinson described the job of the manager of a firm as simply looking up in the book of blueprints the appropriate page corresponding to current (and future) factor prices. That page would show what technology minimized costs at those factor prices. Were life so simple! Of course, if life were so simple, being a manager would be a truly boring job, worthy of the disdain cast by the traditional British academic, and the lack of concern of Lange, Lerner, and Taylor for managerial incentives would be of little moment: They could essentially be replaced by automata.

In summary, in this book I want to show how the perspectives of the new information paradigm can provide at least some limited insights into the basic issues facing the former socialist economies. Beyond that I want to address some basic, long-standing issues in the theory of economic organization: I want to argue that much of the older debate about the desirability of market socialism was misguided; it was based on an incorrect understanding of how competitive markets work, a misunderstanding to which the Walrasian model may have contributed in no small measure. (The Austrians, I believe, sensed this, and they strove to create an alternative vision of the market economy. But they never succeeded in articulating and formalizing their views in a way that was entirely satisfactory as a coherent alternative to the Walrasian paradigm, and accordingly, apart from occasional footnote references, they have remained outside the mainstream, at least the American/Western European mainstream. I will have more to say about the relationship between the ideas presented here and the Austrian tradition later in this book.¹¹)

After explaining the limitations of the earlier theories and debates, I will attempt to articulate what I see as the basic issues, the insights that can be gleaned from what we have learned in the past fifteen years, and the questions that remain to be resolved. I will close this book with some remarks attempting to apply the lessons learned to the problems of transition facing the Eastern European countries.¹²

The Traditional Results on Comparative Economic Systems

As of perhaps ten or fifteen years ago economic science has had three sets of results to guide those wishing to choose among alternative economic systems.

limited role of government: Even if the distribution of income was unsatisfactory, only limited government intervention was called for. “All” the government had to do was redistribute initial endowments (wealth) in a lump-sum (nondistortionary) manner.

Behind both theorems was the notion that the price system provided a powerful instrument for allocating resources. Textbook expositions of the power of the price system often went beyond the ideas reflected in the fundamental theorems of welfare economics, to talk about the “informational efficiency” of the market economy and the price system. No one has to know fully the preferences of individuals, the technologies of production, and the availability of resources. No one even needs to know how to make as simple a commodity as a pencil. Prices convey information about the scarcity of resources. They convey information from households to firms concerning what consumers want, and from firms to households about the resource costs associated with consuming each commodity. The price system ensures that the economy produces the commodities that individuals want.

While advocates of the market economy often waxed poetic about its beauties and powers, the theorems that underlay the rhetoric actually had little to say about “information.” The theorems did not, for instance, discuss how well the economy processed new information—indeed, in their models, there was not a flow of new information—nor whether it was efficient in its allocation of resources to the acquisition of information that was relevant to the allocation of resources. It did not even recognize the conflict between the efficiency with which the economy transmits information and knowledge and the incentives that are present for the acquiring of information and knowledge: If, say, stock market prices perfectly and instantaneously transmitted information, then no investor would ever have any incentive to acquire information. Stock markets must be characterized by imperfect information, so long as information is costly. There is, as Grossman and Stiglitz (1976, 1980a) put it, “an equilibrium amount of disequilibrium.” But the fundamental theorems of welfare economics have absolutely nothing to say about whether that equilibrium amount of disequilibrium is in any sense efficient. Are, for instance, the expenditures on information acquisition and dissemination too little, too much, or just right?

By the same token, for inventors or innovators to obtain a return on their inventive activities, there cannot be a free dissemination of technological knowledge. As my discussion below will emphasize, the informational problems that the competitive market economy handles efficiently are extremely limited.

The Lange-Lerner-Taylor Theorem

The second set of results is sometimes referred to as the Lange-Lerner-Taylor theorem. It is concerned with establishing the equivalence between two alternative institutional arrangements for the economy; it asserts the equivalence between market economies and “market socialism.”

Market socialism refers to a form of economic organization where the government owns the means of production (as under any socialist system) but uses prices in much the same way that market economies do to allocate resources. Under market socialism managers are instructed to maximize profits, just as managers under capitalism maximize profits. Prices are set so that demands are equal to supplies.

The principal differences between market economies and market socialism are the mechanisms by which prices are set and the ownership of capital. For price setting under market socialism, a government planning agency replaces the to-and-fro of the market place or the mythical Walrasian auctioneer.¹⁵ The fact that capital is owned by the government means that rather than shareholders receiving dividend checks (representing the “profits” of the firm), the dividends are sent to the government.

A corollary of government ownership of capital is that the government has to assume responsibility for allocating capital. In most renditions of market socialism the government does not do this by a balancing of supply and demand (in the manner in which other goods are allocated) but rather by a more direct allocative mechanism.¹⁶ But if the government allocates capital in exactly the same way that private firms would allocate it, then the resource allocations emerging from the two systems would be identical.

The idea of market socialism was a powerful one. It suggested that it was possible to have all the advantages of market economies without the disadvantages attendant to private property and the frequently associated large concentrations of wealth. Market socialism, it was thought, could at the same time avoid the major pitfalls facing Soviet-type socialism. This required that essentially all of the information about technology¹⁷ had to be communicated to the central planner, who had to make millions of decisions concerning what goods were to be produced and how they were to be produced. The central planner would have to decide what goods each factory should produce, whence it should receive its inputs, and where it should ship its output. Hayek had rightly criticized this view, arguing that the central planner could never have the requisite information. Market socialism seemed to suggest that the central planner does not need to have all of the detailed information—apart from his or her role in allocating

investment, the central planner does nothing more than the Walrasian auctioneer, an important actor in conventional expositions of competitive economies. The fundamental theorems of welfare economics enhanced the power of market socialism: The second fundamental theorem assures us that the government can, through market socialism, attain any Pareto-efficient outcome.

During the past decade Hungary and a number of other countries have tried to follow a path of market socialism (or at least what they view as an adaptation of that model) with quite limited success.¹⁸ The seeming failures of that approach led to two reactions. Among some, at least for a while, there was a desire to return to nonmarket systems; among the majority, a desire to travel farther along the road to markets. Among almost all, there are growing doubts about the viability of the kind of third road represented by market socialism.

To what should we attribute the failure of market socialism? The Lerner-Taylor theorem, when combined with the fundamental theorems of welfare economics, suggests that the economy should be able to obtain any Pareto-efficient outcome. What more could one want out of life, or at least out of the economy?

On Centrally Planned Economies and the Neoclassical Paradigm

Though in this book I will concentrate on the comparison between markets and market socialism, rather than, for instance, the comparison between markets and centrally planned economies, it should be clear that many of the issues that I raise here apply to that comparison as well. One of my arguments will be that if the neoclassical model of the economy were correct, market socialism would have been a success; by the same token, if the neoclassical model of the economy were correct, centrally planned socialism would have run into far fewer problems than it had encountered. Samuelson described the economy as the solution to a maximization problem; the fundamental theorem of welfare economics showed that under strong assumptions his insight was correct.¹⁹ In addition mathematical techniques, like linear programming, combined with high-speed computers, suggest that it is possible to “solve” directly for the efficient allocations of resources. As I noted above, the Arrow-Debreu model suggests that competitive markets are an efficient algorithm for “solving” the economy’s resource allocation problem, but these new techniques and technologies suggested that we could dispense with that algorithm—thereby dispensing with all the problems associated with the market mechanism—and still

obtain solutions to the problem of how society’s resources should be efficiently allocated.²⁰

(It is perhaps worth noting that while earlier work on algorithms for solving complicated maximization problems suggests that those that involved “prices” [using duality] and “decentralization”—seeming analogues to the way that markets solve the resource allocation problem—were efficient, more recent work has produced more efficient algorithms that do not seem to have any direct market analogue. This supports my view that what is at issue in the analysis of how the economy allocates its resources is more than just the solution to a complicated maximization problem: economics is far more complicated, and more interesting, than the engineering approach that prevailed in the decades following Samuelson’s *Foundations of Economic Analysis*.)²¹

Coase’s Theorem (or Conjecture)

The final set of ideas is commonly referred to as Coase’s theorem (though it was never stated in a precise enough form really to merit that appellation). Coase emphasized the importance of property rights. According to Coase, if property rights are assigned clearly, individuals have an incentive to work out efficient economic arrangements. It does not matter so much who gets the property rights (this affected, of course, the distribution of welfare) as that someone does. Inefficiencies such as the “Tragedy of the Commons”—the excessive grazing on common land, excessively rapid drilling of common oil pools, excessive fishing in international waters—are the result of failure to assign property rights. Other inefficiencies arise out of circumscribing property rights: The failure to allow water rights to be sold led to misallocation of water in the western part of the United States.

Socialist economies thought of themselves as destroying many private property rights, and many of the failures of socialism are attributed to that: The residents of apartments did not have the incentive to maintain their apartments, because they could not appropriate any returns from those activities by selling their apartments (just as cities with rent control face similar problems).²² Managers of state-owned enterprises have inadequate incentives to enhance the value of the enterprises under their charge; unlike the owners of enterprises, they cannot reap the full benefits of their efforts.

From our current perspective the socialist economies were less successful in abolishing private property rights than they might have thought; for managers had considerable discretion in allocating the (often underpriced) output (often in return for similar favors from other managers). Jobs from

which an individual cannot be fired can similarly be viewed as “property rights.” Of course these were restricted property rights: The worker, for instance, could not sell his job to another worker. And because property rights were restricted, a variety of distortions arose. The Coase perspective has a clear prescription: Market socialism, like any other form of socialism, is doomed, simply because ownership rights in property are not well defined. When property is owned by everyone, it is in fact owned by no one; no one has the appropriate incentives. In this perspective, then, the first task in the transition to the market economy is privatization of the state property.

While the argument that the absence of well-defined private property rights, or restrictions on property rights, frequently gives rise to distortions is correct, the other fundamental conclusions are not. First, the clear assignment of property rights does not necessarily lead to efficiency. Public good problems, for instance,²³ are not resolved by Coase’s theorem. While Coase and his followers paid passing attention to the possibility that transactions costs might impede parties “bargaining” to an efficient outcome, in the presence of imperfect information (giving rise to what may be viewed as transactions costs), inefficient outcomes frequently arise; indeed mutually beneficial deals simply may not occur, as one party tries to convince the other that the value of the relationship to him is small, in an attempt to appropriate a larger fraction of the surplus that accrues from the relationship (see, e.g., Farrell 1987).²⁴

Second, the absence of well-defined private property rights need not give rise to problems. There is a large and growing literature showing how, in varying contexts, local communities have avoided the Tragedy of the Commons by a variety of regulatory devices.

More generally, there is some question about whether the absence of well-defined property rights is the *central* problem. There are two pieces of evidence in support of this. The first is that most large firms are not run by owners but by hired managers. The question of whether it makes much difference whether the manager works for a disparate set of shareholders, or for the state, is one to which I will return later. The second is the rapid growth in the South of China: the absence of well-defined property rights has not prevented double-digit growth rates.

Not only is it the case that the absence of private property rights may not be the central problem; it is not even clear that with privatization the government can accomplish its objectives as effectively as it can if it directly controls the enterprise. The question of whether privatization domi-

nates public control is one of the central issues to which I will turn in chapter 9. The fundamental privatization theorem discussed there suggests that it does not.

The Central Themes of These Lectures

I have now set the stage so that I can state more fully the six central themes of this book:

1. The standard neoclassical model—the formal articulation of Adam Smith’s invisible hand, the contention that market economies will ensure economic efficiency—provides little guidance for the choice of economic systems, since once information imperfections (and the fact that markets are incomplete) are brought into the analysis, as surely they must be, there is no presumption that markets are efficient.
2. The Lange-Lerner-Taylor theorem, asserting the equivalence of market and market socialist economies, is based on a misguided view of the market, of the central problems of resource allocation, and (not surprisingly, given the first two failures) of how the market addresses those basic problems.
3. The neoclassical paradigm, through its incorrect characterization of the market economies and the central problems of resource allocation, provides a false sense of belief in the ability of market socialism to solve those resource allocation problems. To put it another way, if the neoclassical paradigm had provided a good description of the resource allocation problem and the market mechanism, then market socialism might well have been a success. The very criticisms of market socialism are themselves, to a large extent, criticisms of the neoclassical paradigm.
4. The central economic issues go beyond the traditional three questions posed at the beginning of every introductory text: What is to be produced? How is it to be produced? And for whom is it to be produced? Among the broader set of questions are: How should these resource allocation decisions be made? Who should make these decisions? How can those who are responsible for making these decisions be induced to make the right decisions? How are they to know what and how much information to acquire before making the decisions? How can the separate decisions of the millions of actors—decision makers—in the economy be coordinated?
5. At the core of the success of market economies are *competition, markets, and decentralization*. It is possible to have these, and for the government to

still play a large role in the economy; indeed it may be necessary for the government to play a large role if competition is to be preserved.

There has recently been extensive confusion over to what to attribute the East Asian miracle, the amazingly rapid growth in countries of this region during the past decade or two. Countries like Korea did make use of markets; they were very export oriented. And because markets played such an important role, some observers concluded that their success was convincing evidence of the power of markets *alone*. Yet in almost every case, government played a major role in these economies. While Wade may have put it too strongly when he entitled his book on the Taiwan success *Governing the Market*, there is little doubt that government intervened in the economy *through* the market.

6. At the core of the failure of the socialist experiment is not just the lack of property rights. Equally important were the problems arising from lack of incentives and competition, not only in the sphere of economics but also in politics. Even more important perhaps were problems of information. Hayek was right, of course, in emphasizing that the information problems facing a central planner were overwhelming. I am not sure that Hayek fully appreciated the range of information problems. If they were limited to the kinds of information problems that are at the center of the Arrow-Debreu model—consumers conveying their preferences to firms, and scarcity values being communicated both to firms and consumers—then market socialism would have worked. Lange would have been correct that by using prices, the socialist economy could “solve” the information problem just as well as the market could. But problems of information are broader.

2 The Debate over Market Socialism: A First Approach

The debate over socialism in general, and market socialism in particular, has had a long and noble history, with notable contributions in the 1930s by Lange, Lerner, and Taylor, on the one side, and Hayek, on the other. There were many strands to this debate. Some have been lost in more recent discussions, while others have received greater stress.

For instance, modern discussions emphasize the unrealism of market socialism arising from its failure to take into account the political economy problems: Do bureaucrats have the incentives to carry out the prescriptions provided by the advocates of market socialism? Thus critics of market socialism argue that the relevant comparison is not between the idealized government postulated by the socialists and the market economy, but between how the economy would perform under actual government control and the market economy. But older discussions emphasized the unreality of the competitive model of the economy: Given the pervasiveness of increasing returns, the relevant comparison was not between market socialism and competitive markets, but between market socialism and monopoly capitalism.

Much has happened in the world—and in economic theory—in the more than fifty years since those great debates occurred. Not only has the vocabulary economists use been changed, but there have, I believe, been marked advances in economic science that allow us to reexamine these old questions from new perspectives. Looking at these questions from the perspective of the new information paradigm is, as I have said, the central objective of this book. But before embarking on a detailed development of my arguments, I want to provide a broader sketch of how recent advances in economics enter into the old debates. Ironically some of these advances have breathed new life into the argument for market socialism—just as the economies that had been trying market socialism are in the process of abandoning it. At the same time some of these advances have raised new questions concerning both the necessity and viability of market socialism.

Why Modern Theory Might Suggest a Greater Plausibility for Market Socialism¹

At least two of the central results of modern economic theory should, if anything, have reinforced the belief in market socialism.

Absence of Futures Markets and the Role of Government in Allocating Investment

It should be obvious that if market economies are to function in the way its advocates claim, markets in which goods and services can be traded must exist. One of the underlying assumptions in the by now standard model of (competitive) market economies—the model that seemingly provides the intellectual foundations of whatever belief one has in the market economy—is that there is a complete set of markets. This is a stronger assumption than might appear at first glance. To be sure, there are “markets” for steel, for labor, for land, for stocks, for wheat; while these markets may not be “perfect”—there may not be the large number of buyers and sellers in each of these markets envisaged by the competitive model—and most of these markets may not be organized in the way envisaged by the standard theory, with an auctioneer calling out prices until the market-clearing level is attained, still there is a general consensus that the economists’ basic market model provides a good approximation at least for many of these goods and services.

But the assumption that there is a *complete* set of markets goes beyond this. There must exist markets on which not only today’s goods and services are traded but on which future goods and services are traded.² There are of course some future markets: One can buy corn or wheat for delivery three or six months hence. But for most goods and services (beyond a few agricultural commodities, for a few months into the future) there do not exist markets where one can trade today for future delivery.

These futures markets are essential for making the correct investment allocations. Concern about the market economy’s ability to allocate and coordinate investment in a socially productive way of course underlay many of the calls for socialism in both this and the previous century. Without the requisite markets there are no prices to perform the coordinating/information roles that are essential if a market economy is to be efficient. Each firm must form expectations concerning what prices in the future are going to be, and those expectations are based, in part, on its beliefs about what other firms are doing. Other firms go to great efforts to keep that

information secret. Thus, rather than there being a mechanism for coordinating investment decisions, market economies seem to provide incentives that provide obstacles to coordination. There are many real-world manifestations of this failure: At times there may be excessive entry into an industry, at other times shortages develop. Indeed even government attempts at limited intervention to provide the requisite information through indicative planning³ (as in France) seem to have failed, as firms seem to have lacked the necessary incentives to reveal truthfully their plans (and in many cases may have had strategic incentives to provide other than truthful information).

There must exist markets not only for periods in the immediate future but for *all* periods extending *infinitely* far into the future. Without a complete set of futures markets extending infinitely far into the future, the economy can set off on a path that is locally intertemporally efficient—it looks exactly like an ordinary rational expectations path, with the real returns (capital gains plus rents) on all assets being equal—and only in the distant future does it become evident that the economy is inefficient. There appear to be no private incentives to correct this potential for seeming long-run inefficiency. The intuition behind this result is simple. Consider a firm, in 1990, contemplating building a factory, which it plans to use for twenty years, and then sell to some other firm. To make its decision, it must form an estimate of the value of the building at the end of twenty years, that is, in the year 2010. But the value of that building at the end of twenty years will depend, in part, on the supply of other buildings constructed between now and twenty years hence. Even those decisions will depend on expectations concerning what will happen still further in the future. Consider, for instance, a building being considered for construction ten years hence, that is, in the year 2000. Its owners will want to know what they can sell their building for, say, twenty years after construction, that is, in the year 2020. The value of a building in the year 2020 will depend on the supply of buildings at that date, which in turn will depend on the levels of construction between now and the year 2020. Now consider a building being contemplated for construction in the year 2010. Its owners will want to know the value of buildings in the year 2030, and so on. Thus decisions today are inextricably linked to what goes on in a web of interconnections extending onward forever. In practice firms do not go through this complicated process of reasoning. Business managers base their decisions on hunches and guesses. The point of the theoretical argument is just this: Even under the best of conditions, with business managers engaging in the most rational analyses, in the absence of markets extending infinitely far

into the future, there is no assurance that markets lead to efficient outcomes. Surely, if business managers short-circuit this, by engaging in less sophisticated calculations, our confidence in the efficiency of the market outcome should be even further weakened.

Long-Run Dynamics: A Technical Digression

It has long been recognized that the dynamics of optimization models generates saddle point paths (e.g., Samuelson and Solow 1953); that is, with “well-behaved” problems, there is a unique path, starting from any set of initial conditions, satisfying the intertemporal efficiency conditions that converge to the steady state. All other paths satisfying the intertemporal efficiency conditions diverge. Still this was not a serious economic problem; there was always a further condition, the transversality condition, which had to be satisfied along an optimal path, and this transversality condition ensured convergence to the steady state. Hahn (1966) showed that similar problems arise if there are more than one capital good in a *descriptive* model of the economy. But, he argued, there is, in the absence of futures markets extending infinitely far into the future, no way to ensure that market economies converge to the steady state. The subsequent literature (Shell and Stiglitz 1967) showed that the instability of the economy can be eliminated if the assumption of perfect foresight (rational expectations) is replaced with other assumptions concerning expectations, such as adaptive expectations, with sufficiently slow speeds of adaptation. It was also shown that other specifications of the economy can result in the equilibrium being a stable node; for instance, in a model of money and growth, Shell et al. (1969) showed that from any initial value of the capital stock and nominal money supply, there are many paths that converge to the same steady state. Other studies (Stiglitz 1973a) showed that there are rational expectations equilibria that, while they do not converge to a unique steady state, also did not “explode.” Indeed he showed that there can be a multiplicity of nonconvergent paths consistent with rational expectations.

It is curious how the same analytical results can be interpreted in different ways. The early workers in this field (Samuelson 1967; Hahn 1966; Shell, Sidrauski, and Stiglitz 1969) thought that the saddle point equilibria present a problem for the capitalist economy, for in the absence of futures markets extending infinitely far into the future, there is no way to ensure that the economy will choose the unique path converging to the steady state. To be sure, the existence of a multiplicity of equilibria (illustrated by the case where many paths converge to the steady state) presents a prob-

lem: First, the economist may not be able to predict which of the paths the economy will choose; and second, some of these paths may be “better,” in some sense, than others, and there is no assurance that the economy will pick out the better one. But these economists were more concerned with the problem of economic instability, and the obvious inefficiency that may result (and may be very large), than with the perhaps small differences in welfare associated with the choice of one rather than another of the convergent paths.

By contrast, in the recent rational expectations literature, saddle points are viewed as good, and nodes as bad. Those in the rational expectations school wanted to show that the market economy is efficient. By showing that there is a unique path satisfying the rational expectations conditions—if they could establish that (1) that unique path is the “socially optimal” path, and (2) the economy always behaves consistently with rational expectations—then they claim to have established that the market economy is efficient. In contrast, with nodes, there are many paths starting from any initial condition. How can one tell which path the economy will follow? And since not all of these paths will be Pareto efficient, nodes raise the possibility that the economy will follow an inefficient trajectory.

It is noteworthy that each of the hypotheses underlying the rational expectations analysis is questionable. Thus not only may there not be a unique rational expectations equilibrium but, except under strong conditions, the rational expectations equilibrium may not be Pareto efficient, as I will show in the next chapter. But most important for our current purposes, there is no reason to believe that without futures markets extending infinitely far into the future, even if there is a unique path converging to the steady state, the market economy will “choose” that path. The contention by those attempting to claim that the market economy (with rational expectations) is efficient, and will accordingly move along the (unique) path converging to the steady state, is not based on a resolution of the problems that Hahn and others had raised. These problems were simply ignored. It was *assumed* that the economy acted as if there were a single individual maximizing his or her utility over an infinite lifetime. The individual would ensure that the transversality condition would be satisfied—and so too, it was *asserted*, would the economy. The fact that futures markets extending infinitely far into the future were required was simply ignored.

In short, whether for the obvious reason that in the absence of futures markets the price system cannot perform its essential coordinating role with respect to future-oriented activities, such as investments, or for the more subtle reasons just discussed, that in the absence of futures markets,