ECONOMICS AS A HISTORICAL SCIENCE

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ABSTRACT: As science deals with invariants and history with dated events, the phrase "historical science" might be thought to be an oxymoron. However, the prevalence in the natural sciences and economics of differential equations filled with time derivatives should persuade us of the legitimacy of joining history with science. The combination can, in fact, take several forms. This paper examines some of the ways in which history and economics can be fashioned into economic history, and the reasons why they need to be so joined.

A particularly important source of historicity in economics is that boundedly rational economic actors represent the economic scene in radically different ways from time to time, and these changes occur as a function of natural and social events, social influences on perception, and the molding of human motives by the social environment, which is itself time dependent. For these and other reasons, many of them bound closely to basic human characteristics, the dynamic movements of the economic system depend not only on invariant laws, but on continually changing boundary conditions as well.

Keywords: Economics, historical science, historicity, bounded rationality, dynamic movements.

CONTENTS

1. Introduction

Everyone knows what history is and what science is, but the meaning of "historical science" is less obvious. To be historical, a science must, at least, be concerned with dated events -their occurrence, their prediction,

and their explanation. "When was Charlemagne crowned?", "When will there be more computers than people in the world?", "Why (or how) did the American colonists revolt from Britain?"

Cosmology, geology, and evolutionary biology, as usually defined, qualify as historical sciences in this sense, for cosmology is concerned with the date of the Big Bang, the date when the next solar eclipse will occur, and the frequency with which the Earth is struck by meteors; geology is concerned with the date of the Wisconsin glaciation, the date of the next Ice Age, and the mechanisms of continental drift. Evolutionary biology is concerned with the date of first appearance of mammals, the size of the human population in 2050, and the mechanisms that produced a dozen new phyla of multi-celled animals at the beginning of the Cretaceous Era.

But from another standpoint, cosmology (alias astrophysics), geology (alias geophysics) and evolutionary biology (alias theory of evolution) are time-independent sciences; for they aspire to (and sometimes discover) descriptive and explanatory laws that are invariant over time: laws often in the form of systems of differential equations. They discover general relativity, continental plate theory, the survival of the fittest genes. Of course the laws are time-subscripted -they make assertions about the state of a system at particular times- but they themselves are invariant, subject to the specification of initial and boundary conditions. It is, in fact, this combination of dated events with invariance of the governing laws that spares the phrase "historical science" from an oxymoronic fate.

The boundary between the dated and the timeless in the laws of a science depends, in turn on the boundaries of the systems to which the laws are applied. The laws of physics, taken collectively and applied to the entire Universe and the matter in it, are supposed (hoped?) to be invariant. Applied to a single planet, the movements they predict depend upon boundary conditions, which depend, in turn, on the continually changing space and matter surrounding the planet.

Nor are most laws of a science entirely general, or intended to be. Even Newtonian mechanics is a limited science that applies only to objects that are not too small (so that quantum effects are inconsequential) nor too speedy (so that the effects of special or general relativity are insignificant). Similarly, special laws of physics apply to gases, others to liquids (or even just to non-turbulent liquids), and others to various kinds of solids. The behavior of crystals and near-crystalline substances has yielded an especially rich collection of special laws in the past generation, as has the behavior of plasmas. In sciences other than physics -chemistry and biology,

for example- many or most of the laws are even more specialized. Those who view the natural sciences from the outside tend to exaggerate the generality of the laws that their practitioners actually apply to the situations they study, and economists have, in this way perhaps learned the wrong lesson from them.

2. Invariant Laws in Economics

Neoclassical economics has had aspirations (and sometimes even has expressed them (Samuelson's Nobel Address (1970) provides an example) to timelessness in the sense of the general laws of physics. Its laws sometimes take the form of differential equations that are supposed to hold at "all" times; sometimes of static equations that describe the stable equilibria or the steady states of the corresponding dynamic systems. A common form of analysis (comparative statics) is to infer the steady-state effects of altering the parameters of dynamic or static equations.

Of course formal economic analysis, like any formal analysis, acknowledges that its laws hold in the real world only in systems that satisfy specified conditions (to some acceptable approximation). In this sense the theory is tautological and can be pursued by mathematical reasoning without recourse to facts. Thus, the actors commonly have invariant utility functions and fixed (although possibly infinite) sets of alternatives. Economic transactions in the theory commonly take place in perfectly competitive markets, where uncertainty is represented by (subjective) probability distributions so that actors can maximize subjective expected utility.

The reader can supply the variants on this theme, each of which may strengthen or weaken a theory's predictions. For examples of the latter, we need only look at game theory and the theory of imperfect competition in general, where, to reach any firm conclusions, we must almost always augment the theory by greatly elaborating and specializing the usual definition of rationality to encompass the "mutual outguessing" phenomenon.

3. Contemporary Economic History

The study of the history of economic institutions and behavior has long been a special, and rather separate discipline within economics. In recent times, economic history has undergone a fundamental transformation. As recently as the first edition of *The Encyclopaedia of the Social Sciences* (1931), John Clapham defined the discipline as "a branch of institutional history, a study of the economic aspects of the social institutions of the

past." Less than forty years later, Douglass North, in his article on the same subject in the successor volume, *The International Encyclopedia of the Social Sciences* (1968), remarks that Clapham "made clear that economic theory had a minor role in economic history and 'the relationship of economic history to social history is much closer'."

North describes a "distinct change in the discipline in recent times" in its "appeal to a systematic body of theory as a source of generalization and by the equally systematic use of quantitative methods of organizing evidence." He attributes the change to three developments:

> the growing interest of economists in the study of economic growth, (...) the growing interest of economics in the more precise testing of their hypotheses, (...) [and] the growing volume of quantitative information about the past.

As spokesman for economic history, North exhibits a certain diffidence about its relation to theory. "There is no reason," he says,

> (...) why the economic historian should be limited to received theory in economics. He is free to develop and apply theory of his own. However, caution in such an endeavor is obviously essential. *The likelihood that the economic historian who is untrained in the principles of economics can derive theoretical propositions of any significance is very slim indeed* [my italics]. (...) The economic historian trained in economic theory will be well aware of the pitfalls inherent in economic analysis. Therefore, if he wishes to develop his own theoretical framework, he will take careful account of the work that has gone on before and the degree to which previous generalizations are supported by available evidence.

Later, North comments further on the limitations of theory, observing, for example, that "there is no general theory of economic growth to which the economic historian can turn in exploring this major aspect of economic history." Read in context, his statement is balanced, and cannot be faulted, but it does defer to the reigning ethos of economics in the importance it attaches to theory, even in the face of recalcitrant facts.

4. History and Comparative Statics

Comparative statics is a powerful and widely used technique of economics analysis that has important applications in history. It can be employed in at least two ways: first, as an application of the "Cleopatra's nose" approach ("What would have happened had Cleopatra's nose been a quarter inch longer?"); second, as a way of examining the effects of an historical event upon the economy. In the former kind of application, a discrete change is

introduced in order to compare two different historical sequences, one real, the other hypothetical. In the second application, the comparison evaluates a causal factor in a before-and-after scenario.

An Example: Urbanization. As a simple example of the second use of neoclassical comparative statics (urbanization during the Industrial Revolution), and its limitations, I will use a foray of my own into economic history, "*Effects of Increased Productivity upon the Ratio of Urban to Rural Population.*" A simple two-industry model (agriculture and manufacturing) was used to show that, provided that the income elasticity of demand is less for agricultural products than for manufactured products, and provided that increases in productivity are not much smaller in agriculture than in manufacturing, such increases will cause a shift of population from farms to cities. The shift will be greater if, with increased productivity in manufacturing, increased amounts of industrial capital (e.g., tractors, harvesters, fertilizers) are used to increase productivity in agriculture.

The analysis is carried out by comparing the ratio of agriculture to manufacturing in equilibrium before and after productivity in the two industries has increased. Classical assumptions are made: maximization of (aggregate) utility of the population and maximization of (aggregate) profit of each industry -a very gross approximation to neoclassical assumptions of utility maximization by individual economic actors. Wage rates are assumed equal in the two industries -a counter-factual assumption that exaggerates the historically observed mobility of labor.

The findings will hardly evoke surprise: except that they show that the *industrial* revolution required also an *agricultural* revolution, for if only manufacturing had increased in productivity and agriculture had not, the model predicts a population movement from town to country! This was not a surprise to historians (although it was to me), for they already knew that major advances in agriculture began in England before the onset of the industrial revolution.

Notice that economic theory could countenance either result: urbanization or countryfication -all depends on the relative income elasticities of the two sets of products and their relative rates of productivity increase. Hence, it cannot be said that the analysis tested economic theory; for the elasticities and productivity increases were assumed in my paper, not derived from empirical data. Perhaps more interesting is the question of the extent to which the study either required or *could* test these or other basic assumptions of neoclassical theory. The facts are consistent with that the-

ory, but also with many simpler theories that do not require strong neoclassical assumptions.

The model used in the paper assumes that, at any point in history, production functions determine the amount of agricultural products and of manufactured products the economy can (and will?) produce. Say's Law is implicit in the model, guaranteeing equality of production with consumption, and there is an assumption, or definition, that equates changes in technology with upward shifts in the production functions. It is assumed that, because of the budget constraint, demand is sensitive to income (Becker 1962), and that the income elasticity of demand for manufactured products is greater than that for agricultural products. There is no assumption at all about the competitiveness or non-competitiveness of markets, or, indeed, about the nature of the markets, if any, that are used to exchange goods. The model is highly aggregated, and says little about the rationality of actors or the consistency of their utility functions.

If we wished to test any of the model's assumptions, the tests could be made, at least as well as in any other way, by direct examination of aggregate data on production, consumption and prices at various points in time. Whatever the data showed, they would provide almost no specific support for the important features of neoclassical theory: for example, for the assumptions that consumers maximize expected utility or firms, profits.

To show this, let us see how the same empirical findings could be explained by a non-maximizing model. (1) By assumption about relative income elasticities of demand, as productivity increases the consumption of manufactures will increase more rapidly than the consumption of agricultural products. Utility maximization is neither a necessary nor a sufficient condition for this assumption to hold. (2) Assume next that producers will increase supply as long as their costs are covered. Again, this is a weaker assumption than profit maximization: it would hold, for example, in any regime of markup (cost plus) pricing. (3) Suppose that productivity increases at the same rate in both agriculture and manufacturing. Then it is obvious that the new consumption pattern, demanding a greater increase of manufactured than of agricultural products, will require a shift from agricultural to manufacturing employment.

Incidentally, as was early noted by Theodore Schultz, the central conclusion that the industrial revolution was, and had to be, an agricultural revolution has important implications for the theory of economic development -implications that were not always taken into account in the first decades after World War II, when many investigators nearly equated

"economic development" in third world countries with "industrial development."

Other Examples of Comparative Statics. This particular, and simple, example is not atypical of the kinds of relations between theory and fact that are tested by data from economic history. One well-known example is Fogel's *Railroads and American Economic Growth,* which asked whether railroads, at the time of their appearance, were substantially cheaper than other existing forms of transportation. Evidence that they were not cheaper would challenge any economic theory based on profit maximizing or equating of opportunity costs. Evidence that they were cheaper would, much like the agriculture example, provide a causal mechanism for the rapid economic development observed at that time. Economic development without substantial cost reduction by rail transportation would not refute theory, however, because the observed development might be attributable to other causes.

The same author's *Time on the Cross* examined whether, at the time of the Civil War, slavery was profitable to the slave holders. The method of comparative statics in the context of neoclassical theory (but also in the context of weaker theories) would predict that the continuation of slavery would depend on profitability if exogenous forces did not interfere. A similar comparative analysis is found in Douglass North's study, determining the extent to which monopoly could increase profits in monopolized and competitive industries at the expense of the incomes of farmers and workers.

My intent is not to trivialize these studies. Rather, I use them to emphasize that economic history frequently deals with important questions whose answers do not depend upon the stronger assumptions of neoclassical theory. Although, as in my rural/urban example, neoclassical (or roughly approximate neoclassical) models are often built and compared with data, the consistency of data with model should not too easily be taken as confirming the model. In the cases we have looked at, the data can be accounted for on assumptions much weaker and simpler than the neoclassical ones. Typical essential, but bland, assumptions are that business firms must cover their costs and that production equals consumption plus investment (Say's Law); utility and profit maximization play little or no essential role in the analysis.

5. Dynamics in Economic History

The method of comparative statics is a powerful tool for studying the immediate effects of large discrete events upon an economy. However, we usually think of history as a process of continuing change, something to be captured by dynamic models, like differential equation models for predicting business cycles and other movements in economic activity. This is especially important because, through capital investment, initial impulses can be expected to have cumulate effects on production over time.

Technological Change. In studying technological change, a topic of central importance in economic history, ancient and modern, comparative statics and dynamics can often be combined productively. Again, I will use an example from work in which I was involved. Shortly after World War II, the Cowles Commission for Research in Economics, was asked to make a study of the potential economic effects of nuclear power (Schurr and Marschak (eds.) 1960). At the heart of the study was an estimate of the cost saving from nuclear power, based on the assumption that costs would be quite comparable to those from fossil fuels, except that the atomic fuel would itself be essentially costless (an overoptimistic assumption, as it turned out, but one that could place an upper bound on effects).

The bulk of the study was carried out within the framework of comparative statics, and showed that the introduction of nuclear energy would produce, at best, a very modest increase in productivity (about 4/10 of one per cent above the current rate of increase). (By hindsight, even this increase proved overoptimistic, largely because of the added costs of providing adequate protection from radiation and melt-down, and the costs of disposing of radioactive wastes.) However, this estimate must be modified to take into account the cumulative effect upon economic growth of a 4/10% increment to the annual rate of productivity increase. Compound interest gradually makes large effects out of small ones.

As in the studies previously examined, the only rationality assumption the nuclear power study required was that a particular energy source will be used whenever and wherever it is more economical than the alternatives. Nor is any economic explanation provided as to why this particular innovation occurred at a specific point in history, or as to the particular structure of its cost function. All of these variables were exogenous to the inquiry, the first cause being the wartime effort to produce a nuclear weapon. The analysis also ignored the emotions engendered by concerns about possible diversions of nuclear materials to military or terroristic use, and

about the long-term environmental problems created by nuclear power generation. Thus, a purely economic analysis, while useful in providing a part of the total picture, necessarily fell far short of dealing with nuclear developments in their broader social setting.

The Institutional Context. Technological change is just one particular example of an exogenous factor that affects the continuing development of an economic system. It can, "in principle," be endogenized by building a theory of economic forces (in the cases where the forces *are* economic) that determine the rate of technological innovation -for example, by including in the dynamic model an equation for rate of innovation. Rates of investment in R&D and in education and training can be independent variables in such an equation -which leads back to the question of what determines these rates. To assert that expected profits will control them brings them back within the fold of classical theory, but without any particular procedure for generating the expectations.

Moreover, as the nuclear energy example illustrates, many factors besides expected profits influence investment in a particular technology. In the postwar history of the United States, one might hypothesize that the rate of investment in innovation, especially through scientific discovery, has been much more strongly influenced by defence policy and recognition of the public goods aspects of basic discoveries than it has by expectations of private profit. Clearly, any clarification of such matters will lead from careful historical fact-gathering back to theory, and not in the opposite direction.

Moreover, in the past half-century, there have been important changes in the spending of American industry for research and development -first a rapid increase, then stabilization and an equally rapid decline. The economic historian can gather facts to check these trends and their magnitudes. The economic theorist can postulate that the changes in level of R&D investment reflect changes in expectations about their profitability. Again, we are then driven back to explaining how these changes in expectations came about, and -apart from some unverifiable, and probably invalid, hypotheses that they were a product of "experience," it is hard to find anything that theory has to say about the matter.

At least as plausible as the "experience" hypothesis is that the shifts resulted from the diffusion of waves of public (or corporate) opinion. This is about as useful as explaining changes in fashions as produced by fads. (Exactly the same thing can be said about the economics of "downsizing,"

or the fad that brought "Total Quality Management" into industry at a particular moment in the 1990's.) All of these events are grist for the mill of economic history, but they have little to do with classical economic theory beyond providing exogenous inputs to its models.

J.M. Keynes' account of investment rates in terms of "animal spirits" (which was, to be sure, only one of his independent variables) belongs to the same family. The trouble is not that the explanation is wrong; it may very well be true. Nor is the trouble that human optimism and pessimism cannot be measured: polling techniques are aimed at capturing just such phenomena. The real source of difficulty is that we must call upon these variables as independent, exogenous variables that are not themselves determined by the previous state of the system, as a closed dynamics would require.

I shall not attempt to provide a catalogue of all of the exogenous variables we would have to call upon to implement a dynamic model of an evolving economy. In the literature of economic development, we find population growth and rate of capital investment among the key variables. These can be, and sometimes are, endogenized, but only by invoking regularities from past experience, not by deducing them from theoretical premises.

Population growth, for example, might be predicted (although not with very much accuracy) from income levels; and this prediction might be rationalized, in turn, from an economic analysis of the value of children to their parents. The issue becomes more complicated when we distinguish between educated and uneducated children, for if the former, but not the latter, are a good parental investment, then we must introduce imperfect capital markets to place limits on borrowing for the purpose of financing more "profitable" children. As a last resort, we can turn to changes in taste (i.e., changes in the utility function) as a result of urbanization and cultural modernization. The possibilities are so numerous, and so hard to nail down empirically that it is not clear what useful work theory is doing for us.

In a similar way, capital investment might be predicted from total income and savings rates, and a theoretical fabric woven to explain the levels of the latter. Historical research can tell us which of these explanations is consistent with the historical record, but can seldom choose a unique explanation from the wealth of available hypotheses.

Categories of Exogenous Institutional Variables. At a more abstract level, a partial catalogue of exogenous institutional variables (and candidates for

endogenization) would include: (1) changes in the utility function, with consequent changes in demand and in savings rates; (2) changes in the production function, resulting from technological change and other factors, and with consequent changes in supply; and (3) changes in the laws of property, with consequent effects upon positive and negative externalities, the appropriability of inventions and powers of government to redistribute income and wealth. The public choice approach represents an attempt to endogenize these latter kinds of variables, but I shall not comment here on the extent to which it has succeeded or is likely to succeed. You can judge from what I have already said that am not sanguine.

6. Bounded Rationality and Economic Dynamics

The variables considered thus far are all consistent with the assumptions of neoclassical theory. To these we must add the variables that deal with the fact that human rationality is bounded. These additional variables are closely bound with an historical view of economics, for they take into account (1) continuing changes in knowledge and information (both knowledge about economics and other knowledge about the world), (2) changes in human ability to estimate consequences of actions, (3) changes in the institutional setting within which economic behavior takes place, (4) changes in the focus of attention and related changes in beliefs and expectations. I will add, for they belong among the belief-dependent variables, (5) changes in human altruism and (6) in group identification.

Knowledge: About Economics. The ancients, as early as the time of Aristotle, understood some basic principles of the workings of economies. They understood the advantages of a monetary economy over a barter economy, the balancing of supply and demand by markets, some of the motivational implications of private property, the efficiencies accruing from the division of labor, including the mutual gains derivable from international trade. The quantity theory of money, connecting the supply of precious metals with the price level, was widely accepted. There seem even to have been some inklings of the marginal principle. Very little that Adam Smith had to say in 1776 on these topics would have greatly surprised the ancients, although he organized what he had to say more clearly and systematically than they did, and undoubtedly understood it better.

There was much less clarity in ancient times, or for that matter, right up to quite modern times, with regard to the sources of value of goods and

services (e.g., scarcity value, versus value in use and value in exchange). I recall a whole series of lectures in Jacob Viner's theory course in the 1930's that struggled to reconcile these alternative bases for value without reference to the now "obvious" fact that finding consistent values of price and quantity requires two simultaneous constraints, one originating on the side of supply and one on the side of demand.

There was even more confusion about interest and "usury," arising out of the desire to explain economic practices while simultaneously evaluating and justifying them normatively. As the usury example shows, these struggles to understand economic phenomena were not without consequences for the economy and those who had roles in it. Applying the Cleopatra's nose principle, we can be rather certain that the history of the Jews, and other trading groups who engaged in lending money, would have been quite different if explicit interest payments had not, for a long time, been condemned as usury.

Mercantilist doctrines advocating a favorable balance of trade and the accumulation of the precious metals played a major role, during the period of their acceptance, in determining government policies of economic regulation and of imperialism and colonization. The physiocratic doctrines that succeeded them induced substantial changes in these policies, as did the still newer doctrines promulgated by *The Wealth of Nations.*

This gradual modification of economic knowledge is usually treated, under the label of "history of economic doctrine," as a chronicle of the development of economic theory by and for economists. There are, in fact, two histories, more or less parallel: one describing the changes in economic theory espoused by those who studied the subject, taught it, and wrote on it, the other describing the changes of knowledge of the participants in economic affairs, or in the affairs of governments that regulated the economy.

As Keynes explained so eloquently, there are important connections between these two histories, for

> the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed, the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back (Keynes 1936, p. 383).

Our concern here is not with the economics of economists' but with the economics of economic actors, which, as Keynes observes, is surely influ-

enced by professional theory but will seldom be identical with it. We may, for example, expect economic actors to believe, and act on the belief, that when there is a scarcity of food, food prices will rise. They can hold that belief quite independently of whether they know or believe the claims that current theory asserts about economic actors maximizing utilities and thereby equating costs and utilities at the margins.

An important task in economic history would be to trace the changes in popular economic beliefs and assess the effects of these changes upon the behavior of the economy and the course of state regulation. On the basis of casual observation, it is my impression that, until quite recently, not much of the work in economic history or the history of economic doctrine had focused attention on this topic. Of course, any study that aims at testing the tenets of neoclassical theory is implicitly testing whether the economic actors understand the theory and act on that understanding. Rational expectations theory, with its explicit assumptions about the model of the economy that rational actors hold, and game theory, with its assumptions about how each economic actor forms expectations about the actions and reactions of the other actors, have now begun to call the attention of economics more and more to these issues.

Other Knowledge and Information. The kinds of rational action predicted by theory depend not only on knowledge of economic theory but also on knowledge about facts and events in the economy and the society: about the legal system, current and expected price levels, the cost function. The evidence that human rationality is severely bounded in relation to the complexity of the world in which it finds itself demands that people operate in terms of grossly simplified models of the world. Even if they are correct as far as they go, the models contain only a tiny fraction of all the potentially important facts and relations. Expectations may be rational in relation to this internal simplified model; they are certainly not objectively rational in relation to the complexities of the actual world. To deal with real events in the world, economics must postulate, not just the state of that world, but also the knowledge the economic actors have about it.

Technological change, which begins with the invention or discovery of new alternatives, can also be regarded as a product of bounded rationality, for in a world of unlimited knowledge there would be no unknown alternatives to be discovered. As the relation is very weak between the rate at which new alternatives are found and the scale of the resources that are de-

voted to finding them, the possibilities for endogenizing this process are very limited.

Computational Powers. Limits on knowledge are compounded by limits on human abilities to derive accurately the implications of what is known. The advent of the computer has made us so conscious of these computational limits, that they require no elaborate discussion. But even the computer, however far it extends human computational powers, still is capable of modeling only the broadest features of complex situations. Again, an account of human economic behavior in any historical setting (including the present) must postulate the scale of the computational means available to aid decision making.

Institutional Setting. Economic decisions are strongly influenced by the surrounding governmental, legal, business and social institutions. As the utility function postulated by economic theory has no predetermined content, that content must be derived from the past and present natural and social environment. Some economists have tried to derive a definite utility function from evolutionary arguments that biological "fitness" is maximized, often equating fitness with income, wealth or power. This line of reasoning suffers from two problems. First, the connections between biological fitness, on the one hand, and income, wealth and power, on the other, are tenuous at best. Second, the once-accepted neo-Darwinian argument that the fitness of the "selfish gene" rules out all forms of group adaptation and individual altruism has been found wanting on a number of grounds. I will discuss the implications of altruism for economic history and theory, and especially the problems it presents to the theory of the firm and public choice theory, a little later.

Two other lines of contemporary economic reasoning, the New Institutional Economics, and Public Choice take a different path, seeking to endogenous the impact of institutions on individual choice by making the institutional forms themselves responsive to economic forces. Thus, institutional economists like Oliver Williams have scrutinized the forms of contract to show that they are functional from the standpoint of rational actors; while the public choice theorists seek to explain political behavior in terms of wealth-maximizing and power-maximizing behavior.

In the discussion of altruism, I will argue that the new institutional economics has failed to explain the central role of business organizations in the economy (arguably as central as the role of markets), or the motivational

forces that make large centralized organizations efficient and viable in competition with smaller units. As to public choice theory, terms like "wealth maximization" and "power maximization" can be fitted to almost any political behavior nearly effortlessly, unless some supportable limits are imposed on the assumptions about the ways in which voters and politicians go about estimating what choices are to their advantage. For example, to make clear predictions, the theory would have to predict which economic variables will be in the focus of voters' attentions at any given time. Without such predictions, the theory is largely a set of tautologies that neither has been nor can be tested empirically (Simon 1985).

Focus of Attention. One significant way in which bounded rationality affects the course of economic events is through the continual shifting of attention from the set of variables that play a prominent role in the economic actors' models during one period of time to another set of variables at a later period time. Such changes in the focus of attention can produce major and repeated changes in the economy.

For example, during the Fifties and Sixties, most Americans paid little attention to the price level, which rose only slowly during this period. Their focus of attention, as a result of the experience of the Great Depression and the subsequent appearance of Keynesianism, was primarily upon the level of employment and increases in productivity. Only when stagflation appeared, and their attention was attracted to the combination of stubborn residual unemployment with increasingly rapid price increases, did the possibility of uncontrolled inflation become a believable danger. Then, in the late Seventies and early Eighties, preoccupation with inflation increased to the point where higher unemployment rates became acceptable, there were strong demands for tax reduction, and little attention was paid to an unprecedented increase in the national debt and the cost of debt service.

These events, and the consequence changes in economic behavior and government policy, represent a significant modification of people's models of the economic system in which they live. Beliefs moved away from Keynesianism toward a variety of alternatives -*laissez faire*, "supply side," and libertarian- with corresponding changes in economic and political decisions. A model of perfect rationality has no place for such structural changes. Even in the framework of rational expectations, introduction of periodic alterations of the model itself would change the equilibrium toward which the economy was moving. Such shifts can be accommodated in

a model of bounded rationality -but not without facing the task of describing the process, exogenous to neoclassical economic theory, of changes in belief.

Because of this strong interaction between changing exogenous beliefs and behavior, economic history must incorporate, through either exogenous or endogenous mechanisms the continual changes in public attention that alter responses to economic events and to issues of public policy.

Altruism. As was pointed out earlier, Darwinian theory can no longer maintain that selection of the fittest extinguishes altruism. Contrary to earlier claims that only altruism to close kin can survive, a creature of bounded rationality can gain net fitness as a result of altruism induced by social influences that also enhance the fitness of the social group. Either the presence or absence of altruism in the utility function is consistent with neoclassical theory and many other theories, but of course, is not without major consequences for behavior.

We now know that natural selection at the level of social groups can be linked with selection at the level of the gene by several mechanisms. Among them are the application of social sanctions to the individual, the mechanism of structured demes (see David Sloan Wilson for an discussion of this rather complex but powerful mechanism), and bounded rationality itself, which makes it advantageous for individuals to accept social instruction and advice (to be educable or "docile") even though the advice sometimes counsels behavior that reduces fitness (Simon 1990). All of these mechanisms support individual altruistic behavior when it enhances the average fitness of members of some group to which the individual belongs.

Most economic theory operates on the assumption that utility attaches almost exclusively to individual selfish economic motives. People are assumed to have desires to consume goods and services and to save for future consumption, and they prefer leisure to work. (Sometimes an "estate motive" is included in the utility function, but its origins -unless it derives from altruism to close kin- are not apparent.)

The New Institutional Economics assumes that an employee's motivation to work for organizational goals derives from wage, salary and bonus rewards and expectations of promotion. The motivation is only sustainable, according to the theory, to the extent that performance can be enforced by making the rewards contingent on it. To determine when activities will be handled inside firms and when they will be out-sourced, the costs of enforcing the explicit and implicit terms of the employment con-

tract must be balanced against the costs of enforcing market contracts, and the transaction (information) costs of carrying out activities within the firm, balanced against transaction costs between independent contractors. Thus, conclusions about when privatization will or won't be advantageous, and where the balance will be struck between firms and external sourcing, depend critically upon the values of these empirical parameters.

However, there are important theoretical reasons supported by substantial empirical evidence, to believe that the usual explicit rewards associated with employment are not the only, and very likely not the major factors that motivate managers and other employees to direct their decisions toward organizational goals. Evolutionary forces have produced in human beings a strong propensity (sometimes called docility) to accept instruction, advice and authority when it emanates from socially legitimized sources. I have provided elsewhere (Simon 1990) the argument that leads to this conclusion. One aspect of docility is a considerable tendency for people to identify with (acquire loyalty to) the social groups, including the organizations, to which they belong.

Group Identification. The strength of group identification and the nature of the groups that command strong loyalties undergo large changes in the course of history. Identification with the nation state is largely a product of the past two or three centuries, while ethnic loyalty (which is itself a varying blend of identification based on ethnicity, religion, race, and possibly other factors) and family identification were already well entrenched at the dawn of recorded history. Identification with military groups, although often mingled with ethnic and national identification, can often be seen in the historical comings and goings of armies. *Xenophon* is most instructive when read from this standpoint, and the *Iliad* provides us with considerable data on the conflicts of loyalties in Greek society, and their effects on decision making.

A striking modern phenomena is the identification of executives and other employees with the business firms or other organizations for whom they work. It has both a motivational and a cognitive component. On the motivational side, it provides a basis of attachment to organizational goals that goes far beyond that provided by enforceable rewards; but more than motivation is involved. In our human world of bounded rationality, organizational identification is a major mechanism for focusing attention on those aspects of a situation that are relevant to organizational survival and

success, and consequently for reaching decisions that advance organizational goals.

The presence of organizational identifications substantially reduces the costs of maintaining adherence to organizational goals, and enlarges the area of activity within which organizations will have an advantage over markets. The rise of the large modern business firm is often attributed in considerable part to the efficiencies deriving from specialization and the division of labor. But as can be seen from the pages of Adam Smith, many of these advantages can be obtained as easily through the putting-out system or other forms of contracting as by forming and managing large organizations. In fact, out-sourcing to specialized firms that supply more than one company can greatly enhance specialization. Adam Smith himself was strongly critical (on grounds of the presumably selfish motives of non-owner executives) of the idea that corporations could carry on efficient economic activities, and would surely be astonished at the form that capitalism has assumed.

The trust engendered by ethnic and family loyalties is frequently advanced as a basis for the success and survival of geographically dispersed trading and banking organizations. Similarly, the modern corporation encounters special difficulties in cultures where loyalty to an extended family competes with organizational loyalties.

Identification, in both its cognitive and motivational aspects, is an exogenous variable that plays an essential role in forming the shape of economic institutions in a given culture, and hence a variable that cannot be omitted from economic history or economic theory.

7. Conclusion

Economic activity takes place in a complex natural and social environment only a small part of whose behavior can be endogenized within the body of economic theory (or even within the whole body of scientific theory). To the extent that this environment remains exogenous, the laws of economics cannot have even that degree of universality and invariance that is possessed by, say, Newtonian mechanics. Its laws will continue to change with changes in social institutions and changes in the knowledge and beliefs of the boundedly rational people who inhabit them. The focus of individual and public attention will shift with changing events from one set of variables to another, with resulting shifts in individual and system behavior.

For all of these and the other reasons adduced in this paper, economic science has and will continue to have an important historical component. Economic historians have been perhaps too modest in recent times about the role they have to play in establishing our economic knowledge. Their task is much more than one of explaining historical events in terms of an independently derived body of economic theory. It is much more than one of testing empirically a theory that has already been formulated. The data assembled and analysed by historians is, in fact, essential for our understanding economic behavior and formulating empirically valid economic laws, including mechanisms that continually alter these laws with the changing knowledge, beliefs, perceptions, values and identifications of the human economic actors.

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