

**Understanding the Process of Economic Change<sup>1</sup>**  
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The subject of my essay is Understanding the Process of Economic Change. Including “Understanding” in the title requires a little explanation. What follows is not a theory of economic change. We are a long way from such a theory; and indeed in the neat sense of being comparable with the kind of general theories we have in economics, such a theory is probably impossible. But understanding the process of economic change is an essential prerequisite to improving economic performance. We live in a world of dynamic economic change, but the theory we employ to understand our world is static. Moreover the theory we employ is frictionless. There are no institutions, no government; in short transaction costs are zero. The tools we employ to understand and control the world of dynamic change are simply inadequate to deal with the issues. Nothing illustrates this better than the fumbling efforts we have made over the last ten years to restructure what was the Soviet, and is now the Russian economy. Understanding involves that we rethink the process of change, and not simply tinker with static models. So what follows is a rethinking. It is still a long way from complete, but it is suggestive of where I am going in the new book I am just completing.

Economic change is a result of changes, one, in the quantity and quality of human beings; two, in the stock of human knowledge, particularly as it applies to the human command over nature; and three, in the institutional matrix that defines the incentive structure of society. A complete theory of economic change would therefore integrate these three strands. In this short essay I shall focus on the deliberate efforts of humans to control their environment, and therefore the priority

is on institutional change. But there is no implication that the other two strands are not equally important, as I hope to illustrate.

The central focus of human activity has been, and continues to be, the effort by human beings to gain greater control over their lives by developing a structure to order their relationship to the environment. In effect, the ubiquitous objective has been to reduce the uncertainty that characterizes that environment. Throughout most of history, the central uncertainty has been the physical environment; but as humans have increasingly gained greater control over the physical environment, with the development of science and technology, the uncertainties resulting from human interaction, the human environment, have taken overwhelming priority. In fact, it is our success in conquering the physical environment that has created a human environment of immense complexity, and thereby increased human uncertainty. Let me elaborate a minute on this. What I have called elsewhere the second economic revolution really was the application of science to technology in such a way that it gave humans an enormously increased command over nature. That is not surprising to any of us living in this century. What we do not understand properly yet, however, is that in the process of applying science to technology, we have changed the human environment fundamentally. We live in a world in which interdependence characterizes our very life. The complexities of dealing with the very different environment are central to our getting a handle on the issues that I am concerned with. The structure we impose on our lives to reduce uncertainty accumulates from prescriptions and proscriptions, which produce a complex mix of formal and informal constraints embedded in language, physical artifacts, and beliefs. It is beliefs that connect “reality” to the institutions.

The reality of a political economic system is never known to anyone, but humans do construct elaborate beliefs about the nature of that reality: beliefs that are both a positive model of the way the system works and a normative model of how it should work. The belief system may be broadly held within the society,

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reflecting a consensus of beliefs; or widely disparate beliefs may be held, reflecting fundamental divisions in perceptions about the society. The dominant beliefs, that is, of those political and economic entrepreneurs in a position to make policies, over time result in the accretion of an elaborate structure of institutions, both formal rules and informal norms, that together determine economic and political performance. The resultant institutional matrix imposes severe constraints on the choice of entrepreneurs when they set out to create new or to modify institutions in order to improve their economic or political positions. The path dependence that results typically makes change incremental, although the occasional radical and abrupt institutional change suggests that something akin to punctuated equilibrium change in evolutionary biology can occur in economic change as well. Change is continually occurring, although the rate of change will depend on the degree of competition among organizations and their entrepreneurs. Entrepreneurs enact policies to improve their competitive positions, resulting in alterations of the institutional matrix. What follows are revised perceptions of reality, and therefore new efforts by entrepreneurs to improve their position--in a never ending process of change. Let me illustrate this process with a very brief story of the rise and fall of the Soviet Union.

Marx and Engels provided the belief system that was Lenin's inspiration, explaining the way the world was and the way the world could be. The circumstances of the war-torn Russia of 1917 provided an unusual opportunity for abrupt institutional change. While Marx provided no blueprint for the transformation or construction of a socialist society, he did provide fundamental ideological building blocks, particularly with respect to property, which remained guiding principles and constraints on Soviet leaders. After dire necessity forced retreat from those principles and led to the creation of the NEP, the New Economic Policy, in 1921, the first five year plan in 1928 returned to ideological orthodoxy. In the early years of the Soviet Union, there was substantial discussion of alternative strategies, and hence institutions, to build socialism. The gradual accretion of the complex institutional matrix that resulted led to perceived successes, for example

in heavy industry, and failures, for example in agriculture, and attempts to correct the failures within Marxian orthodoxy. As the economy grew, underwent the devastating torment of the Nazi invasion, and then the lengthy reconstruction process, the institutional matrix was continually being modified by external stimuli such as war, or internal perceptions of needed institutional alterations, guided by a belief system that evolved within the ideological limits of Marxism. The result throughout the 1950s, 1960s, and early 1970s was rapid growth of physical output, particularly in heavy industry, and military technology, and certain areas of scientific knowledge; and the advent of superpower status. Almost half the world become Socialist or Communist in this era, and Socialism or Communism was widely perceived to be the wave of the future. But then growth began to slow. The slowdown was a result of enormous increases in the costs of transacting, increasing problems of agriculture, which became ever more acute; and efforts at institutional reform to rectify the problems which became, and continued to be, ineffective in solving the problem. After the ascension of Gorbachev in 1985, the policies of the next six years led to absolute decline, and in 1991 to the demise of the Soviet Union--perhaps the most striking case of rapid demise without outside intervention in all of human history.

This is a story of perceived reality, inducing a set of beliefs which in turn induced a set of institutions to shape the society, which in turn introduced at the margin incremental policies, which in turn altered reality, which in turn, went back to revising beliefs. The key to the story is the way beliefs are altered by the feedback humans get from changes in perceived reality as a consequence of the policies in action, the adaptive efficiency of the institutional matrix--that is, how responsive it is to alteration--and the limitation of changes in the formal rules as correctives to perceived policy. Now it is one thing to be able to provide a summary description of the process of economic change; it is something else to provide sufficient content to this description, to give us an understanding of this process. What do we mean by reality? How do beliefs get formed? How do they change? What is the relationship between beliefs and institutions? How do

institutions change? How do institutions affect performance? What accounts for the widely varied patterns of performance of economies and policies, both at a moment of time and through time. And perhaps most fundamental of all, what is the essential nature of the process itself?

I have nothing to add to the age-old question of philosophers, what is reality? But I do have a direct pragmatic interest in just what it is that we are trying to model in our theories, beliefs, and ideology. The pragmatic concern is with the degree to which our beliefs coincide with that reality. To the extent that they do coincide there is some prospect that the policies that we enact will produce the intended result, although throughout human history, we have gotten it wrong much more often we have gotten it right. It is important that we be very self-conscious about the nature of that reality. And even more important is the awareness of just how reality is changing.

Beliefs and the way they evolve are at the heart of this essay. For the most part economists, with a few very important exceptions like Hayek, have ignored the role of ideas in making choices. The rationality assumption that has served economists and all the social scientists well for a limited range of issues in microeconomic theory is a devastating shortcoming in dealing with most of the major issues confronting social scientists and policy makers, and it is a major stumbling block to the path of future economic progress. The way we perceive the world and construct explanations about the world requires that we delve into how the mind and brain work, the subject of cognitive science. The field of cognitive science is still in its infancy, but already enough progress has been made to suggest important implications for social science theorizing. The questions we must be able to answer are how human beings respond to uncertainty--and particularly the uncertainty arising from the changing human landscape. One of the dilemmas that we economists have long agreed on, and that eminent theorists like Kenneth Arrow and Robert Lucas have emphasized, is that you cannot theorize in the face of real uncertainty. You cannot theorize in the face of uncertainty because in a world in which you do not know what is going to happen

you do not have any way to be able to statistically derive a probability distribution of outcome. But in fact, human beings theorize about the world of uncertainty all the time. We make decisions in the face of pure uncertainty, based on religion, beliefs, or ideologies. Now, what we need to know is how human beings actually go about making choices in the face of pure uncertainty. The subject is central to the way in which human beings throughout history have been forced to make choices when they really do not have an understanding of where they are going.

A lack of understanding has never stopped human beings from evolving complex beliefs or ideology; I just described Marxism to you, which is one of the most elaborate belief systems that has ever evolved, and one that dominated the beliefs and the choice-making of half the world for a good part of the twentieth century. But Marxists are not alone; we all have belief systems, and to the degree that we are policy makers and we are in the midst of enacting policies, we are making policy every day with beliefs, ideologies, whatever we want to call them, which are, to put it mildly, incomplete, imperfect, and uncertain with respect to their outcomes. Most of what we are doing these days in cognitive science is evolving away from a view that the mind works like a computer, which was indeed the early view of how the mind worked. Today, more and more we have come to the conclusion that the way in which the mind works is based on pattern-based reasoning. The neural networks of the mind gradually establish patterns by which they interpret the world, and the patterns become quite complex and elegant, as indeed many belief systems and ideologies are. The patterns are important because to the degree that we face novel situations, to the degree that we face new problems that we have not faced before, then the question is, how do we make sense out of them?

If the novel situation is similar enough to patterns that we have in our mind, that we have derived from past experience, then indeed we may solve the problems more or less accurately and enact policies and rules that improve our lives. To the degree that the situations are really novel, they pose fundamental dilemmas with respect to how we deal with them. Now, humans attempt to use

their perceptions about the world to structure the human environment in order to reduce uncertainties in human interaction. The resultant institutional structure is a combination of formal rules, informal constraints, and their enforcement characteristics. By formal rules I mean constitutions, laws; by informal constraints I mean norms of behavior, conventions, codes of conduct. Obviously the degree to which both the formal rules and informal constraints are enforced determines how effective those rules and constraints are in shaping our actions. The institutional constraints accumulate through time, and the culture of a society is a cumulative structure of rules, norms, and beliefs, that we inherit from the past, that shape our present, and that influence our future. Institutions change, usually incrementally, as political and economic entrepreneurs perceive new opportunities, or react to new threats, affecting their well-being. Institutional change can result from change in the formal rules, the informal norms, or the enforcement of either of these.

But whose perceptions matter? Obviously not everyone's; we need to delve into the structure of rule making in the society to answer that question. Much of the work in political economy concerns modeling the way in which we make and aggregate choices that shape incremental change in institutions. The political/economic structure of the society and the way it evolves is the key to whose choices matter, and how they get aggregated to shape policy.

Now let us see if we can begin to put the pieces together, to explore very incompletely, the process of change. We can conceive of the process as a circular flow, in which we have initial perceptions of what reality constitutes. Those perceptions in turn lead to the construction of a set of beliefs, ideologies to explain that reality and to explain the way that we should behave. That in turn leads to the creation of an institutional structure, or an institutional matrix, which then shapes our "world". And as our beliefs about that reality incrementally change, we enact policies that incrementally modify that institutional structure. An incremental change is always constrained by path dependence. That is, the existing institutions constrain our choices. As we make those choices which are

incrementally altering policy, we are changing reality. And in changing reality, we are changing in turn the belief system we have. That circular flow has gone on ever since human beings began to try to shape their destiny.

I want to stop here to point out how my view deviates from the view of most economists with respect to this problem. The difference between the story I am telling you and the one that I see most economists telling, is that most economists believe that you can derive models based on the past, and indeed, on what we call Bayesian updating of the model; and with those therefore you can make the right policy in the present and the future. Now that works if the future is like the past. If the future is the same as the past, one could indeed make a stronger statement and say what would happen over time. Even though we made mistakes and enacted the wrong policies, the feedback would get us to correct those policies, modify them; and eventually we would arrive at a world in which our belief system and reality would coincide. But that is if the world stays the same. And that is indeed the implicit model that economists typically have. The world, however, is not staying the same; we keep on changing reality by the policies we enact, and we have been doing so for the ten thousand years about which I have been writing. This is important, because if indeed the future is different, and different in novel ways from the past, then whether we get it right or get it wrong is going to become a crucial issue. But the important thing is to recognize that if the world is changing, and if we are creating novel situations that cannot easily be dealt with, and we cannot use the same tools that we have used in the past, or cannot use them uncritically, then in fact we are going to get it wrong in the present and the future.

Some questions we should answer, but for which we still have very incomplete answers, are the following: Is the process similar to models derived from evolutionary biology? What difference does the intentionality of the players make? And what is the nature of the human intentionality that is the immediate source of institutional change? Does the uncertainty of the human race come from the inherent instability of the human landscape or the perceptions and beliefs that

we have about the human landscape? Economists at the Santa Fe Institute, which I have visited a number of times, spend a lot of time modeling what we call complexity. Complexity, a lot of it, deals with attempting to develop chaotic models of the world. Do they characterize the world that we are trying to confront? Or indeed, is the world more orderly? Are there beliefs that make it so that we get it wrong? Or is it the reality that we misunderstand? What is the source or sources of discontinuous, abrupt evolutionary change? What is the underlying source of path dependence, how does this path dependence affect performance? Path dependence is something again that we do not know very much about. We know that it is very real; anybody who is a historian knows that we very seldom change direction abruptly. The institutions and beliefs of the past have an enormous effect on constraining the ability to make change in the present and the future. But exactly how those constraints work, when they loosen up so we are able to make more radical change, when they do not is something that we should know a lot more about. And finally, what makes for adaptive efficiency?

By adaptive efficiency I mean the ability of some societies to adjust flexibly in the face of shock and evolve institutions that effectively deal with altered reality. I spend time now advising transition and third world economies. I observe that when people get excited about a country that has grown for ten years, they say, it's on the path to growth, or, we've finally overcome Latin American instability, or, we finally got transition economies on the way. For an economic historian, that is just ridiculous. I think in terms of fifty or a hundred years, and then I can think about whether you have really evolved a society that has the ability to withstand shock, to overcome continual problems. That is a very different thing from growing for ten to twenty years. Western Europe and the United States are adept at what I would call adaptive efficiency. They are economies and societies that have withstood all kinds of shocks, wars, and radical fundamental change, and that have managed throughout to adapt their institutional structure to make it so they have had continuous growth over long periods of time. That is what we really want to have in societies that today are Third World or are like the Latin American

economies that have been characterized by stop and go growth for the last three hundred years, but not steady growth. Steady growth is a very different thing, something that we do not know how to create in the short run. We do know, that in England and in Europe, and in the United States, we have evolved an institutional structure in which the informal norms of behavior, more important than the formal rules, have built into the body politic this adaptability. This structure tends to provide a set of guiding principles that constrain the way in which we evolve and have made for this adaptive efficiency. The fundamental obstacle to creating such policies is informal norms geared to personalized exchange that inhibit the growth of impersonal exchange, a subject I shall deal with below.

How successful are we at controlling our destiny? In the tradition of Herbert Simon, who directed our attention to these issues, we can ask what difference does it make that the agents fall far short of substantively rational behavior which would entail full knowledge of all possibilities and contingencies, the exhaustive exploration of the decision tree, and a correct mapping between actions, events, and outcomes. The short answer is that it makes a lot of difference. Economic history is an endless depressing tale of miscalculation, leading to famine, starvation, deceit and warfare, death, economic stagnation and decline, and indeed, the disappearance of whole civilizations. Even the most casual inspections in today's news suggest that this is not purely a historical phenomenon. Yes, we do get it right sometimes, as witness the spectacular growth of the western world for the past four or five centuries. But we also get it wrong more often than we get it right.

Let me go over three ways we get it wrong--ways that we have gotten it wrong in the past, get in wrong in the present, and will get it wrong in the future. The first is the straightforward one which should be clear by now: we never really understand reality. The theories, beliefs, models that we have are very imperfect; they are vast oversimplifications of a complex world, and they are usually static oversimplifications. It is not bad that they are oversimplifications, as long as we grasp, and have built into our theories, the essential characteristics that are the

guiding principles that are making it work. And making it work over time is something that is much more difficult to do than to have an accurate snapshot of a moment in time. So, the degree to which we understand this reality is obviously the first place where we never get it completely right, and sometimes we have it completely wrong.

The second concerns belief systems. Obviously to the degree that our beliefs are attempting to make sense of a world in which we have pure uncertainty, they are unlikely to be very good or very accurate. Whether the beliefs are derived from religions, as they have been throughout most of human history; whether they're derived from elegant models, and Marxism is certainly one of the most elegant, complex, and impressive systems of theory that has ever been constructed; or whether they are ad hoc bits and pieces of beliefs that characterize the way in which most of us, including most politicians, make everyday choices, they mean that we are going to get it wrong much of the time, particularly, as I intend to illustrate in a minute, as the world is changing on us.

The third way we get it wrong is one that is particularly sensitive to the world we are in today, and to the problems that economists are facing who attempt to deal with improving the lot of transition and third world economies. And that is, that we use tools to control our world that are very blunt instruments. The only tools that we have that allow us to try to shape the world we are in, are the formal rules of the game. But, the structure that guides the way in which we operate is made up of formal rules, informal norms of behavior, and their enforcement characteristics. All we can change quickly are the formal rules. We cannot change the informal constraints, at least not in the short run; and even our ability to control enforcement is very limited. In 1990 I was one of four Americans invited by the Soviet Academy of Scientists to go to Moscow to advise the Soviet Union on its economy. The first American said, all you have to do is privatize and all will be well. The second American said, all you have to do is eliminate government, and all will be well. The third American said, all you have to do is have the computer and all will be well. I was the fourth American and I said, don't pay

attention to the first three speakers; the problems are much more complicated. Let me illustrate by discussing the first panacea--privatization.

Privatization tends to be a catch-all panacea for a country's ills. But needless to say, anybody who watches the Soviet Union--or now Russia--has observed, privatization without the fundamental structure of the rule of law and enforcement mechanisms to go with it does not produce desirable results. There is privatization in Latin America, but privatization in the context of government fostered monopolies produces a world that does not look at all like what you want. It is a very real problem that when you are trying to improve the performance of an economy, all you can change are the formal rules. In fact you must also change the informal constraints, and you must get enforcement characteristics that will produce the desired results. In the early nineteenth century, Latin American countries got independence, and when they did, most of them copied the U.S. Constitution and many of the formal property rights rules that were enacted as a part of that constitution. The results were widely variant with the way in which those rules worked in the United States. This is not surprising; the rules in the United States had evolved out of the set of rules that had been part of the assemblies of the various colonies, and they were rules provided by Britain both for self-government and for assembly, and also for a set of fundamentally effective property rights. They were taken over and embodied in the U.S. Constitution, and they were consistent with norms of behavior and enforcement characteristics that we had evolved over the previous years. The result was not surprising: they worked quite well. But when adopted by Latin American countries, they were wildly at variance with situations there. Latin America had been run from Madrid (or from Lisbon), and it had viceroys that enforced the rules, the objective of which had been to gather treasure for Madrid; there was no self-government; and property rights, enforced only from Madrid, gave monopolies to merchants. It is not surprising that when independence came and a set of policies that came out of the heritage of American experience that had gradually evolved were imposed, they produced radically different results.

I am using Latin America for illustration, but I could equally talk about Russia, or indeed, other economies in Eastern Europe. What we are trying to deal with is how we can adjust and make changes in policies so that they produce more effective performance characteristics on the part of societies and economies. It is quite clear that our ability to make radical change depends on the way in which beliefs have evolved in society, and the degree to which that set of beliefs is amenable to the kind of changes that we think are essential. Let me give you two illustrations: one, a general one, and then one specifically dealing with perhaps the most interesting economy in the world today, which is China.

The general one is quite straightforward. The most dramatic and traumatic shift that has occurred to human beings throughout history has been the shift from personal to impersonal exchange. By personal exchange, I refer to a world in which we deal with each other over and over again in small scale economic political and social activity, where everybody knows everybody, and where under those conditions, to use a simple illustration from game theory, it pays to cooperate. That is, game theory says that human beings cooperate with each other when they play a game over and over again, when there is no end game, when they know the other parties to the exchange, and when there are small numbers. In such a world transaction costs are low, but production costs are high, because it is a world of small scale production, without economies of scale, and in which you typically cannot use the modern technologies I have described as part of the second economic revolution. This revolution began in Germany in the chemical industry in the last half of the nineteenth century and is now spreading all over the developed world. The world it has produced is characterized by impersonal exchange. It is a world in which our dependence rests upon people all over the world, whom we do not know; there are no repeat dealings; and large numbers of players are involved. Therefore it is a world in which the game is played differently. In game theory, we say such a world is a world in which it pays to defect. That is, if you do not know the other party, you are never going to see him or her again, and neither side has any particular further hold on the other, it

pays to run off with the money. A lot of economic historians have spent much time considering the way in which the western world, in the last six, seven centuries, evolved a set of institutions that made cooperation in impersonal exchange worthwhile. That is, these institutions changed the payoff so that impersonal exchange paid off and the economies of scale associated with large scale production made possible the world of relative abundance we now observe.

That was an immense achievement. However, the movement from to personal to impersonal exchange means you have to create not only economic institutions that will create low cost exchange, but political institutions that will undergird such exchange. And indeed that is the dilemma. We know how to create economic institutions that will make for impersonal exchange, and indeed we have created a lot of them; but we do not know how to create political institutions that will do so. You have to have political institutions because when the size of the market moves beyond the realm where reputation can be an effective vehicle in constraining human behavior, then you must have third-party enforcement and that means government and the state. We do not know how to create such political systems--even though there is a lot of exciting work going on in political economy that is focusing on the issue. Russia will never have sustained success until it has a polity that will produce those results. Nor will anywhere else, for that matter. So, the movement from personal to impersonal exchange is a fundamental stumbling block.

I said I would mention China. China is intriguing because it does not appear directly to do any of the right things. It certainly does not have the rule of law, it has a political dictatorship; it does not have secure property rights--all of which have undergirded the development of the United States and the western world. But, note what China has done. The central government has deeded, not necessarily deliberately but nevertheless deeded, autonomy to the local governments. The autonomy has been fed with capital coming in from overseas Chinese. The local TVE's--town-village-enterprises--are neither firms nor cooperatives, they are a weird mixture of both, but they are a mixture of both

which have substantial autonomy, and for which local communist party bosses provide secure property rights. The result has been an economy which has, not in a formal but in an informal sense, evolved a set of institutions, rules of the game, that has created the highest rate of growth of any economy in the world (though I think that China faces gigantic problems down the road). So there are lots of different ways to achieve economic growth. There are lots of different ways to structure the game, to provide the correct incentives (that is what institutions are, incentive structures) to do the right thing. But the key is to provide an incentive structure that rewards productivity growth.

Now let me conclude by making some very broad general implications. The first is quite straightforward, and I trust should not surprise you even if you may not agree with it: there is no way to make intelligent predictions of long range change. And that is because we cannot know today what we will learn tomorrow and believe tomorrow. I do not believe that anybody other than soothsayers can tell what is going to happen to societies and economies down the road. We may know tomorrow, the next day, a few years ahead; but what we are going to learn and believe in the in the more distant future--is something we cannot know today.

Second, there is no such thing as laissez-faire. I am a big fan of Milton Friedman's, but laissez-faire got us off on the wrong foot completely. Any market that is going to work well is structured, it is structured by deliberate efforts to make the players compete by price and quality rather than compete by killing each other or other means. Now I want to emphasize this because throughout history and indeed in the present world there has been much talk about laissez-faire or getting government out of it. You do not get government out of it. What you try to get government, either directly by rules and regulations and property rights, or indirectly, to do, is to structure the game so you force the players to compete by price and quality rather than compete in other ways. It means you must structure factor and product and markets differently; it means you must structure a labor market, a capital market. I feel very self conscious about this because for the last half dozen years I have been an advisor to the World Bank on a set of policies in

which we have attempted to look at how to structure various kinds of markets to work well. We looked at telecommunications; most recently, we have looked at water. And it has been an education. With telecommunications, just to take a simple illustration, obviously the structure at one moment of time, which might work well, is not going to be the same as at another moment of time, because technological change has changed the industry from being a natural monopoly to being a competitive industry. And therefore, radically different policies may be involved, with respect to the way in which you want the game structured to get the results that you want.

Now this has a lot of implications, I suggest, for the world that we are living in today, because I think that the kind of structuring of financial and capital markets that worked well in the past simply does not necessarily work well today. For example, I am looking at what happened to Japan: over the last forty years financial and capital markets worked well but the ministry of finance and the bureaucracy in Japan evolved to produce a capital market and financial structure that does not work well today. The fact of the matter is that you cannot assume that markets are going to continue to work perfectly. So we not only need to structure each market differently, but perhaps most important we must recognize that changes in technology, information costs, and government structure will alter the performance characteristics of markets over time. The scandals in the United States involving Enron and others at the end of the 1990's reflected changing structures that made anti-social objectives far more profitable than the productive objectives that Adam Smith assumed with well- functioning markets.

The foregoing is all too brief a summary of the process of economic change. I do hope it will inspire scholarly efforts to carry forward a research agenda that I believe to be essential to improving the performance of economies through time.