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THE ECONOMICS OF BOUNDED RATIONALITY, ENTREPRENEURSHIP AND INSTITUTIONAL EVOLUTION

by

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ABSTRACT

Bounded rationality provides a fundamental economic explanation for nonrational modes of behavior. These nonrational modes underlie both the erratic perturbations of entrepreneurship and the systematic waves of diffusion they initiate which in turn guarantee that the economy operates out of equilibrium. Continuing adjustments out of equilibrium are made possible by financial intermediation. They imply assymetric changes in individual welfare. The markets for entrepreneurship, ownership and control that liberate creativity and boundedly rational decision–making, therefore, also lead inevitably to conflict among various social groups. Democratic mechanisms for correlating public and private interest that enlist the voluntary participation of agents who are sometimes made worse off in the continuing process of social transformation and which restore access to markets for those who lose is therefore an essential part of a modern economic system.

The dialectical interaction among market allocations, non–market buffering and stabilizing institutions and democratic process is thus fundamental. Reforms that are based on this interaction achieve voluntary self–transformations. Those that do not, ultimately fall victim to involuntary forces.

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A flourishing industry of transactions cost analysis has developed in recent years that has given the study of institutions a solid foundation within the mainstream of economic thinking. That the transaction should be admitted as a fundamental unit of analysis and that its cost should be given a primary role in explaining economic organization is a major development in economic thought.[1] In spite of the classic studies of the behavioral school, the still more fundamental cost of individual economizing behavior itself (apart from exchange), has not received comparable attention. For that reason the full implications of boundedly rational behavior for understanding economic organization and development are not widely understood or fully appreciated. These implications are profound and a gradually growing volume of work is beginning to make headway in clarifying the central issues.[2]

In particular it seems to me that a careful analysis of boundedly rational economizing yields important insights into the role of institutions for mediating market forces; it exposes the fundamental causes of continuing economic evolution; it helps explain why capitalism changes so rapidly; it shows why socialist systems that do not make adequate use of private property fail to progress rapidly in the quality of human life; and finally, it helps illuminate a fundamental need for non-market institutions that buffer change and mitigate the social cost of rapid economic development.

In this paper I want to sketch the argument behind these assertions. Obviously, a full exegesis of the issues must await a much expanded treatment. The need, however, for this perspective on market institutions is sufficiently great to justify its presentation in a preliminary and incomplete form.

1. ECONOMIZING ECONOMIZING

The recognition of rules of thumb and other types of boundedly rational behavior has often been resisted on grounds that it is *ad hoc*. It is evident, however, that such behavior rests solidly on the economizing principle as soon as it is admitted that economizing behavior is in and of itself costly: it takes time and when aided by various forms of physical calculation requires resources such as the efforts of technical experts, computers and so forth. This means that the methods, efforts and resources devoted to allocating scarce resources are part of the economizing problem in any decision–making situation, and that *at best* any solution to the problem at hand will be proximate and suboptimal in principle.

Boundedly rational decision–making is not the only mode of behavior available for economizing on the cost of economizing. Nonrational modes are also available. These include at least the following:

(1) experimentation

(2) obedience to authority

(3) imitation

(4) unmotivated search

(5) habit

In experimentation a number of trial choices are made and the outcomes compared, a direction of improved decision– making might be discerned which may in turn guide further search. At each stage in the trial and error process the cost of decision– making is very low, but over time and given a sufficiently stable environment improving decisions

can emerge.

Doing what one is advised or ordered to do by an authority is a common mode of behavior and most people invoke it frequently. Even more routine is the imitation of others. Thoughtless impulse driven by some sort of subconscious motivation no doubt plays a prominent role in many people's decision–making. At the same extreme minimum of intellectual cost is the exercise of habit, the unconscious repetition of past behavior.

If these modes of behavior were aberrations in the life of economic man, they could continue to be ignored for purposes of economic analysis. But they are not. They not only exist but are an extremely important part of all human endeavor including economic behavior. And it is well that this is so for they make possible a focus of scarce cognitive resources and an effectual deployment of rational thought.

It follows that in any given individual situation there must be some kind of mental monitor that selects a problem approximation — problem solving algorithm pair or a nonrational mode of choice. When, how often and under what conditions conscious ratiocination kicks in and displaces less costly modes of behaving is something we have not really considered in our discipline. Nonetheless, some implications fall out readily from classical economic thinking. Let us consider some obvious ones.

2. MANAGEMENT AND ENTERPRISE

Because economizing is costly, it is natural that specialization and cooperation should yield benefits just as they do in physical production. This is the ultimate reason for the existence of a managerial function. The performance of specialized physical and mental tasks and their coordination through management is the basis of enterprise. While some individuals in an enterprise focus on the development and application of requisite physical skills, others must focus on communication and coordination. This specialization rests on cooperation. Cooperation, however, is costly and can in general be achieved only through

the expenditure of effort.

Voluntary cooperation can be induced through incentives; involuntary cooperation through some form of coercion. The former is generally the more productive in practice, but in either case the cooperating individuals must forego the freedom of arbitrary action. They must submit to the broader purpose of the enterprise.

As an enterprise grows the same principle of the division of labor that operates in physical production applies with equal force to management, and so managerial systems emerge. As such systems grow in complexity, the costs of communication and coordination grow and all the other costs of transaction occur. In this way organization is subject to both increasing and decreasing returns.

In some areas of enterprise the cost of decision–making is so great that managerial systems fail to emerge or do so only after many collateral developments have occurred. It seems to me that the reason agriculture has been so slow in admitting the factory system, and then only in certain highly specialized areas, is because the control of nature poses vastly more intricate problems of management than all but the most complex systems of human design. A primitive farm in the most backward country probably requires a greater degree of understanding and an intelligent control over a wider spectrum of varied tasks than work on a typical assembly line.

In any case it must be recognized that the exercise of economizing activity is itself a costly function and subject to the same economies and diseconomies associated with the division of labor in the production sphere.

3. IMAGINATION, INNOVATION AND IMITATION

Managerial systems did not always exist. They originated and evolved in the same way as other aspects of economic creation through a process of invention, innovation and diffusion. That process begins in the individual imagination.

The ability to form and communicate images is at the foundation of human thought and language. Its creative character is a primitive quality even of everyday speech which it has been recognized is the common heritage of all but those with special handicaps or impediments. Rational thought in general and economic rationality in particular rests in that same creative capacity, for most of the choice problems that occur involve a selection among imagined futures, "possible scenarios of what might happen, sequences of imagined act and consequence that form conscious stories of what might be. To choose rationally is to compare imagined stories, to select one and then to design a sequence of actions that will make those stories come true."[2]

Imitation too (and obedience to authority) requires the exercise of imagination, for it requires one to imagine doing oneself what another one may have done or is doing, or what one has been told to do. But it requires a less demanding application of it.

At the other extreme the invention and innovation of something entirely new requires a more intensive application of imagination, and like all other human faculties the capacity for such creative endeavor is scattered asymmetrically through any population. Some are more richly endowed than others. That some individuals should invent, others innovate and still others imitate is a simple and obvious application of the economizing principle when the individuals who specialize in one or the other are able to share in the benefits of a common enterprise.

The entrepreneur draws on a more exalted form of an ability that every human shares to some least extent. Inventors and entrepreneurs imagine things that do not exist and foresee practical steps that can make them happen just as each of us does whenever we form a plan for the future and carry it out. The adoption of new techniques of production or management by "ordinary" decision–makers swell into the creative waves of destruction that transform societies. Such transformations simply reflect the reasonable application of boundedly rational thought by the great body of managers and workers whose own

endowments of creative imagination is sufficient to enable them to imitate the successful ideas and behavior of others. Bounded rationality thus explains the existence of specialized roles for management, entrepreneurship and imitation in searching out an economical allocations of resources.

4. ENTREPRENEURSHIP, OWNERSHIP AND CONTROL

Likewise, it is in the interests of economy that the use of rules intrudes in systems of management. The latter, as they grow in complexity, become more and more directed by standard operating procedures instead of by rational thought and willful action. Like habit and conservative rules of individual behavior, these SOP's economize intelligent discretion. Collaterally they add inflexibility and reduce responsiveness. They constrain individual initiative in the exercise of creativity and rational choice. Thus, the scarcity of imagination and intelligence that bounds the rationality of individual action, likewise bounds the exercise of creativity and rational choice within organizations. The resulting inertia stabilizes enterprise but it impedes invention and innovation.

In this way it is seen that the yin and yang of economic history, the bursts of creative morphogenesis and the growth of culture contrasted with the atrophy of initiative and enterprise that characterize the decline of societies, arise from the fundamental nature of thought, both its possibilities and its limitations.

In the early phase of capitalism new institutions emerged in the economic and political spheres, new institutions that liberated creative activity from the conservative bonds of an overdeveloped feudal managerial infrastructure. The progressive expansion of ownership from the mere possession of things to a limited monopoly over specific opportunities enabled entrepreneurial effort to be extended throughout the possible domains of production. The result was a radical increase in invention, innovation and adaptation, a radical destabilization in the forms and substance of daily life.

The large scale economic organizations that emerge from the successful development of capitalism, however, surpassed the realm within which entrepreneurial management could cope. Bureaucratic management with its SOP's gradually evolved to economize scarce creative and scarce decision-making talent. The limited monopoly of economic opportunities that private property bestows upon individuals rapidly grew into a highly concentrated control over the rewards of enterprise and the effective coercion of those who specialized in "work" or "labor" by those who owned and managed.

This capacity for a successful development to produce the seeds of its own destruction was expressed in the socialist theory of dialectical materialism. That theory, however, failed to incorporate a fundamental aspect of the emerging system; namely, that the legal and political mechanisms invented to liberate the individual by conferring on him limited monopoly of specific opportunities (such as the right to sell one's land, or to bargain for a wage) contained within them a countervailing potential for an evolving institutional framework; a framework that could modify itself in the midst of the process so as to reduce the social costs of rapid change and restore opportunity to the disenfranchised.

It is this potential for expanding the scope for individual discretion while stabilizing the inherent conflicts and social costs of rapid change that characterizes the coextensive development of democratic polity and capitalistic economy.

5. THE ROLE OF FINANCE

The creative potential bubbles up in a mysterious way that seems quite independent, at least in part, of wealth and power. It can be realized only when means are placed at the discretion of those who possess it in abundance. The emergence of a specialized role for mediating the transfer of purchasing power in exchange for promises of future repayment, and the creation of credit instruments that empowered specialized enterprises to create purchasing power where none existed before therefore constituted economic invention of

a very high order. The institutions of banking and of financial intermediation generally provided mechanisms for facilitating entrepreneurship on a very wide scale. In this way they have been essential instruments in the transformation of economy. By allocating purchasing power they ration the application of imagination and initiative, simultaneously enabling yet stabilizing change.

Here, too, as everywhere in economic life, the principle of bounded rationality is at work. Optimal allocations of capital can be approximated at best, and because entrepreneurship itself involves the hazard of discovery, the investment of capital can be and often is mistaken. Indeed, financial intermediation is governed by the same bursts of inspired rationality, the same waves of imitation and diffusion, the same constrictions of habit and inertia as in all managerial systems. In any case it interacts with the "real" sector in a fundamental way. Far from being "neutral" the financial structure is literally the heart of the system.

6. THE MODERN ECONOMY

So, in procedures of property, polity, money and credit the modern economy provides an evolving framework of institutions that mediates production and exchange, work and management. Because of bounded rationality the system unfolds out of equilibrium. If an equilibrium were suddenly attained it could be perpetuated only if allocation were governed solely by habit and inertial rules. The pursuit of individual advantage and social improvement, however, always has room when the creative impulse is allowed to play for, given a supply of purchasing power, it generates new alternatives that give scope for rational choice, new objectives for imitation and new avenues for the average individual to change.

At the same time it destroys traditional opportunity; it shifts advantage from one pursuit to another; and it exposes individuals to aggregate market forces that expand the

fortunes of some while reducing the fortunes of others. Thus, conflict arises naturally and unavoidably as development unfolds. This conflict reaches intolerable levels when the gap between those who flourish and those who stagnate widens enough. Democratic mechanisms, however, provide an avenue for pressures to restore, through the innovation of new rules and new institutions, access to the market system. When well conceived these rules and institutions can dissipate the social costs of change by continually generating opportunity. If one set of institutions fail in this regard, another set can be tried, and so the system as a whole moves from one form to another.

In the modern economy private property confers both opportunity and control on individuals and voluntary groups. The successful exploitation of opportunity confers advantage, the unsuccessful confers disadvantage. The assymetric outcome of boundedly rational economizing produces social conflict. This conflict is mediated through democratic institutions that modify the system in response to pressure, which restore opportunity and which buffer the costs of change. This is a dialectical process but not one of dialectical materialism. It is the dialectical interaction of economic and political forces.

The inherent instability of capitalism was a key insight of Marx but his analysis of it was seriously flawed. He failed to recognize that those who rule perform a productive function when rationality is bounded. He failed to see that capitalism was not only an instrument of exploitation, but one of liberation. He failed to recognize that the concepts of democratic government evolved through the enlightenment, contained within them the means for institutionalizing change and for progressively correlating – not perfectly and not always harmoniously – - but nonetheless correlating the pursuit of private interest and public purpose.

The failure of socialism is a failure of the imagination. Whenever the revolutionary cadres of communism have paved the way for a rationalization of planning on a national scale, the bureaucratization of allocation has followed. Cooperation has been attained

through massive coercion. The social costs of economic allocation were moderated, not by evolving institutional means but by supressing change.

Older socialists sometimes wistfully exclaim that one could never have guessed a century — even half a century ago what capitalism in the so called free world would achieve in the coming decades. Some have even been heard to voice their regret that during the intervening years what socialism is and should become remains a mystery: what was to have been discovered during the process of transformation has yet to be revealed.

The principals of bounded rationality explains why all this must be so. A new way does not come into being in some finite time after progressing through some finite number of preliminary stages. It does not emerge complete no matter how prodigious the effort or how earnest the intent. It is discovered little by little in individual acts of creative genius scattered throughout the ranks of ordinary people and seems to be fostered best when even those of the most modest talent are allowed considerable discretion as to when to obey authority, when to imitate a peer or when to think for themselves.

This principle works in government as well as in economy. Access to opportunities in both the economic and political spheres provides a continuing restoration of intellectual resources for the vulgar demands of production and of collective decision– making. The institutions of the modern economy provide for continual monitoring of assymetric trends of welfare and influence. They continually work to mediate conflict as it necessarily appears.

In this way, *the limited potentials of the many are liberated; the common good is not held hostage by the bounded rationality of the few.*

7. EQUILIBRIUM AND DISEQUILIBRIUM

General equilibrium theory provides a formal articulation of Adam Smith's fundamental insight that a price system can coordinate economic activity individually pursued. It also provides a universally verifiable prediction: that when the conditions of equilibrium

do not exist, then powerful forces for change exist, and change can be resisted only through some combination of tradition, rule bound behavior and coercion. It has been a mistake made by the "new classical" economists, however, to assume that when imagination and boundedly rational thought are given full scope for individual operations in the political and economic spheres the change that occurs occurs in equilibrium or converges to an equilibrium. It does not.[4]

To have institutionalized the process of unending economic and political transformation out of equilibrium was the truly incredible achievement of the inventors of the modern economic system. That system is not a state in being. It is a process in evolution, an unfolding discovery, a becoming of what will be, though it never comes to pass. It performs its explosions of productivity in spite of peroxisms of inflation and unemployment. It overcomes its social costs not by gradually discovering Pareto equilibria, but by exercising specific mechanisms that eventually restore opportunity and ultimately engage the voluntary participation [5] of those unavoidably made worse off through their exposure to market forces.

8. THE DIALECTICAL REPUBLIC

"Eventually restore" and "ultimately engage" are key phrases. In the process of change, opportunity is destroyed and acceptance of change may be unwilling. Conflict may be intense; violence may emerge. To contain its level below the suicidal destructiveness of national revolution is a fundamental problem of polity. The mechanisms of voluntary participation play this role because they lead to voluntary self-transformation.

"Democratic capitalism" is a poor phrase for capturing the process of political-economic transformation unleashed by boundedly rational economizing behavior. A capitalistic enterprise need not be and seldom is democratic in the political sense. Democracies need not — and can not — rely solely on capitalistic forms of enterprise. The latter,

working in disequilibrium, create too much instability and the social costs of change are generally very high. Various social agencies created by government do augment and must augment the functioning of industry and commerce. Their fundamental functions are to *bound and buffer change* while facilitating its occurrence.

The correct blend of market and social mechanisms is a problem. It is not solved by a single act of rational thought; it cannot be brought about either by a convergent tatonnement or by a political revolution. It can only be sought by a flexible system of polity and economy that allows for the widespread application of individual discretion and by trial and error experiments with various formats for collective action.

To convey the idea of this kind of system, one that is *intendedly evolutionary* in principle as well as in fact, I prefer — instead of the terms democratic capitalism or democratic socialism — to call it the Dialectical Republic. It was invented in the Age of Enlightenment, innovated in America during its national formation and adopted in one form or another in many parts of the world. The modern combination of democratic government and decentralized economic decision–making based on private property is even making inroads where its institutions have been purged and where they have been most ardently resisted. Its success in the future will depend not only on the failure of its competitors but on a knowledge of its history and of its fundamental nature.

In my opinion those socialist reforms that introduce markets without the stabilizing and buffering mechanisms of the post Keynesian era will repeat the depressions and financial panics of the 19th and early 20th centuries. If they fail to introduce the democratic institutions that foster voluntary participation, they will continue to expose themselves to the abuses of bureaucratic coercion. In my opinion, also, those ardent reformers of capitalism who wish to minimize or remove the stabilizing and buffering role of government will pave the way for a re– emergence of the gross instabilities of the past.

NOTES

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1. I have in mind primarily the work of Williamson and the huge literature his work has inspired and Douglass North who has developed the theory in sweeping historical terms.

2. Included are those of Conlisk (1980, 1986), Heiner (1983), Nelson and Winter (1982), and Day (1987).

3. For an elaboration of this point see Day and Pingle (in preparation).

4. By estimating and comparing equilibria that might exist under different policy regimes useful *directions* of change may be predicted. Because they are relatively simple, therefore practical, the tools of comparative static analysis based on equilibrium theory are and must continue to be the basic working tools of applied economic analysis, but only because they can be used on a first approximation for predicting change, not as a means for predicting what will eventually prevail.

5. John R. Commons, used the terms "willing participation."

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