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Economic Performance Through Time†

By DOUGLASS C. NORTH*

I

Economic history is about the performance of economies through time. The objective of research in the field is not only to shed new light on the economic past, but also to contribute to economic theory by providing an analytical framework that will enable us to understand economic change. A theory of economic dynamics comparable in precision to general equilibrium theory would be the ideal tool of analysis. In the absence of such a theory we can describe the characteristics of past economies, examine the performance of economies at various times, and engage in comparative static analysis; but missing is an analytical understanding of the way economies evolve through time.

A theory of economic dynamics is also crucial for the field of economic development. There is no mystery why the field of development has failed to develop during the five decades since the end of World War II. Neoclassical theory is simply an inappropriate tool to analyze and prescribe policies that will induce development. It is concerned with the operation of markets, not with how markets develop. How can one prescribe policies when one doesn't understand how economies develop? The very methods employed by neoclassical economists have dictated the subject matter and militated against such a development. That theory in the pristine form that gave it mathematical precision and elegance modeled a frictionless and static world. When applied to economic history and development it focused on technological development and more recently human-capital investment but ignored the incentive structure embodied in institutions that determined the extent of societal investment in those factors. In the analysis of economic performance through time it contained two erroneous assumptions: (i) that institutions do not matter and (ii) that time does not matter.

This essay is about institutions and time. It does not provide a theory of economic dynamics comparable to general equilibrium theory. We do not have such a theory.[1] Rather it provides the initial scaffolding of an analytical framework capable of increasing our understanding of the historical evolution of economies and a necessarily crude guide to policy in the ongoing task of improving the economic performance of economies. The analytical framework is a modification of neoclassical theory. What it retains is the fundamental assumption of scarcity and hence competition and the analytical tools of microeconomic theory. What it modifies is the rationality assumption. What it adds is the dimension of time.

Institutions form the incentive structure of a society, and the political and economic institutions, in consequence, are the underlying determinants of economic performance. Time as it relates to economic and

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[1]In fact such a theory is unlikely. I refer the reader to Frank Hahn's prediction about the future of economic theory (Hahn, 1991).

societal change is the dimension in which the learning process of human beings shapes the way institutions evolve. That is, the beliefs that individuals, groups, and societies hold which determine choices are a consequence of learning through time—not just the span of an individual's life or of a generation of a society, but the learning embodied in individuals, groups, and societies that is cumulative through time and passed on intergenerationally by the culture of a society.

The next two sections of this essay summarize the work I, and others, have done on the nature of institutions and the way they affect economic performance (Section II) and then characterize the nature of institutional change (Section III).[2] The remaining four sections describe a cognitive-science approach to human learning (Section IV); provide an institutional/cognitive approach to economic history (Section V); indicate the implications of this approach for improving our understanding of the past (Section VI); and finally suggest implications for current development policies (Section VII).

II

Institutions are the humanly devised constraints that structure human interaction. They are made up of formal constraints (e.g., rules, laws, constitutions), informal constraints (e.g., norms of behavior, conventions, self-imposed codes of conduct), and their enforcement characteristics. Together they define the incentive structure of societies and specifically economies.

Institutions and the technology employed determine the transaction and transformation costs that add up to the costs of production. It was Ronald Coase (1960) who made the crucial connection between institutions, transaction costs, and neoclassical theory. The neoclassical result of efficient markets only obtains when it is costless to transact. Only under the conditions of costless bargaining will the actors reach the solution that maximizes aggregate income regardless of the institutional arrangements. When it is costly to transact, then institutions matter. And it is costly to transact. John J. Wallis and North (1986) demonstrated in an empirical study that 45 percent of U.S. GNP was devoted to the transaction sector in 1970. Efficient markets are created in the real world when competition is strong enough via arbitrage and efficient information feedback to approximate the Coase zero-transaction-cost conditions and the parties can realize the gains from trade inherent in the neoclassical argument.

But the informational and institutional requirements necessary to achieve such efficient markets are stringent. Players must not only have objectives, but know the correct way to achieve them. But how do the players know the correct way to achieve their objectives? The instrumental rationality answer is that, even though the actors may initially have diverse and erroneous models, the informational feedback process and arbitraging actors will correct initially incorrect models, punish deviant behavior, and lead surviving players to correct models.

An even more stringent implicit requirement of the discipline-of-the-competitive-market model is that, when there are significant transaction costs, the consequent institutions of the market will be designed to induce the actors to acquire the essential information that will lead them to correct their models. The implication is not only that institutions are designed to achieve efficient outcomes, but that they can be ignored in economic analysis because they play no independent role in economic performance.

These are stringent requirements that are realized only very exceptionally. Individuals typically act on incomplete information and with subjectively derived models that are frequently erroneous; the information feedback is typically insufficient to correct these subjective models. Institutions are not necessarily or even usually created to be socially efficient; rather they, or at least the

[2] These two sections briefly summarize material contained in North (1990a).

formal rules, are created to serve the interests of those with the bargaining power to create new rules. In a world of zero transaction costs, bargaining strength does not affect the efficiency of outcomes; but in a world of positive transaction costs it does.

It is exceptional to find economic markets that approximate the conditions necessary for efficiency. It is impossible to find political markets that do. The reason is straightforward. Transaction costs are the costs of specifying what is being exchanged and of enforcing the consequent agreements. In economic markets what is being specified (measured) is the valuable attributes—the physical and property-rights dimensions—of goods and services or the performance of agents. While measurement can frequently be costly, there are some standard criteria: the physical dimensions have objective characteristics (size, weight, color, etc.), and the property-rights dimensions are defined in legal terms. Competition also plays a critical role in reducing enforcement costs. The judicial system provides coercive enforcement. Still, economic markets in the past and present are typically imperfect and beset by high transaction costs.

Measuring and enforcing agreements in political markets is far more difficult. What is being exchanged (between constituents and legislators in a democracy) is promises for votes. The voter has little incentive to become informed because the likelihood that one's vote matters is infinitesimal; further, the complexity of the issues produces genuine uncertainty. Enforcement of political agreements is beset by difficulties. Competition is far less effective than in economic markets. For a variety of simple, easy-to-measure, and important-to-constituent-well-being policies, constituents may be well informed, but beyond such straightforward policy issues ideological stereotyping takes over and (as I shall argue below in Section IV) shapes the consequent performance of economies.[3] It is the polity that defines and enforces property rights, and in consequence it is not surprising that efficient economic markets are so exceptional.

[3]See the author's "A Transaction Cost Theory of Politics" for a transaction-cost approach to the relative inefficiency of political markets (North, 1990b).

III

It is the interaction between institutions and organizations that shapes the institutional evolution of an economy. If institutions are the rules of the game, organizations and their entrepreneurs are the players.

Organizations are made up of groups of individuals bound together by some common purpose to achieve certain objectives. Organizations include political bodies (e.g., political parties, the Senate, a city council, regulatory bodies), economic bodies (e.g., firms, trade unions, family farms, cooperatives) social bodies (e.g., churches, clubs, athletic associations), and educational bodies (e.g., schools, universities, vocational training centers).

The organizations that come into existence will reflect the opportunities provided by the institutional matrix. That is, if the institutional framework rewards piracy then piratical organizations will come into existence; and if the institutional framework rewards productive activities then organizations—firms—will come into existence to engage in productive activities.

Economic change is a ubiquitous, ongoing, incremental process that is a consequence of the choices individual actors and entrepreneurs of organizations are making every day. While the vast majority of these decisions are routine (Richard Nelson and Sidney G. Winter, 1982), some involve altering existing "contracts" between individuals and organizations. Sometimes that recontracting can be accomplished within the existing structure of property rights and political rules; but sometimes new contracting forms require an alteration in the rules. Equally, norms of behavior that guide exchanges will gradually be modified or wither away. In both instances, institutions are being altered.

Modifications occur because individuals perceive that they could do better by restructuring exchanges (political or eco-

nomic). The source of the changed perceptions may be exogenous to the economy—for instance a change in the price or quality of a competitive product in another economy that alters perceptions of entrepreneurs in the given economy about profitable opportunities. But the most fundamental long-run source of change is learning by individuals and entrepreneurs of organizations.

While idle curiosity will result in learning, the rate of learning will reflect the intensity of competition among organizations. Competition, reflecting ubiquitous scarcity, induces organizations to engage in learning to survive. The degree of competition can and does vary. The greater the degree of monopoly power, the lower is the incentive to learn.

The speed of economic change is a function of the rate of learning, but the direction of that change is a function of the expected payoffs to acquiring different kinds of knowledge. The mental models that the players develop shape perceptions about the payoffs.

IV

It is necessary to dismantle the rationality assumption underlying economic theory in order to approach constructively the nature of human learning. History demonstrates that ideas, ideologies, myths, dogmas, and prejudices matter; and an understanding of the way they evolve is necessary for further progress in developing a framework to understand societal change. The rational-choice framework assumes that individuals know what is in their self-interest and act accordingly. That may be correct for individuals making choices in the highly developed markets of modern economies,[4] but it is patently false in making choices under conditions of uncertainty—the conditions that have characterized the political and economic choices that shaped (and continue to shape) historical change.

Herbert Simon (1986 pp. S210–11) has stated the issues succinctly:

> If...we accept the proposition that both the knowledge and the computational power of the decisionmaker are severely limited, then we must distinguish between the real world and the actor's perception of it and reasoning about it. That is to say we must construct a theory (and test it empirically) of the process of decision. Our theory must include not only the reasoning processes but also the processes that generated the actor's subjective representation of the decision problem, his or her frame.

The analytical framework we must build must originate in an understanding of how human learning takes place. We have a way to go before we can construct such a theory, but cognitive science has made immense strides in recent years—enough strides to suggest a tentative approach that can help us understand decision-making under uncertainty.[5]

Learning entails developing a structure by which to interpret the varied signals received by the senses. The initial architecture of the structure is genetic, but the subsequent scaffolding is a result of the experiences of the individual. The experiences can be classified into two kinds—those from the physical environment and those from the socio-cultural linguistic environment. The structures consist of categories—classifications that gradually evolve from earliest childhood to organize our perceptions and keep track of our memory of analytic results and experiences. Building on these classifications, we form mental models to explain and interpret the environment—typically in

[4]However, see the anomalies even here in the studies by Amos Tversky and Daniel Kahneman (1986) and others (Robin M. Hogarth and Melvin W. Reder, 1986).

[5]See John H. Holland et al. (1986) for an excellent introduction to the cognitive-science literature.

ways relevant to some goal. Both the categories and the mental models will evolve, reflecting the feedback derived from new experiences: feedback that sometimes strengthens our initial categories and models or may lead to modifications—in short, learning. Thus the mental models may be continually redefined with new experiences, including contact with others' ideas.

At this juncture the learning process of human beings diverges from that of other animals (such as the sea slug—a favorite research subject of cognitive scientists) and particularly diverges from the computer analogy that dominated early studies of artificial intelligence. The mind appears to order and reorder the mental models from their special-purpose origins to successively more abstract forms so that they become available to process other information. The term used by Andy Clark and Annette Karmiloff-Smith (1993) is "representational redescription." The capacity to generalize from the particular to the general and to use analogy is a part of this redescription process. It is this capacity that is the source not only of creative thinking, but also of the ideologies and belief systems that underlie the choices humans make.[6]

A common cultural heritage provides a means of reducing the divergence in the mental models that people in a society have and constitutes the means for the intergenerational transfer of unifying perceptions. In pre-modern societies cultural learning provided a means of internal communication; it also provided shared explanations for phenomena outside the immediate experiences of the members of society in the form of religions, myths, and dogmas. Such belief structures are not, however, confined to primitive societies, but are an essential part of modern societies as well.

Belief structures get transformed into societal and economic structures by institutions—both formal rules and informal norms of behavior. The relationship between mental models and institutions is an intimate one. Mental models are the internal representations that individual cognitive systems create to interpret the environment; institutions are the external (to the mind) mechanisms individuals create to structure and order the environment.

V

There is no guarantee that the beliefs and institutions that evolve through time will produce economic growth. Let me pose the issue that time presents us by a brief institutional/cognitive story of long-run economic/political change.

As tribes evolved in different physical environments, they developed different languages and, with different experiences, different mental models to explain the world around them. The languages and mental models formed the informal constraints that defined the institutional framework of the tribe and were passed down intergenerationally as customs, taboos, and myths that provided cultural continuity.[7]

With growing specialization and division of labor, the tribes evolved into polities and economies; the diversity of experience and learning produced increasingly different societies and civilizations with different degrees of success in solving the fundamental economic problems of scarcity. The reason is that as the complexity of the environment increased as human beings became increasingly interdependent, more complex institutional structures were necessary to capture the potential gains from trade. Such evolution requires that the society develop institutions that will permit anonymous, impersonal exchange across time and space. To the extent that the culture and local experiences had produced diverse institutions and belief systems with respect to the gains from

[6]Ideologies are shared frameworks of mental models that groups of individuals possess that provide both an interpretation of the environment and a prescription as to how that environment should be ordered.

[7]Ronald Heiner (1983), in a path-breaking article, not only made the connection between the mental capacities of humans and the external environment, but suggested the implications for arresting economic progress.

such cooperation, the likelihood of creating the necessary institutions to capture the gains from trade of more complex contracting varied. In fact, most societies throughout history got "stuck" in an institutional matrix that did not evolve into the impersonal exchange essential to capturing the productivity gains that came from the specialization and division of labor that have produced the Wealth of Nations.

The key to the foregoing story is the kind of learning that the individuals in a society acquired through time. Time in this context entails not only current experiences and learning, but also the cumulative experience of past generations that is embodied in culture. Collective learning—a term used by Friedrich A. Hayek—consists of those experiences that have passed the slow test of time and are embodied in our language, institutions, technology, and ways of doing things. It is "the transmission in time of our accumulated stock of knowledge" (Hayek, 1960 p. 27). It is culture that provides the key to path dependence—a term used to describe the powerful influence of the past on the present and future. The current learning of any generation takes place within the context of the perceptions derived from collective learning. Learning then is an incremental process filtered by the culture of a society which determines the perceived payoffs, but there is no guarantee that the cumulative past experience of a society will necessarily fit them to solve new problems. Societies that get "stuck" embody belief systems and institutions that fail to confront and solve new problems of societal complexity.

We need to understand a great deal more about the cumulative learning of a society. The learning process appears to be a function of (i) the way in which a given belief structure filters the information derived from experiences and (ii) the different experiences confronting individuals and societies at different times. The perceived rate of return (private) may be high to military technology (in medieval Europe), to the pursuit and refinement of religious dogma (Rome during and after Constantine), or to the research for an accurate chronometer to determine longitude at sea (for which a substantial reward was offered during the Age of Exploration).

The incentives to acquire pure knowledge, the essential underpinning of modern economic growth, are affected by monetary rewards and punishments; they are also fundamentally influenced by a society's tolerance of creative developments, as a long list of creative individuals from Galileo to Darwin could attest. While there is a substantial literature on the origins and development of science, very little of it deals with the links between institutional structure, belief systems, and the incentives and disincentives to acquire pure knowledge. A major factor in the development of Western Europe was the gradual perception of the utility of research in pure science.

Incentives embodied in belief systems as expressed in institutions determine economic performance through time, and however we wish to define economic performance the historical record is clear. Throughout most of history and for most societies in the past and present, economic performance has been anything but satisfactory. Human beings have, by trial and error, learned how to make economies perform better; but not only has this learning taken ten millenia (since the first economic revolution), it has still escaped the grasp of almost half of the world's population. Moreover the radical improvement in economic performance, even when narrowly defined as material well-being, is a modern phenomenon of the last few centuries and confined until the last few decades to a small part of the world. Explaining the pace and direction of economic change throughout history presents a major puzzle.

Let us represent the human experience to date as a 24-hour clock in which the beginning consists of the time (apparently in Africa between 4 and 5 million years ago) when humans became separate from other primates. Then the beginning of so-called civilization occurs with the development of agriculture and permanent settlement in about 8000 B.C. in the Fertile Crescent—in the last three or four minutes of the clock. For the other 23 hours and 56 or 57 min-

utes, humans remained hunters and gatherers, and while population grew, it did so at a very slow pace.

Now if we make a new 24-hour clock for the time of civilization—the 10,000 years from development of agriculture to the present—the pace of change appears to be very slow for the first 12 hours, although our archeological knowledge is very limited. Historical demographers speculate that the rate of population growth may have doubled as compared to the previous era but still was very slow. The pace of change accelerates in the past 5,000 years with the rise and then decline of economies and civilizations. Population may have grown from about 300 million at the time of Christ to about 800 million by 1750—a substantial acceleration as compared to earlier rates of growth. The last 250 years—just 35 minutes on our new 24-hour clock—are the era of modern economic growth, accompanied by a population explosion that now puts world population in excess of 5 billion.

If we focus now on the last 250 years, we see that growth was largely restricted to Western Europe and the overseas extensions of Britain for 200 of those 250 years.

Not only has the pace varied over the ages; the change has not been unidirectional. That is not simply a consequence of the decline of individual civilizations; there have been periods of apparent secular stagnation—the most recent being the long hiatus between the end of the Roman Empire in the West and the revival of Western Europe approximately 500 years later.

VI

What can an institutional/cognitive approach contribute to improving our understanding of the economic past? First of all it should make sense out of the very uneven pattern of economic performance described in the previous section. There is nothing automatic about the evolving of conditions that will permit low-cost transacting in the impersonal markets that are essential to productive economies. Game theory characterizes the issue. Individuals will usually find it worthwhile cooperating with others in exchange when the play is repeated, when they possess complete information about the other players' past performance, and when there are small numbers of players. Cooperation is difficult to sustain when the game is not repeated (or there is an endgame), when information about the other players is lacking, and when there are large numbers of players. Creating the institutions that will alter the benefit/cost ratios in favor of cooperation in impersonal exchange is a complex process, because it not only entails the creation of economic institutions, but requires that they be undergirded by appropriate political institutions.

We are just beginning to explore the nature of this historical process. The remarkable development of Western Europe from relative backwardness in the 10th century to world economic hegemony by the 18th century is a story of a gradually evolving belief system in the context of competition among fragmented political/economic units producing economic institutions and political structure that produced modern economic growth.[8] And even within Western Europe there were successes (the Netherlands and England) and failures (Spain and Portugal) reflecting diverse external environmental experiences.[9]

Second, institutional/cognitive analysis should explain path dependence, one of the remarkable regularities of history. Why do economies once on a path of growth or stagnation tend to persist? Pioneering work on this subject is beginning to give us insights into the sources of path dependence (Brian Arthur, 1989; Paul David, 1985). But there is much that we still do not know. The rationality assumption of neoclassical theory would suggest that political entrepreneurs of stagnating economies could simply alter the rules and change the direction of failed economies. It is not that rulers have been

[8]See North and Robert P. Thomas (1973), E. L. Jones (1981), and Nathan Rosenberg and L. E. Birdzell (1986) for accounts of this growth.

[9]See part III of North (1990a) for a brief discussion of the contrasting paths of the Netherlands and England on the one hand and Spain on the other.

unaware of poor performance. Rather, the difficulty of turning economies around is a function of the nature of political markets and, underlying that, the belief systems of the actors. The long decline of Spain, for example, from the glories of the Hapsburg Empire of the 16th century to its sorry state under Francisco Franco in the 20th century was characterized by endless self appraisals and frequently bizarre proposed solutions.[10]

Third, this approach will contribute to our understanding of the complex interplay between institutions, technology, and demography in the overall process of economic change. A complete theory of economic performance would entail such an integrated approach to economic history. We certainly have not put all the pieces together yet. For example, Robert Fogel's path-breaking work on demographic theory[11] and its historical implications for reevaluating past economic performance have yet to be integrated fully with institutional analysis. The same is true for technological change. The important contributions of Nathan Rosenberg (1976) and Joel Mokyr (1990) exploring the impetus for and consequences of technological change have ongoing implications which need to be integrated with institutional analysis. An essay by Wallis and North (1994) is a beginning at integrating technological and institutional analysis. But a major task of economic history is to integrate these separate strands of research.

VII

We cannot account for the rise and decline of the Soviet Union and world communism with the tools of neoclassical analysis, but we should with an institutional/cognitive approach to contemporary problems of development. To do so—and to provide an analytical framework to understand economic change—we must take into account the following implications of this approach:

1. It is the admixture of formal rules, informal norms, and enforcement characteristics that shapes economic performance. While the rules may be changed overnight, the informal norms usually change only gradually. Since it is the norms that provide "legitimacy" to a set of rules, revolutionary change is never as revolutionary as its supporters desire, and performance will be different than anticipated. And economies that adopt the formal rules of another economy will have very different performance characteristics than the first economy because of different informal norms and enforcement. The implication is that transferring the formal political and economic rules of successful Western market economies to third-world and Eastern European economies is not a sufficient condition for good economic performance. Privatization is not a panacea for solving poor economic performance.
2. Polities significantly shape economic performance because they define and enforce the economic rules. Therefore an essential part of development policy is the creation of polities that will create and enforce efficient property rights. However, we know very little about how to create such polities because the new political economy (the new institutional economics applied to politics) has been largely focused on the United States and developed polities. A pressing research need is to model third-world and Eastern European polities. However the foregoing analysis does have some implications: (a) Political institutions will be stable only if undergirded by organizations with a stake in their perpetuation. (b) Both institutions and belief systems must change for successful reform since it is the mental models of the actors that will shape choices. (c) Developing norms of behavior that will support and legitimize new rules is a lengthy process, and in the absence of such reinforcing mechanisms polities will tend to be unstable. (d) While

[10]DeVries (1976 p. 28) has a description of the bizarre remedies proposed by a royal commission to reverse Spain's decline.

[11]See Fogel's (1994) accompanying Nobel lecture.

economic growth can occur in the short run with autocratic regimes, long-run economic growth entails the development of the rule of law. (e) Informal constraints (norms, conventions, and codes of conduct) favorable to growth can sometimes produce economic growth even with unstable or adverse political rules. The key is the degree to which such adverse rules are enforced.

3. It is adaptive rather than allocative efficiency which is the key to long-run growth. Successful political/economic systems have evolved flexible institutional structures that can survive the shocks and changes that are a part of successful evolution. But these systems have been a product of long gestation. We do not know how to create adaptive efficiency in the short run.

We have just set out on the long road to achieving an understanding of economic performance through time. The ongoing research embodying new hypotheses confronting historical evidence will not only create an analytical framework enabling us to understand economic change through time; in the process it will enrich economic theory, enabling it to deal effectively with a wide range of contemporary issues currently beyond its ken. The promise is there. The recognition of that promise by the Nobel Committee should be the essential spur to move us on down that road.

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