

VALUE AND EXCHANGE

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Economics is at a crucial juncture. The research program that has guided economic theory for some six decades is at an impasse, and a new and different research program is emerging. The new program grows out of a very different vision of the economic process. This vision suggests a very different type of economic theory offering a different explanation of how the economy works and different policy advice. The implications for the future of economic research and for the conduct of economic policy could not be greater. The purpose of this article is to explain this momentous change and to explore its likely consequences.

The Impasse in Economic Theory

To understand the current difficulties of economic theory, we need to understand the goals of the research program that guides it. That program has its origins in the work of two great economists—Paul Samuelson and John Hicks—and its goals grew out of theirs.

Samuelson's goal was to reformulate economic theory in the language of mathematics (Samuelson 1947). He believed that this would promote greater clarity and precision. And he hoped that mathematization would lead to a formal unification of the whole of economic theory. He believed this possible because he thought that all of economics could be formalized using essentially the same mathematical approach.

Cato Journal, Vol. 24, No. 3 (Fall 2004). Copyright © Cato Institute. All rights reserved.

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While Samuelson's goal was formal unification, Hicks's goal was substantive unification. Hicks believed that much of economics could be understood in terms of the theory of value—the part of economics that seeks to explain the pattern of relative prices in an economy and the resulting allocation of resources (Hicks 1939). The construction and refinement of the theory of value had been the principal project of economics since Ricardo, and its major components were largely in place by the time of the marginalist revolution of the 1870s. Its most ambitious formulation was the general equilibrium theory of Walras and Pareto that addressed simultaneously all of the markets of an economy and their interconnections. It was within this Walrasian framework that Hicks hoped to unify much of economic theory.¹

Samuelson's goal and Hicks's, while different, proved highly complementary. Samuelson's approach was to reformulate a piece of economic theory as a set of equations that jointly determined the economic variables of interest. It was essential to his method that this set of equations could be interpreted as describing an equilibrium of the system in question. The theory of value was especially amenable to this method because the concept of equilibrium was at its very core. Given the relative ease of mathematizing the theory of value, it was then only natural to attempt to mathematize other parts of economic theory by reformulating them as extensions of the theory of value. It turned out that advancing Hicks's goal was a natural way to advance Samuelson's.

The connection between mathematization and the theory of value was initially purely opportunistic: Samuelson himself denied any necessary connection between the two.² Over time, however, substantive unification proved to be a more powerful idea than merely formal unification. The triumph of substantive unification is nicely illustrated by the history of macroeconomic theory. The original mathematization of Keynesian theory by Hicks and Modigliani—endorsed enthusiastically by Samuelson—relied on a concept of

¹“It turns out, on investigation, that most of the problems of several variables, with which economic theory has to concern itself, are problems of the interrelation of markets. . . . What we mainly need is a technique for studying the interrelations of markets” (Hicks 1939: 2).

²“It is not to be thought that [this approach] must be restricted to the variables usually considered in price and value theory. On the contrary, one employs such constructions throughout the whole field of theoretical economics including monetary and business cycle theory, international trade, etc. . . . In fact, any sector of economic theory which cannot be cast into the mold of such a system must be regarded with suspicion as suffering from haziness” (Samuelson 1947: 9). More recently, Solow (1997) has tried to reassert the distinction, advocating mathematization (which he calls “model-building”) while disparaging Walrasian value theory (“formalist economics”).

equilibrium quite different from that of the theory of value and indeed inconsistent with it (see Kohn 1986). The equilibrium assumed by the theory of value is one in which all opportunities for mutually advantageous exchange are being realized. In contrast, equilibrium in the Keynesian sense can involve widespread involuntary unemployment—hardly a situation in which all opportunities for mutually advantageous exchange are being realized. This inconsistency with the assumptions of the theory of value—described as a “lack of microfoundations”—led to increasing discomfort among theorists with the Hicks-Modigliani model. The new classical theory of Lucas, Sargent, and Barro eventually resolved the inconsistency, but it was in effect more a repudiation of Keynesian theory than a formalization of it.

Increasingly, then, adherents of the Hicks-Samuelson research program came to see the theory of value as *being* economics: they saw the two as identical and indistinguishable.³ This view, which has come to dominate economic theory, goes far beyond the ideas of Hicks and Samuelson themselves.⁴ I will call it the *value paradigm*.⁵

The Hicks-Samuelson research program today is in trouble. Of course, in terms of its dominance of economic theory, it has been an unqualified success. The “job description” of an economic theorist today is the elaboration of mathematical models. Arguments not couched in mathematical terms are dismissed as lacking in intellectual rigor.⁶

The devotion to mathematics and the adherence to the value paradigm have not been without cost. Mathematization has promoted a kind of sterile armchair theorizing. Many theorists see little need to be acquainted with the details of real-world economies: almost exclusively, they study each others’ models.⁷ Both mathematization

³“Sometimes, indeed, it seems as though economists conceive of their subject as being concerned only with the pricing system and anything outside this is considered as no part of their business” (Coase 1994: 4).

⁴Leijonhufvud has a different but very illuminating take on the development of this view. See especially Leijonhufvud (1998) and Leijonhufvud (2004).

⁵I apologize for using “paradigm,” a term that has become a cliché. However, its use here is apt and it enables me to distinguish between the value paradigm, with which I will take exception, and the theory of value itself, which is unobjectionable and indeed a mainstay of any understanding of economic phenomena.

⁶Unfortunately, there exists in the profession an unwarranted bias toward the use of mathematics even in situations where it is unproductive or useless. One manifestation of this is the common use of the terms ‘rigorous’ or ‘analytical’ or even ‘theoretical’ as identical with ‘mathematical.’ None of these links is, of course, correct” (Jensen 1983).

⁷“There is a tendency to undervalue keen observation and shrewd generalization, virtues that are usually practiced by biologists. . . . There is a lot to be said in favor of staring at the

and the value paradigm have induced a significant narrowing of the theoretical agenda: economic phenomena that do not lend themselves to mathematical treatment or that are impossible to reconcile with the assumptions of the theory of value have become “uninteresting.”

While the costs of the Hicks-Samuelson program are clear, its benefits have been elusive. It is difficult to see the payoff to this huge intellectual effort beyond some successes in the theory of asset pricing (which really falls within the theory of value proper). In such areas as money, fluctuations, and growth, the mathematical theory of value has contributed confusion rather than illumination.⁸

Most disappointingly, the Hicks-Samuelson research program has done virtually nothing to assist in the formulation of economic policy. On the great issues of the day, it has been virtually silent. The major improvement in the management of the domestic monetary system that occurred in the 1980s was the result of trial and error on the part of practitioners: economic theory contributed virtually nothing. On transition and economic development, modern economic theory has again had nothing useful to say (see Easterly 2001). This is not to suggest that economists as individuals have made no contribution. However, their advice has relied more on economic common sense than on high theory. It is difficult to see how a 19th century economist, or even one from the 18th century, would have made a less useful policy adviser than a tooled-up modern theorist.

The failings of the Hicks-Samuelson research program have hardly gone unnoticed. The principal response of mainstream economics has been increasingly to turn away from this program in favor of an entirely different one—the application of econometric methods. While econometrics was developed originally to test or to estimate the models devised by theorists, today’s applied econometrics is largely atheoretical.⁹ Applied econometrics rather than mathematical theory

piece of reality you are studying and asking, just what is going on here? Economists who are enamored of the physics style seem to bypass that stage, to their disadvantage” (Solow 1997: 56).

⁸Szostak (1999) suggests—not facetiously—that modern economic theory should be understood as a form of modern art rather than as a scientific endeavor.

⁹“Successful empirical research has been characterized by attempts to gauge the strength of associations rather than to estimate structural parameters, verbal characterizations of how causal relations might operate rather than explicit mathematical models, and the skillful use of carefully chosen natural experiments rather than sophisticated statistical techniques to achieve identification” (Summers 1991: 130). See also Chiappori and Levitt (2003), who find that to the extent that theory does inspire recent empirical work, it is theory of a pre-Hicks-Samuelson vintage.

is today the high-status field in the best graduate schools and the one that attracts many of the best minds.¹⁰

Because the applied econometrics program is firmly empirical it has been much more fruitful.¹¹ Some interesting work has focused on an area particularly refractive to the Hicks-Samuelson approach—the causes of economic growth and development. Shleifer and Levine and their respective collaborators have used cross-country comparisons to explore the significance for growth of legal and financial institutions.¹² This work is highly suggestive, but it is ultimately limited by its atheoretical nature. Yes, financial and legal institutions matter—but why? For an answer, we need a theoretical understanding of the processes at work. More generally, as this example shows, atheoretical applied econometrics avoids the problems of economic theory but it does not solve them.

This brings us to a different response to the theoretical impasse. Instead of ignoring modern economic theory, a growing body of work has sought to repair its defects or to develop alternatives. Such work includes the new institutional economics, transactions cost economics, Austrian economics, public choice theory, law and economics, and the economics of information. Important contributors include Coase, Alchian, Buchanan, Demsetz, Jensen, Kirzner, North, Olson, Williamson, Nelson, Romer, Akerlof, Stiglitz, and many others. The literature is too vast to even attempt to summarize here.¹³ However, there are some important common themes that distinguish much of this work from the Hicks-Samuelson orthodoxy. Often it is concerned less with relative prices and allocation and more with information and institutions. Much of it focuses not on the outcome of the process of exchange but on the process itself.

I shall argue that these differences are fundamental and that they imply a different way of thinking about the economy. I will call this view the *exchange paradigm*.¹⁴ The exchange paradigm provides a framework for economic theorizing very different from that of the

¹⁰It helps that applied econometrics is no less technically challenging than mathematical theory and therefore allows for equally impressive displays of technical virtuosity.

¹¹Many of its achievements, interestingly, lie outside the traditional confines of economics. See for example, the work of Steven Levitt, a recent winner of the John Bates Clark Medal, at <http://www.src.uchicago.edu/users/levit/recentpublications.htm>.

¹²For recent surveys of this work see Demirgüç-Kunt and Levine (2001) and Shleifer, Glaeser, et al. (2003).

¹³Some useful recent summaries include Nelson and Sampat (2001), Klein (2000), Milgrom and Roberts (1992), Posner (2002), and Vaughn (1994).

¹⁴The elementary and basic approach that I suggest places 'the theory of markets' and not the 'theory of resource allocation' at center stage. . . . The theory of choice must be removed

value paradigm. The theory that results produces a very different positive economics, particularly when it comes to the process of economic growth. It also has very different normative implications. I will explore each of these in turn. While some of the new theoretical work explicitly repudiates the value paradigm and its assumptions, much of it does not. Rather it seeks to extend the value paradigm or to repair its defects by introducing new elements. I will argue that such “hybrid” theorizing is a mistake and that it leads only to confusion. I will conclude by exploring the implications of the exchange paradigm for the future direction of economic research.

The Theoretical Approaches of the Two Paradigms

Before exploring the differences, it is important to emphasize what the two theoretical approaches have in common. Both see the potential gains from exchange as being the driving force of economic activity. Both assume that individuals desire a greater command over goods and services and that they pursue this goal deliberately and intelligently—that is, both assume that individuals are “greedy” and purposive.¹⁵ They both understand economic outcomes as consequences (often unintended) of the interaction of greedy, purposive individuals. Indeed, both accept the principle of methodological individualism, namely, that economic outcomes should be explained *purely* in terms of individual behavior. This principle rules out, for example, any explanation that assumes purposive behavior on the part of classes or other aggregates.¹⁶ We shall see that almost all the differences between the two theoretical approaches stem from their very different assumptions about the *nature* of the outcome of individual interaction.

The Theoretical Approach of the Value Paradigm

The value paradigm assumes that the outcome of individual interaction is “trading equilibrium”—a situation in which all opportunities for mutually advantageous exchange are being realized. To a large

from its position of eminence in the economist’s thought processes . . . I want them to concentrate on ‘exchange’ rather than on ‘choice’” (Buchanan 1964).

¹⁵I use the term “greedy” as shorthand for “desiring a greater command over goods and services”; no pejorative connotation is intended.

¹⁶Methodological individualism is held particularly dear by the Austrian school, but its acceptance is much wider: “It is a touchstone of accepted economics that all explanations must run in terms of the actions and reactions of individuals” (Arrow 1994: 1).

extent, everything else is just a corollary of this fundamental assumption.

The assumption of trading equilibrium is an appealing one for a theory of value. If all possible opportunities for mutually advantageous exchange are being exploited, then the pattern of trading is stationary and it is possible to talk about the relative prices that support this pattern and the allocation of resources that results from it. In the absence of trading equilibrium, the pattern of trading would not be stationary and there would be no unique set of prices or allocation to discuss. Since the value paradigm considers the whole of economics to be within the domain of the theory of value, it maintains the assumption of trading equilibrium when addressing other issues, such as growth and fluctuations. The aptness of the assumption of trading equilibrium beyond the confines of the theory of value proper is less obvious.

The value paradigm's assumption of trading equilibrium largely dictates the nature of its theoretical approach. I shall discuss three aspects of this: its specification of the trading environment, its description of individual behavior, and its treatment of institutions.

The trading environment is one of price taking. This means that individuals take prices as given and that prices are the only external information that they require. Individuals will take prices as given if they lack market power—if they are so small relative to the size of the market that their individual actions have no discernible effect on prices. The assumption that price information is all that is needed is essentially equivalent to assuming that exchange is free of problems and therefore costless. There are no problems with the quality of goods and there are no problems assuring future performance when this is required (for example, in forward or contingent transactions).¹⁷

The individuals that make up the economy are households and firms. These individuals are characterized by the resources and technology that they possess. Households and firms trade their resources and employ their technology to convert goods and services into utility and profits, respectively. Individuals are maximizing: given the prices they face they are exploiting all potential gains from exchange available to them. Households consume the combination of goods they most prefer at the given prices, and producers produce the combination of goods they find most profitable.

¹⁷Recently, Makowski and Ostroy (2001) have suggested a much richer description of the trading environment that, however, remains consistent with the assumption of trading equilibrium.

Maximization is sometimes described as “rational” behavior, implying that it is what rational individuals ought to do. This is a fundamental misunderstanding. *Maximization is not a description of what individuals do; it is a description of where they are.* Maximization is a consequence of trading equilibrium: in trading equilibrium all individuals must by definition be maximizing. Maximization at the level of the individual—exploiting all available opportunities for market exchange—simply reflects trading equilibrium at the level of the economy—all available opportunities for market exchange are being exploited. If individuals are not maximizing, self-interest will dictate a change in their behavior, and this will change the pattern of trading in the economy. If so, the current pattern of trading is not a trading equilibrium.¹⁸ Maximization does not imply anything at all about the conscious behavior of individuals. As Milton Friedman (1953) argued, in trading equilibrium whatever individuals’ actual behavior it is “as if” they are maximizing.¹⁹

There is no explicit role for economic institutions in the theoretical approach of the value paradigm. Economic institutions are the organizational structures within which exchange takes place. In a trading environment characterized by price taking, there is nothing for them to do and no reason for them to exist. Some real-world institutions do make a nominal appearance in the value paradigm, but they do not function as institutions. The firm is not an institution but a maximizing individual. The market is not an institution but an abstraction—an algorithm that magically coordinates the plans of individuals. Government is not an institution either. It is either an exogenous force or yet another type of individual that in this case maximizes social utility.

These characterizations of institutions sit uncomfortably with the principle of methodological individualism. In reality, firms and governments are aggregates of many individuals, each of them greedy and purposive. However, the interaction of these individuals within firms and governments is ignored by the value paradigm and the aggregates themselves are treated as though they had motives and intelligences of their own. The characterization of the market is even more of a problem. It is seen as a disembodied spirit (sometimes

¹⁸The same argument applies to “rational” expectations: these should more correctly be called *equilibrium* expectations.

¹⁹Maximization might be, for example, the outcome of an evolutionary process: “Although individual participants may not know their cost and revenue situations, the economist can predict the consequences of higher wage rates, taxes, government policy, and so forth. Like the biologist, the economist predicts the effects of environmental changes on the surviving class of living organisms; the economist need not assume that each participant is aware of, or acts according to, his cost and demand situations” (Alchian 1950).

called the “Walrasian auctioneer”) that produces, without action by any individual, the prices that individuals take as given.²⁰

The Theoretical Approach of the Exchange Paradigm

The value paradigm begins by assuming a particular outcome of the process of exchange—trading equilibrium. As we have seen, this imposes a “top down” structure on the resulting theory; everything else is dictated by this assumption.²¹ In contrast, the exchange paradigm makes no assumption about the outcome of the process of exchange. Its theory is built instead from the “bottom up”—up from individual behavior rather than down from trading equilibrium. Consistency with the principle of methodological individualism is therefore guaranteed by construction.

Liberated from the assumption of trading equilibrium, it is possible to be more realistic about the trading environment. Exchange opportunities are not given, but must be found or created. Prices are not provided by magic, but must to be set by someone. Exchange involves interaction not with an impersonal market but with other individuals. Promises of future performance are not always kept. Goods and traders are heterogeneous, so that individuals require information not only on prices but also on the quality of goods and the trustworthiness of counterparties. Such information is scarce and often asymmetric. Individuals are not always insignificant relative to the market: markets are often thin, and prices may be set strategically or be subject to bargaining.

In this more difficult trading environment exchange is definitely not costless. This corresponds well with reality: in the United States, for example, the total outlay on exchange amounts to perhaps half of GNP (Wallis and North 1986). The “exchange sector”—invisible to the value paradigm—is in fact much larger than industry and agriculture combined.

In this trading environment individuals are characterized not only by resources and technology but also by information—the information they possess and the information that others possess about them (their reputations). Purposive behavior is much richer. Individuals

²⁰“There is still one element not individual: namely, the prices faced by the firms and individuals. What individual has chosen prices? In the formal theory, at least, no one. They are determined on (not by) social institutions known as markets, which equate supply and demand. . . . The failure to give an individualistic explanation of price formation has proved to be surprisingly hard to cure” (Arrow 1994: 4).

²¹Buchanan and Vanberg (1991) call this theoretical approach teleological (i.e., driven by the outcome).

pursue their interests not only through offers to buy or to sell, but through coercion, lying, and conspiracy. Behavior need not be atomistic: individuals can work with others to further their goals.

Clearly, individuals in this more realistic environment face decision problems far more complex than those contemplated by the value paradigm. It is not surprising therefore that observed behavior in the real world often fails to conform with the predictions of maximizing models.²² Individuals are purposive, they do their intelligent best to further their own interests, but they are not engineers solving well-defined problems of constrained optimization.²³ While we can assume that individuals will not pass up obvious opportunities for gain, most opportunities for gain are far from obvious. This makes individuals entrepreneurs rather than engineers: they identify, create, and exploit opportunities as best they can.

For the value paradigm, the assumption of trading equilibrium implies maximization and requires unchanging preferences and technology. Attempts to question maximization or to suggest that preferences or technology might be subject to change are rightly seen as subversive of the whole theoretical approach.²⁴ Since the exchange paradigm does not assume trading equilibrium, its understanding of the nature of individual behavior is not restricted in the same way. The nature of individual behavior becomes an empirical question rather than a matter of dogma. Since the exchange paradigm builds up from individual behavior rather than down from trading equilibrium, any systematic pattern of behavior will do. Indeed, economics as a discipline has no special claim to understanding the nature of individual behavior; presumably psychologists and cognitive scientists have much more to say about it.²⁵ The stock in trade of economics, rather, is its understanding of the *aggregate outcome* of individual

²²For example, there are many problems with empirical studies of individual saving behavior based on models of intertemporal optimization (see Browning and Lusardi 1996). Also, empirical studies generally find that firms are far from minimizing costs (e.g., Biema and Greenwald 1997). A substantial literature argues that faced with problems of great complexity, individuals will resort to simpler modes of behavior, relying on “rules of thumb” or “satisficing” (see, e.g., Simon 1957 and Heiner 1983).

²³“Decisionmaking proceeds in fact on quite different levels than those treated by comparing marginal costs and marginal revenues . . . The first question is: shall we produce the Edsel? When the answer (unfortunately) is yes, the next question is: How many?” (Morgenstern 1972).

²⁴For example, recent work on endogenous growth (with its origins in Romer 1986) has encountered strong resistance. While Romer initially portrayed his work as being merely a modification of the value-theoretic theory of growth, he has recently been more explicit about its subversive nature (see Romer 1994).

²⁵See, for example, Kahneman (1994) and Thaler (2000).

behavior—or more precisely, of the “unintended consequence of intended actions.” For that purpose, we are not obliged to assume individual behavior; we may ask what it actually is.

While institutions have no place in the value paradigm, they do play a natural and essential role in the exchange paradigm. There is no conflict with methodological individualism: individuals, acting alone or in concert, create institutions to further their individual or joint interests. A primary function of many economic institutions, not surprisingly, is to facilitate exchange. But institutions need not only play a positive role: they can also be used to benefit some at the expense of others. Combinations “in restraint of trade” are one example. Government as an instrument of predation or redistribution is another. Institutions are not just actors but also forums *within which* individuals pursue their own interests and interact with one another. The market is obviously such a forum, but so is the firm and government.

The Relationship between the Two Theoretical Approaches

The differences between the two theoretical approaches has its parallels in the natural sciences. In recent work, Stephen Wolfram has suggested that in the natural sciences traditional mathematical theory is limited in its applicability and has offered a more general approach that he calls a “New Kind of Science” (NKS) (Wolfram 2002).

NKS begins with the elementary units of a particular natural system and the simple rules that govern their behavior and interaction. It then aggregates up—through computer simulation—to reproduce the behavior of the system as a whole. Wolfram sees traditional mathematical theory as a shortcut for this procedure: “Most of the time the idea is to derive a mathematical formula that allows one to determine what the outcome of the evolution of the system will be without explicitly having to trace its steps” (Wolfram 2002: 737). This shortcut, however, is not always available. In many cases simple rules generate behavior that cannot be summarized with mathematical equations—behavior that Wolfram calls “computationally irreducible.” In such cases, the mathematical approach to theorizing fails not because the right equations have yet to be found but because no such equations exist in principle.²⁶

²⁶ “[The] whole idea of using mathematical formulas to describe behavior makes sense only when the behavior is computationally reducible. So when computational irreducibility is present it is inevitable that the usual methods of traditional theoretical science will not work. And indeed I suspect the only reason that their failure has not been more obvious in the past is that theoretical science has typically tended to define its domain specifically in

The theoretical approach of the value paradigm is of course modeled on traditional mathematical theory in the natural sciences. It aims to describe the outcome of the economic process (which it sees as trading equilibrium) with mathematical equations. This is a shortcut that eliminates the need to work through the details of the economic process. The focus is on the conditions for the existence of trading equilibrium and on the properties of an economy that is in trading equilibrium. In contrast, the theoretical approach of the exchange paradigm is much like that of Wolfram's NKS. It builds up from individual behavior and traces out the process of exchange and its consequences. Like NKS, it is a general approach to theorizing. The approach of the value paradigm, like that of traditional mathematical theory in the natural sciences, is a special approach that is valid only in a subset of cases.

We can be more specific if we divide the domain of economic theory according to the three basic questions addressed by Adam Smith: How are relative prices determined? How is economic activity coordinated? What are the causes of economic growth? The special approach of the value paradigm is reasonably successful when applied to the first of these questions. It is not unrealistic to think of the forces that determine prices, at least in the short run, as being relatively powerful and rapid, relying as they do primarily on trading and arbitrage.²⁷ In these circumstances, the assumption of trading equilibrium is a fruitful simplification—fruitful because it permits the greater precision and logical clarity of mathematical reasoning. However, when applied to questions of coordination and growth the assumption of trading equilibrium is not at all realistic. The corresponding processes are “computationally irreducible”: no mathematical shortcut is available. *Trying to impose a mathematical formulation in these circumstances leads not to precision and clarity but to nonsense.*

To reiterate, there is nothing wrong with the theory of value as a theory of value. Indeed in many ways it is the crown jewel of economics. The problem is with the value paradigm—that is, with the attempt to extend assumptions that are appropriate to the theory of value to areas of economics where they are not appropriate. The theory of value is a special or partial theory, not a general theory.

order to avoid phenomena that do not happen to be simple enough to be computationally reducible” (Wolfram 2002: 741–42).

²⁷The useful concepts of “short run” and “long run” were central to the Marshallian theory of value (see Leijonhufvud (1998, 2004). Unfortunately, this distinction has no place in the Walrasian theory.

The Two Paradigms and the Theory of Growth

The failings of the value paradigm as a general theory of economics—and the promise of the exchange paradigm—are most evident in their respective theories of economic growth.

Change and Uncertainty

The different theories of growth of the two paradigms are largely dictated by their different understandings of change and uncertainty. For the value paradigm the nature of change and uncertainty is dictated, like everything else, by the fundamental assumption of trading equilibrium. Trading equilibrium is an equilibrium of mutually consistent individual plans. To accommodate change and uncertainty, the set of prices on which these plans are based must span time and states of nature. That is, there must be prices for forward transactions as well as for spot transactions and prices for contingent as well as for certain delivery. Trading equilibrium encompasses change and uncertainty in that equilibrium individual plans may involve actions that change over time and actions that are contingent on uncertain events.

At a more fundamental level, however, there is no real change or uncertainty. Individual plans are made and reconciled before “time” begins—before anything actually happens. At that single moment of decision, everything that could possibly exist is anticipated: all of the future and all possible states of nature are presented.²⁸ What will happen over time and in the various states of nature is settled once individuals’ plans have been reconciled and determined. “Time” then begins. As it unfolds and states of nature eventuate individuals’ actions may change. However, their actions change according to their predetermined plans; the plans themselves do not change.²⁹ Change in the value paradigm is sometimes described as a “moving equilibrium.” This is inaccurate: it is rather movement *within* an equilibrium. In the world of the value paradigm there is nothing therefore fundamentally new, nothing unanticipated, no innovation.³⁰

²⁸Romer (1994) identifies this property of the value paradigm with the philosophical “principle of plenitude.” This asserts that “the world is full”—that “every conceivable entity already exists.”

²⁹Bode (1943) makes the fruitful distinction between *equilibrium analysis*, which studies the internal and mutual consistency of unchanging plans, and *process analysis*, which studies changing plans. The value paradigm, of course, produces equilibrium analysis. We shall see presently that the exchange paradigm produces process analysis.

³⁰In some interesting recent work, Makowski and Ostroy (2001) offer a richer specification of the value paradigm that does include innovation of a kind. They do this by expanding the definition of equilibrium. Individual plans, reconciled in equilibrium, include innovation as

For the exchange paradigm change and uncertainty, like everything else, emerge out of individual behavior. Individuals act and interact to further their individual and common interests. They do so through three types of activity. They seek out and exploit opportunities for gain through buying and selling and production (“trading”). They generate new opportunities through the creation of new products, new technologies, and new markets (“innovation”). And, to further their interests, they modify existing institutions and create new ones (“institutional change”).

These three types of activity generate a process of continuing and cumulative change. Trading creates new opportunities for innovation and institutional change. Innovation creates new opportunities for institutional change and trading. Institutional change creates new opportunities for trading and innovation. The process of continuing and cumulative change is endogenous: the process generates change in and of itself.³¹ Such endogenous change may, of course, be compounded by exogenous shocks.

The future path of this process of change is not predictable. The situation is not one of disequilibrium; the process does not converge on or “discover” a known or predictable outcome.³² There is therefore no theoretical shortcut that will tell us as observers—or tell participants in the economy—where the process is going. Unpredictability is not therefore a result of external shocks but of complexity arising from the action and interaction of individuals.³³

This is not to say of course that nothing is predictable. For example, as we have seen, the relative rapidity of the trading subprocess justifies the theoretical shortcut that underlies the theory of value. We can often therefore predict the short-run behavior of relative prices. There may be other similar instances in which we can predict certain aspects of the economic process. However, the economic process as

well as purchases and sales. Innovation is therefore *equilibrium* innovation. All potential innovations are known in advance, and individuals make their plans to innovate before the beginning of time. Innovation in this sense involves no surprises and no disruption.

³¹Seeing the economy in these terms is the hallmark of the Austrian school (see, e.g., Menger [1871] 1981), Hayek 1973, and Mises 1949).

³²The modern Austrians are divided on this point. Some, think of the process as converging on equilibrium (Kirzner 1997). Others see it in much the terms described here: “Entrepreneurial activity, in particular, is not to be modeled as discovery of what is ‘out there’. Such activity, by contrast, *creates* a reality that will be different subsequent on differing choices” (Buchanan and Vanberg 1991: 178; italics in original).

³³In the terms of Wolfram’s NKS, relatively simple rules of individual behavior generate a complex aggregate process. This process is unpredictable because it is computationally irreducible. There is no way to know the consequences “except in effect just to watch and see how they unfold” (Wolfram 2002: 846).

a whole is not moving toward any known outcome and it is unpredictable in principle.

In this environment, uncertainty takes on a very different meaning. In the value paradigm uncertainty means uncertainty about which of a known set of possible events will occur. In the exchange paradigm there *is* no known set of possible events. This is true uncertainty of the kind described by Knight, Shackle, and Lachman. Buchanan and Vanberg speak of “history as an open-ended evolving process, and of a future that is not predetermined, merely waiting to be revealed, but that is ‘continuously *originated* by the pattern and sequence of human choice’” (Buchanan and Vanberg 1991: 179).³⁴

The very different conceptions of change and uncertainty of the two paradigms imply very different understandings of the process of economic growth.

Economic Growth

For the value paradigm change means movement along an equilibrium path. It consequently comprehends economic growth in precisely these terms. At any moment, the potential output of the economy is determined by the resources and technology available. Because the economy is in trading equilibrium, this potential is always fully realized. Consequently, output can grow only if there are more resources or if there is better technology. This theory of growth originates with Ricardo.

The Hicks-Samuelson version of the Ricardian theory is a mathematical model due to Solow (1970). The Solow model assumes the existence of an aggregate production function that determines output for given inputs of capital and labor. As physical and human capital accumulate, labor productivity increases and with it per capita income. Eventually, however, decreasing returns to capital bring this process to a halt. Stagnation can be averted only through technological progress—changes in the nature of the production function that increase output for given inputs of capital and labor.

However, technological progress is a problem for the value paradigm because it is difficult to reconcile with trading equilibrium. As we have seen, trading equilibrium cannot accommodate the most obvious explanation of technological progress—innovative behavior on the part of individuals. The Solow model gets around this by making technological progress exogenous: technological progress just happens (outside the model) and the theory of growth has no need to

³⁴The internal quote is from Littlechild (1979: 38); the italics are in the original.

explain it. This is hardly satisfactory: it makes the primary determinant of economic growth noneconomic.³⁵

The new growth theory of Romer (1986) and others has found a way to address this embarrassment and to bring technological progress into the theory in a way consistent with trading equilibrium. The new growth theory models technological progress as an automatic side effect of the process of production itself—a consequence of learning-by-doing. Technological progress is now endogenous but like the exogenous technological progress of the Solow model it just happens. No explicit action on the part of individuals is required. Technological progress is in effect built into the technology: it is there implicitly from the very beginning.³⁶

The exchange paradigm has a very different theory of growth. Growth does not mean movement along an equilibrium path but rather the unfolding of a complex process. At any moment the potential of the economy is not completely realized: unexploited opportunities for mutually advantageous exchange abound. Indeed the “potential” of the economy is not defined; it depends on the initiative and ingenuity of individuals. Individuals engaging in trading, innovation, and institutional change generate the process of growth, not only discovering potential but also creating it.³⁷

Trading results in the expansion of markets. The expansion of markets raises productivity by inducing a reorganization of production.³⁸ This reorganization includes the increasing division of labor and specialization according to comparative advantage (Smith [1776] 1976 and Ricardo 1817, respectively). But it also includes more complex forms of reorganization. For example Jacobs (1969) describes the

³⁵When he applied his model to statistical data, Solow found that capital accumulation accounted for a relatively small part of economic growth: the remainder—that is most of it—he attributed to technological progress.

³⁶This type of technological progress is consistent with innovation in the sense of Makowski and Ostroy (2001). In their formulation, innovation is preplanned given the technological possibilities available to individuals before the beginning of time. Romer’s technological progress can be thought of as being the result of such preplanned innovation.

³⁷Grantham (1999) calls such a theory of growth “Smithian” to distinguish it from the Ricardian theory of the value paradigm. He provides an excellent discussion of the relative merits of these two theories in interpreting growth in preindustrial Europe.

³⁸Bauer has emphasized the importance of trading for economic development: “Simultaneously, traders both large and small create new opportunities . . . [The] traders encourage new wants, convey new opportunities, and help farmers to take advantage of them. . . . It is therefore misleading to look upon the network of traders in an LDC as serving only as a pipeline for conveying from producer to consumer a given volume and composition of output. Although none of the traders is trying to transform the economy, their perception and pursuit of opportunities for profit encourages the process” (Bauer 1991: 3; see also Hirschman 1987).

continuous recombination of productive activities taking place in cities. Szostak (1991) and Chandler (1978) describe the reorganizations of manufacturing in the first and second Industrial Revolutions consequent on changes in transportation.

It is the reorganization of production that opens the way for technological progress. Smith explains how the division of labor creates production processes simple enough to be mechanized. Jacobs describes how the recombination of activities in cities produces new techniques and new products. Szostak and Chandler describe how technological progress in the first and second Industrial Revolutions was a consequence, not a cause, of the reorganization of production. Technological progress is therefore endogenous: it is an innovative response by individuals to new opportunities opened up by an expanding market.

Investment, too, is endogenous. It is a *symptom* of growth not a prime cause. Of course, growth generally does involve the accumulation of capital. Mechanization, for example, obviously implies investment in machinery. However, investment in machinery is not the cause of mechanization.

The fallacy of seeing investment as the cause of growth is illustrated by a recent debate on the nature of the “Asian Miracle.” Young (1995) and others have argued that there is no miracle: high rates of growth in Asia are easily explained by high rates of investment—very much according to the growth theory of the value paradigm. Nelson and Pack (1999) respond that this is a very limited sense of the word “explain.” Admittedly, there is an association between the rise in output in Asia and the high rates of investment. However, similarly high rates of investment elsewhere—especially in the communist world—failed to produce anything like the same results.

Why is investment associated with growth in some cases but not in others? The value paradigm provides no answer, because it sees the connection between investment and growth as being automatic. For the exchange paradigm, however, the answer is obvious. The economies of Asia and those of the communist world were undergoing very different processes. In Asia investment was organic—a consequence of the expansion of the market.³⁹ In contrast, in the communist world, investment was imposed from above by socialist planners—a completely different process and not one particularly conducive to raising productivity.

³⁹Nelson and Pack (1999) describe the process of growth in Asia, emphasizing entrepreneurship, innovation, and the assimilation of new technologies. Investments in physical and human capital were a consequence of this process not a cause.

This answer naturally raises another question: Why is the economic process so different in different societies? Once again the value paradigm has no answer. But the exchange paradigm does—different institutions. Some institutions facilitate the sort of individual behavior that produces growth, others do not.⁴⁰ As we have seen, there is no place for institutions in the value paradigm.⁴¹ In the exchange paradigm, the emphasis on institutions as an explanation of differences in the “wealth of nations” goes back to Adam Smith.⁴²

Of course, institutions too are endogenous. Nelson and Sampat (2001) sees institutions as constituting the “social technology” of a society that evolves in parallel with its technology of production. Institutions change relatively slowly, but they do change. When the institutional structure obstructs individual interests rather than furthering them, individuals will act to modify it. Obviously, some institutional structures are more amenable to modification than others.

Normative Implications of the Two Paradigms

The theories that emerge from the two paradigms have very different normative implications. They employ different normative criteria. Their understanding of such normative concepts as “the invisible hand” and “market failure” are different. And they lead to a very different attitude toward government intervention in the economy.

Normative Criteria

A normative criterion is a standard by which to judge whether or not the state of a given economy is a desirable one. For the value paradigm, there is a single normative criterion—(Pareto) efficiency. An economy in trading equilibrium is efficient when individuals are realizing all potential gains from exchange. The potential to be realized is determined by *given* preferences, technology, and endowments. In addition to efficiency, distribution may be a concern, but it is generally considered to be secondary. This neglect can be justified

⁴⁰Kirzner (1985) emphasizes that different institutional orders differ in their success in stimulating entrepreneurship.

⁴¹However, see Makowski and Ostroy (1993) for a discussion, within the value paradigm, of how neglect of incentives led to overly optimistic assessments of the potential for “market socialism.”

⁴²Work that emphasizes the importance of institutions in explaining growth—or its absence—includes that of North and Thomas (1970), Olson (1996), and Nelson (1997).

by the Second Welfare Theorem, which states that efficiency and distribution are essentially separable.⁴³

For the exchange paradigm, the concept of efficiency is meaningless. To begin with, the economy is not in trading equilibrium: indeed unrealized potential gains from exchange are commonplace.⁴⁴ Their pursuit and creation are precisely what drives the process of economic growth. An absence of unrealized potential gains would be evidence not of efficiency but of stagnation. Second, the potential of the economy is not a given. As individuals continually create new opportunities for exchange they continually expand the potential of the economy.⁴⁵ Since there is no set destination toward which the economy is headed, it is meaningless to ask whether or not it has arrived.⁴⁶

The exchange paradigm, deprived of the perfection of efficiency, can set no absolute standard. Its normative criteria must therefore be comparative. It can do no more than compare one situation with another and ask which of the two is preferable. That is, its normative criteria must be ordinal rather than cardinal.

While the exchange paradigm possesses no generally agreed-upon normative criteria, there are some fairly obvious candidates. The exchange paradigm sees the economy as being in a process of continuing change. It therefore seems natural to consider normative criteria that are dynamic—the rate of growth, the adaptability of the economy, the stability of the economy. Other things equal, faster growth would seem preferable. If the rate of growth is uneven, then its variability matters as well as its speed. One source of variability is change in the external environment: other things equal it would seem preferable that the economy adjust to such change more

⁴³Distributional goals can be achieved through lump sum taxes and transfers without affecting the efficiency of the equilibrium.

⁴⁴“For if the economic world is in continuing flux, as our positive theory suggests is the case, the normative properties associated with competitive equilibrium become meaningless, just as that equilibrium is meaningless as a description of behavior” (Nelson and Winter 1982).

⁴⁵“The market economy, as an aggregation, neither maximizes nor minimizes anything. . . . There is simply no ‘external’, independently defined objective against which the results of market processes can be evaluated” (Buchanan and Vanberg 1991: 181).

⁴⁶“We have seen that one can think of the theory of value as being a *partial* theory used to explain the short-run determination of relative prices. Trading equilibrium is a defensible simplifying assumption in this context, and it is defensible too to see the potential gains from trading as being given in the short run. In this very limited sense, one could talk about the efficiency of the resulting allocation. However, this would say nothing whatsoever about the *overall* desirability of the state of the economy as a whole. This is much like the distinction drawn by Schumpeter (1942) between “static efficiency” and “dynamic efficiency.”

quickly—that it be more adaptable.⁴⁷ A second source of variability is the process of growth itself: the process may involve periodic crises or setbacks. Other things equal, it would seem preferable that the economy be more stable (i.e., less subject to endogenous variability).⁴⁸

Consequently, good institutions or policies are those that, other things equal, accelerate growth, contribute to the economy's adaptability and improve its stability. Bad institutions and policies are those that impede growth, reduce adaptability and increase instability. However, the multiplicity of criteria suggests tradeoffs. A particular institution or policy might promote more rapid growth, but it might also reduce adaptability or stability. When judging the effects of institutions or policies or when comparing economies, we may therefore have to trade off one criterion against another. As one example, Jacobs (1969), explains why cities that specialize in a particular activity achieve more rapid growth in the short run, but only at the expense of their adaptability.⁴⁹

The Invisible Hand

An insight that is fundamental to economics is the concept of the “invisible hand.” This is the idea that greedy, purposive individuals engaged in voluntary exchange can achieve, with no central direction, an aggregate outcome that is in some sense “good for all.” Their actions are directed to this end “as if by an invisible hand.”

For the value paradigm “good for all” means efficiency. Its version of the invisible hand is embodied in the First Welfare Theorem, which states that under certain conditions perfect competition will ensure efficiency.⁵⁰ For the value paradigm perfect competition means that individuals are price takers. That is, each individual is

⁴⁷Compare, for example, Hayek and Braudel: “The economic problem of society is mainly one of rapid adaptation to changes in the particular circumstances of time and place” (Hayek 1945); “Let me emphasize the quality that seems to me to be an essential feature of the general history of capitalism: its unlimited flexibility, its capacity for change and *adaptation*” (Braudel 1982: 432; italics in original).

⁴⁸If the external environment is volatile, an economy can be stable, by this definition, even if it is subject to considerable variation. Moreover, an adaptable economy may be more variable than one that is slow to adapt.

⁴⁹De Vries applies a similar argument to countries: “The Dutch Republic stands as an example of an economy whose intense specialization in one direction effectively closed the door to the kinds of social structure and economic policies required for industrial growth. Not every growth path led to the Industrial Revolution” (de Vries 1976: 252).

⁵⁰The key conditions are that all mutually beneficial trades are actually possible (“complete markets”) and that there are no increasing returns in the technology of production (this would give an advantage to large producers and so undermine competition).

insignificant: his presence or absence has no impact on equilibrium prices. In this situation, the possibilities of individual action are extremely limited: all the individual can do is to buy or to sell at the given prices.

This expression of the concept of the invisible hand deprives it of much of its power. What makes the concept interesting is the apparent paradox inherent in the idea of individual selfishness resulting unintentionally in social good. However, in the value paradigm version of the invisible hand, there really is no paradox. By assumption, the selfish individual has no capacity to do any harm. Moreover, the social good that he does is exactly equal to his own gain from participating in the economy.⁵¹

The meaning of the invisible hand for the exchange paradigm is both more subtle and more powerful. As we have seen, the exchange paradigm has a much richer conception of individual behavior. It does not rule out socially harmful behavior by assumption but takes it into account explicitly. Smith very much shared this view. He saw people as naturally deceitful and unscrupulous. He recognized that they did not limit their pursuit of advantage to the marketplace alone. On the one hand, individuals can benefit from producing market value for others. On the other, they can benefit from predation, opportunism, rent seeking, and holdup. Smith understood the role of the invisible hand as blocking the avenues of socially unproductive and harmful behavior, leaving the production of market value for others as the easiest way for individuals to further their own interests.

In the exchange paradigm socially harmful individual behavior is not foreclosed by assumption but rather by institutions.⁵² The freedom to pursue self-interest does not produce social good automatically: it does so only when the institutional framework of exchange restricts potentially harmful behavior. It is institutions therefore that constitute the invisible hand.⁵³

Smith argued that the institutional order most conducive to channeling self-interest in a positive direction is competition. But competition does not mean price-taking and insignificance. It means rivalry

⁵¹In the terminology of Makowski and Ostroy (2001) the perfect competitor is a full appropriator. That is why he is insignificant: his presence in the economy or his absence matter only to himself.

⁵²It is the function of institutional arrangements to cut off all avenues (and there are many) along which wealth may be pursued without contributing to the welfare of society" (Rosenberg 1960: 560).

⁵³Adam Smith's "invisible hand" is invisible only to someone who is blind to the function of institutions" (Papandreou 1994: 221).

in the marketplace with other greedy purposive individuals. It is not an absence of power but countervailing power.⁵⁴ Competition promotes the cutting of prices and the lowering of costs. By reducing profits from existing ventures, it promotes the seeking out of new opportunities, quickening the pace of economic expansion.⁵⁵

Competition is enhanced by institutions that reduce the difficulties of exchange or lower barriers to rivalry. Competition is impaired by institutions that make exchange more difficult or that establish special privilege. For Smith, the antithesis of competition was mercantilism. He saw its principal harm, however, not in the triangles of surplus lost to price distortions but in the diversion of individual effort into the socially unproductive acquisition of governmental favors. Such favors allowed individuals to enrich themselves at the expense of others rather than doing so by adding to the wealth of the nation.⁵⁶

The invisible hand of the exchange paradigm also differs from that of the value paradigm in terms of what it can accomplish. The value paradigm sees the invisible hand as achieving—under conditions of perfect competition—a state of social harmony. It focuses on the conditions for this to happen. The exchange paradigm sees the invisible hand as *promoting* social harmony rather than achieving it. It focuses on the relative merits of alternative institutional arrangements in promoting social harmony.

Market Failure

For the value paradigm, failure of any of the conditions of the First Welfare Theorem may result in unexploited potential gains from exchange. Such an outcome is inefficient and represents a failure of the invisible hand to bring about social harmony. This situation is described as being one of “market failure.” Efficiency is the point of reference for the value paradigm—the ideal. Anything less is failure.

⁵⁴“A market is not competitive by assumption or by construction. A market *becomes* competitive, and competitive rules *come to be* established as institutions emerge to place limits on individual behavior patterns. It is the *becoming* process, brought about by the continuous pressure of human behavior in exchange, that is the central part of our discipline, if we have one, not the dry-rot of postulated perfection” (Buchanan: 1964).

⁵⁵Smith also recognized that people have a “love of ease and inactivity” and that “the institutional order needs to apply the proper amount of psychic tension to elicit the right intensity of effort” (Rosenberg 1960).

⁵⁶Smith’s concern with institutions went beyond his advocacy of competition. He recognized the importance of organizational structures other than the market. For example, he opposed joint stock companies on the grounds that separating ownership from management would reduce the quality of the latter. He also discussed how best, in terms of incentives, to organize government activity.

Market failure, however, is a misnomer. As we have seen, the market *as an institution* is completely absent from the theoretical framework of the value paradigm. If there is failure here, it is not of the market. Rather, it is a failure of certain assumptions to hold. Either there is a failure of the assumptions that ensure that individuals have no capacity for socially harmful behavior (the assumptions underlying price-taking). Or there is a failure of the assumptions that ensure that individuals acting *atomistically* can in principle achieve social harmony (remember that the value paradigm rules out cooperative behavior or institutions that further common interests).

Of course, the real world does not correspond at all well to the assumptions of the First Welfare Theorem. It is rife with market power, costs of exchange, externalities, and increasing returns. Consequently, if we adhere to this conceptual framework, most real-world phenomena—from recessions to vertical integration of an industry—must be understood as instances of market failure.

For the exchange paradigm, the concept of market failure is meaningless. Since there is no ideal against which to measure the state of the economy it is nonsensical to talk of success or failure in achieving it. As we have seen, the existence of unexploited potential gains from exchange is not a pathology but a normal—indeed essential—feature of the economic process. Individuals are constantly seeking out existing unexploited gains and creating new ones. An economy that is growing rapidly will be one that exhibits many such “inefficiencies.”⁵⁷ This does not of course preclude consideration of issues such as market power and externalities. However there is no automatic presumption that the market has “failed” or that intervention is desirable.

Intervention

For the value paradigm, market failure begs correction. By definition, it cannot be corrected through the action of individuals: in trading equilibrium individuals are already doing all they can. By assumption, it cannot be corrected by individuals acting together through private institutions. As we have seen, there is no place for such institutions in the value paradigm. Indeed the value paradigm views any form of joint action with suspicion: it considers it inconsistent with the atomistic behavior that perfect competition requires.

Since there is nothing *in* the economy that could possibly correct market failure, the value paradigm invokes an agent from *outside* the

⁵⁷Jacobs (1969) emphasizes that cities are engines of growth not despite their inefficiencies but because of them.

economy—a *deus ex machina*. That agent is labeled “government,” and it is tasked with selflessly correcting market failures. Needless to say, this invocation of a disembodied benign agent violates the principle of methodological individualism. Moreover, if we remedy this by thinking of government as an institution for joint action, the implicitly optimistic view of government behavior is at striking variance with the value paradigm’s jaundiced view of joint action in general. Other institutions can only do harm; government can only do good.

For the value paradigm, correcting market failure is easy. First of all, it is easy to know what the government needs to do and what will be the consequences of its action. The economy is in trading equilibrium. Except for a single clearly defined market failure, this is a situation of perfection—an ideal state. All the government needs to do is remove the blemish and perfection will be attained. Correcting the market failure is easy, because the government is endowed with extraordinary powers. For example, in the case of externalities, some potential gains from exchange go unrealized because they involve nonmarket interdependence among individuals. The value paradigm takes it for granted that government can coerce or induce the individual actions required to realize these gains. However, such gains presumably go unrealized because there is something inherent in the situation that makes private coordination of the necessary action too difficult. Otherwise, as Coase (1960) pointed out, such coordination would readily be forthcoming and no such externality would exist. Whatever the inherent difficulty, the value paradigm simply assumes that the government is able to overcome it.

The exchange paradigm implies a very different view of government intervention. This difference stems from its very different understanding of the motives and capacity of government and its very different vision of the economic process.

For the exchange paradigm, government is not external to the economy, it is part of it—one of many institutions. What distinguishes government from other institutions is its particular technology—the command of coercive force. It can employ force in a variety of ways. It can employ it for predation (redistribution). It can employ it to provide protection against rival predators (defense and criminal law). It can employ it to enforce agreements (civil law). And it can employ it to influence individual behavior (regulation).

Like other institutions, government may either promote economic activity or hinder it. It can promote economic activity, for example, by establishing and enforcing appropriate “rules of the game” for economic interaction. Or it can act as a vehicle of joint action to provide public goods. On the other hand, the government can destroy

individual incentives through predation and so hamstring economic progress.⁵⁸ The government can also employ force to *prevent* mutually advantageous exchange by means of trade barriers and anti-competitive regulation. Viewing government primarily as a problem rather than as a solution has a long history in economics that goes back to Smith, Condillac, and Bastiat.

Like other institutions, government has no motives of its own: it is a forum of interaction among individuals. Individuals attempt to enlist the coercive power of the government in their own interest. That is, individuals engage in rent seeking (Tullock 1989). They do this through the political process and through other means such as corruption. There can consequently be no separation between economics and politics: politics is the pursuit of economic self-interest through other means. This is the basic premise of the literature on public choice.⁵⁹

For the exchange paradigm, government intervention is not the only conceivable solution to a problem. As we have seen, the exchange paradigm has greater faith in the ability of the invisible hand to order economic activity. This is partly because it contemplates a broader range of possible individual responses—innovation and institutional change as well as trading. For instance, if joint action is needed to address a problem, individuals are quite capable of creating or modifying private institutions to this end. As an example, there are a variety of potential externalities in the financial system. Bank runs are the result of a “composition externality”: when each individual does what is best for himself, the outcome is worse for all. Financial scandals involve a reputational externality: they damage not only the reputation of the firms concerned but also the reputation (and so the stock prices) of other firms. Today, the government addresses these potential externalities through deposit insurance and security regulation, respectively. But before the government intervened solutions were provided by private institutions. Bank clearinghouses coordinated the response to bank runs, and security exchanges regulated listed companies. Government intervention has superceded and displaced these “private orderings.” It is not obvious in these cases or in others that this constitutes an improvement. In general, government intervention to address a problem undermines private incentive to do so, which perpetuates the problem and so the “need” for government intervention.

⁵⁸On the predatory state and its economic consequences, see Olson (2000).

⁵⁹The seminal work was that of Buchanan and Tullock (1965).

The exchange paradigm's view of government intervention is shaped not only by its different understanding of government but also by its very different understanding of the economic process. For the exchange paradigm there is no ideal state of the economy, and intervention cannot therefore be understood as an attempt to attain such an ideal state. The question is not whether intervention will get us to perfection but whether it will leave us better off or worse off than before.⁶⁰

Answering this question is not at all easy because it is hard to know in advance what will be the consequences of a particular intervention. Intervention means interference in a complex unfolding process that is inherently unpredictable. Inevitably, intervention will have unintended consequences. No amount of analysis will rule out unpleasant surprises, because to some degree the consequences are unpredictable in principle.

The nature of the economic process stacks the odds against intervention being beneficial. As we have seen, the economic process is driven by the action and interaction of individuals. It is much easier to hinder this process than it is to help it:

The true costs of badly designed government interventions, and especially of trade restrictions . . . come not from their effects on the static allocation of resources between the activities in an economy that already exist. Rather, they come from the stifling effect that the distortions have on the adoption of new technologies, the provision of new types of services, the exploitation of new productive activities, and on imports of new types of capital goods and produced inputs [Romer 1994].

Why, for example, did the communist economies fail? For the value paradigm, the only possible answer is that central planners, for whatever reason, failed to set the right prices and that this caused the allocation of resources to be inefficient. For the exchange paradigm the explanation is very different. A central planner "cannot create what is not there and will not be there save through the exercise of the creative choices of individuals, who themselves have no idea in advance concerning the ideas that their own imaginations will yield" (Buchanan and Vanberg 1991: 184). The problem with government

⁶⁰The view that pervades much public policy economics implicitly presents the relevant choice as between an ideal norm and an existing 'imperfect' institutional arrangement. This *nirvana* approach differs considerably from a *comparative institutional* approach in which the relevant choice is between alternative real institutional arrangements" (Demsetz 1969).

control of the economy is that it kills the process of economic growth by blocking individual initiative.⁶¹

Of course, the economic process can itself help to mitigate some of the damage done by government intervention. Just as individuals find ways to overcome other obstacles to exchange, so will they find ways to overcome the obstacles erected by governments:

[In] the political body, the natural effort which every man is continually making to better his own condition, is a principle of preservation capable of preventing and correcting, in many respects, the bad effects of political economy, in some degree both partial and oppressive. Such a political economy, though it no doubt retards more or less, is not always capable of stopping altogether the natural progress of a nation towards wealth and prosperity [Smith (1776) 1976: 194].

In general, the view of government intervention that emerges from the exchange paradigm suggests an analogy with medicine. Doctors do not think in terms of a model of a perfectly healthy patient. They recognize that there are many illnesses they cannot treat and many others not worth treating. In judging a proposed treatment, they do not ask whether it will return a patient to “perfect health”; they ask whether it will improve the patient’s condition. The doctor’s guiding principle is, “First, do no harm.” Because doctors recognize that their understanding of the functioning of the human body does not enable them to predict all of the effects of a particular treatment, they judge it not on its theoretical merits but on its success in experimental trials. The “body economic” is no less complex. While theory may be useful in suggesting possible remedies, the most reliable evidence of their efficacy is empirical. Economic history is the nearest equivalent we have to drug testing.⁶²

Given the very different normative implications of the two paradigms, it is not surprising to find them associated with different political philosophies. The value paradigm sees reality in terms of an ideal. The real world fails to attain this ideal because the market is not up to the task. The value paradigm sees no obstacle to correcting the failure of the market and to achieving the ideal state through government intervention. It is hardly surprising that these views should be

⁶¹On government as the main historic obstacle to economic development, see Jones (2000).

⁶²Recent work using macroeconomic and financial history to assess the efficacy of different types of policy includes, for example, Romer and Romer (1994) and Calomiris and Hanes (1994).

attractive to socialists and to other idealists.⁶³ The exchange paradigm sees the world as an imperfect place and places considerable faith in the ameliorative power of market processes. It is suspicious of government motives and skeptical about the benefits of government intervention. It is not surprising that these views should be congenial to conservatives and to libertarians.

Hybrid Theory and Its Problems

Much recent work in economic theory has found itself caught between two worlds: between the value paradigm and the exchange paradigm. Such work embraces many of the ideas of the exchange paradigm—costly exchange, asymmetric information, and increasing returns—but it does so within the context of the value paradigm. Examples include the new increasing returns theories of trade and growth; general equilibrium models of money (see Kohn 1988); and equilibrium models of economic organization.⁶⁴ This sort of *hybrid theory* typically suffers from several problems. Retaining the assumption of trading equilibrium unnecessarily constrains its positive analysis. Introducing selected elements of the exchange paradigm into the world of the value paradigm produces normative conclusions that are misleading. Introducing elements of the exchange paradigm into the value paradigm where they do not belong results in considerable confusion. Before we look at some examples, let us ask why hybrid theory is nonetheless so popular.

Why Hybrid Theory?

Researchers have a heavy investment in existing ways of thought, and they feel more comfortable with what they already know and understand. The surest way to be ignored is to run around proclaiming a “new paradigm” and calling for the junking of painfully acquired human capital. Conversely, it is much easier to sell something new if it is presented as a modification and an improvement rather than as a radical departure (even when it is). Not surprisingly then, to gain acceptance researchers generally try to accommodate new ideas within the existing framework. Such natural conservatism is

⁶³Coase (1994) notes the inherent bias of what he calls “high theory” toward government intervention and socialism.

⁶⁴Eggertsson (1990) distinguishes between Neoinstitutional Economics and the New Institutional Economics. The former introduces transactions costs, asymmetric information, and property rights, but accepts the “hard core” of the value paradigm (stable preferences, maximization, equilibrium). The latter rejects the value paradigm entirely.

reinforced in this particular case by a reluctance to forgo two features of the value paradigm that many find attractive—the ease of mathematical modeling and its strong normative conclusions.

There is a general belief among economic theorists that a theory not expressed in the form of a mathematical model is not to be taken seriously.⁶⁵ We have seen that, while there is no necessary connection between mathematical theory and the value paradigm, the latter does provide a very congenial environment for the former. This is because the value paradigm assumes trading equilibrium. The exchange paradigm on the other hand lacks any concept of equilibrium, and this makes mathematical modeling problematic. Consequently, theorists wishing to express their ideas in mathematical form—or feeling that they need to—have a good reason to stay within the value paradigm.

The normative apparatus of the value paradigm produces sharp results: a particular situation is either good (efficient) or bad (inefficient). Consequently, hybrid theories can be useful both to those wishing to make a case for government intervention and to those opposing it. Interventionists can introduce into the value paradigm additional obstacles to exchange and produce a bonanza of new market failures. Those opposed to intervention can argue that a particular alleged case of market failure is not really market failure at all once we take into account the obstacles to exchange: the strongest possible argument against intervention is the argument that whatever exists must be optimal. As we have seen, the exchange paradigm has much less to offer in terms of normative conclusions: there is no such thing as market failure but neither do we live in the best of all possible worlds.

Why Not Hybrid Theory?

The first problem with hybrid theory—as our earlier discussion of the new growth theory illustrates—is that staying within the bounds of the value paradigm severely constrains the positive analysis.⁶⁶ New growth theory does succeed in bringing technological progress within the theoretical framework but it does so in a way that is artificial and limited: it is technological progress without innovation. For this

⁶⁵“Economic theory is essentially a collection of models. Broad insights that are not expressed in model form may temporarily attract attention and even win converts, but they do not endure unless codified in a reproducible and teachable form” (Krugman 1992).

⁶⁶“Part of the agenda of the new growth theory, or a constraint on that agenda, is to hold modeling as close as possible to the canons of general equilibrium theory. . . . But it is certainly relevant to think a bit about what is gained and what is lost by operating under this constraint” (Nelson 1997: 33).

reason, the new growth theory is no more successful than the old in capturing the underlying causes of growth.

Much the same could be said of the “new theory of trade.” The traditional theory attributes the benefits of free trade to the improved allocation of resources that it makes possible. The basis for this improvement is comparative advantage, and the basis for comparative advantage is differences—differences among countries, among regions, and among individuals. In traditional theory these differences are innate. What is new about the new theory of trade is that some differences are seen as being endogenous—mainly the result of increasing returns. The new theory of trade like the new theory of growth takes a key variable and brings it within the theoretical framework. However, a continued adherence to the value paradigm and to trading equilibrium does not allow the new theory of trade, any more than the old, to address the ultimately more important *dynamic* benefits of trade—increased competition (in the sense of rivalry), reduced opportunities for rent seeking, more rapid innovation, and the availability of new products and processes. Such dynamic considerations are, of course, at the heart of the exchange paradigm.

The second problem with hybrid theory is that its welfare conclusions, while strong, are also misleading. Theorists who favor government intervention introduce into their models some of the problems of exchange associated with the exchange paradigm such as asymmetric information. However, they fail to introduce into their models the *solutions* to these same problems that the exchange paradigm suggests—for example, joint action through private institutions. Ergo massive market failure. And with private remedies ruled out by assumption, only government intervention can help.⁶⁷

Hybrid theorists opposed to intervention, on the other hand, introduce into the value paradigm both the problems associated with the exchange paradigm and the solutions. For example, the new equilibrium theory of economic organization introduces both costly exchange and economic institutions—the role of economic institutions being to minimize the costs of exchange.⁶⁸ Because this all takes place under the assumption of trading equilibrium (no unrealized gains), the solution is efficient and cannot be improved upon. The result is

⁶⁷For a (very gentle) critique of the work of Greenwald and Stiglitz on the welfare implications of asymmetric information, see Dixit (2003).

⁶⁸“We try to understand existing arrangements as efficient choices, and we interpret changes in these arrangements as efficiency-enhancing responses to changes in the environment within which the arrangements exist” (Milgrom and Roberts 1992). For surveys of this literature, see Milgrom and Roberts (1992) and Eggertsson (1990).

standard welfare economics, but now with market failure excluded by assumption. Anything that looks like market failure turns out not to be once we take into account the costs of exchange.⁶⁹ Given these costs, and without assuming that the government can magically overcome them, the market solution is as good as it gets: it is “constrained efficient” or “incentive efficient.”

What converts market failure into an efficient outcome is the assumption of trading equilibrium. However, as we have seen, a world with costly exchange and economic institutions is not a world in which trading equilibrium is a plausible assumption: it is the world of the exchange paradigm not the world of the value paradigm. Without the assumption of trading equilibrium, there is no implication that existing institutions are efficient. Indeed, as we have seen, efficiency is not a meaningful concept. Moreover, the assumption that institutions minimize costs violates the principle of methodological individualism and begs the question of how such institutions come into being.⁷⁰ This matters, because to understand the problems of developing and transition economies, we need to understand how and why desirable institutions emerge or fail to emerge.⁷¹

The third problem with hybrid theory is that it spawns confusion. As the preceding discussion illustrates, introducing into the value paradigm bits and pieces taken selectively from the exchange paradigm produces a theory that is internally inconsistent. Confusion is the inevitable result. Another cause of confusion is a failure to understand the distinction between hybrid theory and the exchange paradigm proper. A good example of this is a recent debate between Posner on one side and Coase and Williamson on the other.⁷² With Posner having in mind a hybrid theory of institutions and Coase and Williamson thinking in terms of the exchange paradigm the debate is largely at cross purposes. Posner cannot understand how Coase and Williamson are able to accept that individuals prefer more to less but

⁶⁹“If an existing institution or arrangement appears to be inefficient, one can always claim that it is simply because the observer has not recognized all the relevant transaction costs” (Milgrom and Roberts 1990). This sort of reasoning was typical of the early public choice literature (see North 1984) and is still typical of much of the literature on financial institutions and on law and economics.

⁷⁰It is a form of functionalism: “All institutions or behavioral patterns have a function that explains their presence” (see Rutherford 1994 and Papandreu 1994).

⁷¹Field (1981) and Basu, Jones, and Schlicht (1987) object to formal theories that make economic institutions endogenous. They argue that such theories are ahistorical and cannot explain the origin of institutions. But it is not formalism or the endogeneity of institutions that makes a theory ahistorical, it is the assumption of trading equilibrium.

⁷²Posner (1993), Coase (1993), and Williamson (1993).

at the same time reject “rational” maximization; he finds Williamson’s concept of bounded rationality particularly mystifying. But, as we have seen, maximization is not “rational” behavior; it is equilibrium behavior. Posner assumes trading equilibrium; Coase and Williamson reject it. The maximizing behavior assumed by Posner makes no sense in the economic environment assumed by Coase and Williamson. Behavior that is rational in that environment is precisely what Williamson means by bounded rationality. Posner, for whom economic theory and the value paradigm are the same, cannot understand why Coase and Williamson seem to object to economic theory. Of course they do not: they object to the value paradigm. There is a similar misunderstanding with respect to the use of mathematics. Posner cannot understand how Coase can object to a particular type of mathematical theory (general equilibrium theory) while having no objection to mathematical theory in general.

A New Research Program

What then are the implications of the exchange paradigm for the future direction of economic research? What sort of a research program does it suggest?

First, the exchange paradigm suggests a renewed interest in economic history. To even hope to understand how the economic process works we need first of all to observe it: good science is primarily observation.⁷³ Today’s advanced economies do not seem likely to provide us with sufficient variation to identify the forces at work. So it seems natural to turn to the great laboratory of economic history. There we can observe those forces working over long periods of time and in a variety of environments. The developing and transition economies provide another promising source of variation. Economic history and economic development are mistakenly seen as being of interest only to the specialists. Certainly, it is the specialists who establish the facts. But those facts are of immense importance to any economist interested in understanding the nature of the economic process.⁷⁴

Second, the exchange paradigm implies that the facts that should interest us are not just quantitative facts. We need qualitative evidence on how individuals behave and interact, on how economic institutions of various kinds work, and on how institutions facilitate or

⁷³“The world Coase sees is always the real world, and until he came along many of us did not know it could be so interesting” (Cheung 1992).

⁷⁴For an example of work in this spirit, see (Kohn forthcoming).

impede economic progress. There is a growing body of such work produced by economic historians and by adherents of the new institutional economics. In the importance it attaches to non-quantitative data, a research program inspired by the exchange paradigm differs from and complements the research program of applied econometrics.

Third, the exchange paradigm implies a different kind of theoretical work. Nelson (1997) has made the fruitful distinction between appreciative theorizing and formal theorizing: “The hallmark of appreciative theory is storytelling that is close to the empirical details, the hallmark of formal theorizing is an abstract structure set up to enable one to explore, find, and check proposed logical connections” (Nelson 1997: 34). It is appreciative theorizing that is most useful in empirical work: it helps us interpret empirical results and it suggests the direction for new empirical research.⁷⁵ The role of formal theorizing, which relies much more heavily on mathematics, is to refine and to unify appreciative theory. Given the state of our knowledge—both empirical and theoretical—it is appreciative theorizing that we need. At this point, formal theorizing seems premature.⁷⁶

References

- Alchian, A. A. (1950) “Uncertainty, Evolution, and Economic Theory.” *Journal of Political Economy* 58: 211–21.
- Arrow, K. J. (1994) “Methodological Individualism and Social Knowledge.” *American Economic Review* 84: 1–9.
- Basu, K.; Jones, E.; et al. (1987) “The Growth and Decay of Custom: The Role of the New Institutional Economics in Economic History.” *Explorations in Economic History* 24: 1–21.
- Bauer, P. (1991) *The Development Frontier: Essays in Applied Economics*. Cambridge, Mass.: Harvard University Press.
- Biema, M. von, and Greenwald, B. (1997) “Managing Our Way to Higher Service Sector Productivity.” *Harvard Business Review* 75: 87–96.
- Bode, K. (1943) “Plan Analysis and Process Analysis.” *American Economic Review* 33: 348–54.
- Boettke, P. J. (1998) “Formalism and Contemporary Economics: A Reply to Hausman, Heilbroner, and Mayer.” *Critical Review* 12: 173–86.
- Braudel, F. (1982) *The Wheels of Commerce*. New York: Harper and Row.

⁷⁵“All that I am really advocating is ‘good’ political economy that results in ‘better’ narrative history. The purpose of theory is to aid the task of writing history (including the diagnosis of contemporary problems)” (Boettke 1998: 183).

⁷⁶“Indeed, once we begin to uncover the real factors affecting the performance of the economic system, the complicated interrelations between them will clearly necessitate a mathematical treatment, as in the natural sciences, and economists like myself, who write in prose, will take their bow. May this period soon come” (Coase 1992).

- Browning, M., and Lusardi, A. (1996) "Household Saving: Micro Theories and Micro Facts." *Journal of Economic Literature* 34: 1797–1855.
- Buchanan, J. M. (1964) "What Should Economists Do?" *Southern Economic Journal* 30: 213–22.
- Buchanan, J. M., and Tullock, G. (1965) *The Calculus of Consent: Logical Foundations of Constitutional Democracy*. Ann Arbor: University of Michigan Press.
- Buchanan, J. M., and Vanberg, V. J. (1991) "The Market as a Creative Process." *Economics and Philosophy* 7: 167–86.
- Calomiris, C. W., and Hanes, C. (1994) "Historical Macroeconomics and American Macroeconomic History." NBER Working Paper 4935.
- Chandler, A. D., Jr. (1978) "The United States: Evolution of Enterprise." In P. Mathias and M. M. Postan (eds.) *Cambridge Economic History of Europe, vol. 7: The Industrial Economies Capital, Labour, and Enterprise; Part 2, The United States, Japan, and Russia*. Cambridge: Cambridge University Press.
- Cheung, S. N. S. (1992) "On the New Institutional Economics." In L. Werin and H. Wijkander (eds.) *Contract Economics..* Oxford: Blackwell.
- Chiappori, P.-A., and Levitt, S. D. (2003) "An Examination of the Influence of Theory and Individual Theorists on Empirical Research in Microeconomics." *American Economic Review* 93: 151–55.
- Coase, R. (1960) "The Problem of Social Cost." *Journal of Law and Economics* 3: 1–44.
- _____ (1992) "The Institutional Structure of Production." *American Economic Review* 82: 713–19.
- _____ (1993) "Coase on Posner on Coase." *Journal of Institutional and Theoretical Economics* 149: 96–98.
- _____ (1994) *Essays on Economics and Economists*. Chicago: University of Chicago Press.
- de Vries, J. (1976) *Economy of Europe in an Age of Crisis 1600–1750*. Cambridge: Cambridge University Press.
- Demirgüç-Kunt, A., and Levine, R. (eds.) (2001) *Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development*. Cambridge, Mass: MIT Press.
- Demsetz, H. (1969) "Information and Efficiency: Another Viewpoint." *Journal of Law and Economics* 12: 1–22
- Dixit, A. (2003) "Whither Greenwald–Stiglitz?" Paper presented at Joseph Stiglitz's 60th birthday conference, Columbia University, October 24.
- Easterly, W. (2001) *The Elusive Quest for Growth: Economists' Adventures and Misadventures in the Tropics*. Cambridge: Mass., MIT Press.
- Eggertsson, T. (1990) *Economic Behavior and Institutions*. Cambridge: Cambridge University Press.
- Field, A. J. (1981) "The Problem with Neoclassical Institutional Economics: A Critique with Special Reference to the North/Thomas Model of Pre-1500 Europe." *Explorations in Economic History* 18: 174–98.
- Friedman, M. (1953) "The Methodology of Positive Economics." In M. Friedman, *Essays in Positive Economics*. Chicago: University of Chicago Press.

- Grantham, G. (1999) "Contra Ricardo: On the Macroeconomics of Pre-Industrial Economies." *European Review of Economic History* 2: 199–232.
- Hayek, F. (1945) "The Use of Knowledge in Society." *American Economic Review* 35: 519–30.
- (1973) "The Place of Menger's Grundsätze in the History of Economic Thought." In J. R. Hicks and W. Weber (eds.) *Carl Menger and the Austrian School of Economics*. Oxford: Clarendon Press.
- Heiner, R. (1983) "The Origins of Predictable Behavior." *American Economic Review* 83: 560–95.
- Hicks, J. R. (1939) *Value and Capital; An Inquiry into Some Fundamental Principles of Economic Theory*. Oxford: Clarendon Press.
- Hirschman, A. O. (1987) "Linkages." In J. Eatwell, M. Milgate, and P. Newman (eds.) *The New Palgrave: A Dictionary of Economics*. London: Macmillan.
- Jacobs, J. (1969) *The Economy of Cities*. New York: Vintage Books.
- Jensen, M. C. (1983) "Organization Theory and Methodology." *Accounting Review* 58: 319–39.
- Jones, E. L. (2000) *Growth Recurring: Economic Change in World History*. Ann Arbor: University of Michigan Press.
- Kahneman, D. (1994) "New Challenges to the Rationality Assumption." *Journal of Institutional and Theoretical Economics* 150: 18–36.
- Kirzner, I. M. (1985) *Discovery and the Capitalist Process*. Chicago: University of Chicago Press.
- (1997) "Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach." *Journal of Economic Literature* 35: 60–85.
- Klein, P. G. (2000) "The New Institutional Economics." In B. Bouckert and G. DeGeest (eds.) *Encyclopedia of Law and Economics*. Cheltenham, U.K.: Edward Elgar.
- Kohn, M. (1986) "Monetary Analysis, the Equilibrium Method, and Keynes's 'General Theory.'" *Journal of Political Economy* 94: 1191–1225.
- (1988) "The Finance Constraint Theory of Money: A Progress Report." Working Paper. Dartmouth College (www.dartmouth.edu/~mkohn).
- (forthcoming) *The Origins of Western Economic Success: Commerce, Finance, and Government in Pre-Industrial Europe* (www.dartmouth.edu/~mkohn).
- Krugman, P. (1992) "Toward a Counter-Counterrevolution in Development Theory." *Proceedings of the World Bank Annual Conference on Development Economics*, 15–61.
- Leijonhufvud, A. (1998) "Mr. Keynes and the Moderns." *The European Journal of the History of Economic Thought* 5: 169–88.
- (2004) "The Metamorphoses of Neoclassical Economics." In M. Bellet, S. Gloria-Palermo, and A. Zouache (eds.) *Evolution of the Market Process: Austrian and Swedish Economics*. London: Routledge.
- Littlechild, S. C. (1979) "Comment: Radical Subjectivism or Radical Subversion." In M. J. Rizzo (ed.) *Time, Uncertainty, and Disequilibrium: Exploration of Austrian Themes*. Lexington, Mass: Lexington Books.
- Makowski, L., and Ostroy, J. M. (1993) "General Equilibrium and Market Socialism: Clarifying the Logic of Competitive Markets." In P. K. Bardhan

- and J. E. Roehmer (eds.) *Market Socialism: The Current Debate*. Oxford: Oxford University Press.
- _____ (2001) "Perfect Competition and the Creativity of the Market." *Journal of Economic Literature* 39: 479–535.
- Menger, C. ([1871] 1981) *Principles of Economics*. New York: New York University Press.
- Milgrom, P., and Roberts, J. (1990) "Bargaining Costs, Influence Costs, and the Organization of Economic Activity." In J. E. Alt and K. A. Shepsle (eds.) *Perspectives on Positive Political Economy*. Cambridge: Cambridge University Press.
- _____ (1992) *Economics, Organization, and Management*. Englewood Cliffs, N.J.: Prentice–Hall.
- Mises, L. von (1949) *Human Action: A Treatise on Economics*. New Haven: Yale University Press.
- Morgenstern, O. (1972) "Thirteen Critical Points in Contemporary Economic Theory." *Journal of Economic Literature* 10: 1163–89.
- Nelson, R. (1997) "How New is New Growth Theory?" *Challenge* 40: 29–58.
- Nelson, R., and Pack, H. (1999) "The Asian Miracle and Modern Growth Theory." *Economic Journal* 109: 413–36.
- Nelson, R., and Sampat, B. N. (2001) "Making Sense of Institutions as a Factor Shaping Economic Performance." *Journal of Economic Behavior & Organization* 44: 31–54.
- Nelson, R., and Winter, S. G. (1982) *An Evolutionary Theory of Economic Change*. Cambridge, Mass: Bellknap Press of Harvard University Press.
- North, D. (1984) "Three Approaches to the Study of Institutions." In D. C. Colander (ed.) *Neoclassical Political Economy: The Analysis of Rent-Seeking and DUP Activities*. Cambridge, Mass: Ballinger.
- North, D., and Thomas, R. P. (1970) "An Economic Theory of the Growth of the Western World." *Economic History Review* 23: 1–17.
- Olson, M. (1996) "Big Bills Left on the Sidewalk: Why Some Nations Are Rich, and Others Poor." *Journal of Economic Perspectives* 10: 3–24.
- _____ (2000) *Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships*. New York: Basic Books.
- Papandreou, A. A. (1994) *Externality and Institutions*. Oxford: Clarendon Press.
- Posner, R. A. (1993) "The New Institutional Economics Meets Law and Economics." *Journal of Institutional and Theoretical Economics* 149: 73–87.
- _____ (2002) *Economic Analysis of the Law*. 6th ed. Boston: Little, Brown.
- Ricardo, D. (1817) *On the Principles of Political Economy and Taxation*. London: J. Murray.
- Romer, C. D., and Romer, D. H. (1994) "What Ends Recessions?" In S. Fischer and J. J. Rotemberg (eds.) *NBER Macroeconomics Annual 1994*. Cambridge, Mass: MIT Press.
- Romer, P. (1986) "Increasing Returns and Long-Run Growth." *Journal of Political Economy* 94: 1002–37.
- _____ (1994) "New Goods, Old Theory, and the Welfare Costs of Trade Restrictions." *Journal of Development Economics* 43: 5–38.

- Rosenberg, N. (1960) "Some Institutional Aspects of the Wealth of Nations." *Journal of Political Economy* 68: 557–70.
- Rutherford, M. (1994) *Institutions in Economics: The Old and the New Institutionalism*. Cambridge: Cambridge University Press.
- Samuelson, P. A. (1947) *Foundations of Economic Analysis*. Cambridge, Mass: Harvard University Press.
- Schumpeter, J. A. (1942) *Capitalism, Socialism and Democracy*. New York: Harper.
- Shleifer, A.; Glaeser, E. L.; et al. (2003) "The New Comparative Economics." Working Paper. Harvard Institute for Economic Research, Cambridge, Mass.
- Simon, H. (1957) *Models of Man*. New York: Wiley.
- Smith, A. ([1776] 1976) *An Inquiry into the Nature and Causes of the Wealth of Nations*. Chicago: University of Chicago Press.
- Solow, R. (1997) "How Did Economics Get That Way and What Way Is It?" *Daedalus* 126: 39–58.
- (1970) *Growth Theory: An Exposition*. New York: Oxford University Press.
- Summers, L. H. (1991) "The Scientific Illusion in Empirical Macroeconomics." *Scandinavian Journal of Economics* 93 (2): 129–48.
- Szostak, R. (1991) *The Role of Transportation in the Industrial Revolution: A Comparison of England and France*. Montreal: McGill–Queen's University Press.
- (1999) *Econ-art: Divorcing Art from Science in Modern Economics*. London: Pluto Press.
- Thaler, R. H. (2000) "From Homo Economicus to Homo Sapiens." *Journal of Economic Perspectives* 14: 133–41.
- Tullock, G. (1989) *The Economics of Special Privilege and Rent Seeking*. Boston: Kluwer Academic Publishers.
- Vaughn, K. I. (1994) *Austrian Economics in America: The Migration of a Tradition*. Cambridge: Cambridge University Press.
- Wallis, J. J., and North, D. C. (1986) "Measuring the Transaction Sector in the American Economy, 1870–1970." In S. L. Engerman and R. E. Gallman (eds.) *Long-Term Factors in American Economic Growth*. Chicago: University of Chicago Press.
- Williamson, O. E. (1993) "Transaction Cost Economics Meets Posnerian Law and Economics." *Journal of Institutional and Theoretical Economics* 149: 99–118.
- Wolfram, S. (2002) *A New Kind of Science*. Champaign, Ill.: Wolfram Media.
- Young, A. (1995) "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience." *Quarterly Journal of Economics* 110: 641–80.