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Abstract -There is growing agreement among economists, as well as social scientists more
generally, on the importance of describing human actors in more veridical terms than those employed by economic orthodoxy. Such efforts invite a variety of responses, to include reformulating the utility function and supplanting maximizing by satisficing. This paper holds that organization—in the form of both specialization and governance—is the chief means by which to relieve "problems" which have their origins in the attributes of human actors. Specifically, the cognitive limits and contractual hazards to which human actors are subject are relieved by specialization and governance, respectively. Both at the level of individual choice and the theory of the firm, a huge amount of variety is rendered more understandable and a large number of refutable implications obtain by interpreting organization as a "solution" in these ways.

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Human Actors and Economic Organization

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If "Nothing is more fundamental in setting our research agenda and informing our research methods than our view of the nature of the human beings whose behavior we are studying" (Simon, 1985, p. 303), and if there is growing evidence from experimental psychology that "human subjects often behave in a way that is not predicted by the assumption that they are proper decision theorists with well-behaved utility functions" (March and Shapira, 1982, p. 96), then calls for the reform of economic orthodoxy are unsurprising. But while many behavioral economists take that position, others counsel precaution. Upon moving beyond the level of the individual (at which experimental psychology works) to the level of the system (at which experimental economics works), Vernon Smith (1991) reports that markets have remarkable rationality recovering properties.[1]

I likewise take exception with the proximate interpretation placed upon some of the findings of experimental psychology, but my arguments are different. For one thing, I am more concerned with intentional mechanisms than I am with the spontaneous mechanisms of the market. Second, I combine two systems moves: the move from the level of the individual to the level of organization is attended and supported by a move beyond immediate or myopic effects to allow for foresight. I furthermore make allowance for the context in which decisions are made, which brings in the shadow of the past. And I conclude that not orthodoxy but the "rational spirit" which Kenneth Arrow ascribes to economists (1974, p. 16) is what we recover upon bringing the economics of organization to bear.

As developed herein, organization is not merely a problem (in all of the ways that have been described by sociologists, organization theorists, and other students of organization), but <u>organization is often a solution</u>. Upon being advised of a hitherto unrecognized distortion or other regularity, the challenge is to (1) explicate the mechanisms through which it works and (2) ascertain whether feasible improvements can be made.

Problems, as it were, invite solutions—at least in a system in which the resulting benefits can be appropriated.[2] That is a recurrent theme.

I begin by sketching an economic approach in which human actors are described in more veridical terms and where the economizing purposes and effects of organization, to include self-organization, are featured. Applications to consumer behavior and the theory of the firm are examined in Sections 2 and 3, respectively. Concluding remarks follow.

1. An Economic Approach

The three-level schema in Figure 1 locates human actors between the institutional environment on the one hand and the institutions of governance on the other.[3] I begin with a description of each of the levels, next examine the relations between them, and then turn to the criterion issue.

1.1 the levels

(a) human actors

The two key attributes of human actors to which Herbert Simon (1985) makes reference are their cognitive ability and self-interestedness. Directly or indirectly, these same two features make their appearance in every theory of economic organization, but they are variously described.

Orthodoxy ascribes hyperrationality to human actors.[4] The self-interest seeking assumption with which hyperrationality has been paired depends on the context: in the normative public policy tradition, the government is assumed to be benevolent (Dixit, 1996, p. 8); but for the purpose of positive analysis of the private sector, economic actors are given to simple self-interest seeking.

As Hugh Schwartz (1998) observes, hyperrationality has been under criticism since the famous Hall and Hitch paper on markup pricing in 1939. (Indeed, Thorstein Veblen's early 20th century critiques predate this.) The most sustained criticism has come from behavioral economics (especially Simon and others at Carnegie) and experimental psychology (especially Daniel Kahneman and Amos Tversky). Simon proposed that

hyperrationality be supplanted by bounded rationality, according to which human actors are intendedly rational but only limitedly so (1961, p. xxiv). The "behavioral theory of the firm" by Richard Cyert and James March (1963) coupled bounded rationality with the assumption that human actors are myopic. Search, for example, is local and "simple minded"; learning takes the form of trial-and-error; and adaptation by the business firm is described not strategically but as a fire department responding to alarms (immediate crises). Self-interest, in the Carnegie setup, was also nonstrategic: although individuals would engage in subgoal pursuit, such deviations are explained as simple "frailties of motive" (Simon, 1985). Satisficing—the search for a course of action that is "good enough"—supplants maximizing in the Carnegie setup. Efforts to restore maximization by appealing to economic natural selection (Alchian, 1950; Friedman, 1953) were, I think properly, disputed and/or delimited.[5]

Transaction cost economics also subscribes to bounded rationality. Rather, however, than work out of a myopic setup, transaction cost economics assumes that many economic actors (especially within organizations) are capable of and engage in foresight. Such takes on special importance when coupled with the assumption that economic actors engage not merely in simple self-interest seeking but also engage in self-interest seeking with guile. A host of strategic hazards (problems), to which hazard mitigating modes of governance are an adaptive response (solution), come in through this window.

It is furthermore noteworthy that most economic theories describe "representative" human actors, as if only the mean and not the variance mattered. As developed herein, numerous economizing opportunities arise because human actors display cognitive and behavioral variation.

(b) institutional environment

The institutional environment defines the rules of the game to which both human actors and governance are subject. Constraints of both formal and informal kinds originate in the institutional environment (North, 1984, 1991). The formal constraints take the form of laws (e.g., property and contract) and their enforcement (the judiciary) as well as the mechanisms for changing he rules (constitution; polity). The informal constraints describe the conditions of embeddedness (Granovetter, 1985). These include the norms, customs,

and mores of a society, all of which display considerable inertia and many of which are a product of religion.

(c) organization

The arrow within the governance box that turns back on itself is intended to convey the idea that organization, like the law, has a life of its own. Older-style, "machine models" of internal organization emphasized direct, intended effects to the neglect of indirect, unintended effects (March and Simon, 1958, Chap. 3). Upon observing, for example, that something is not working well within an organization, the "obvious" response is to introduce added controls, the intended effects of which are to correct the condition. But while these intended effects may be realized in a team theory setup where human actors have no purposes or agenda of their own, that is a fanciful construction. Because real actors in actual organizations respond to such changes with reference to individual and group interests, more complex responses, to include unintended effects, result. What are often referred to as dysfunctional consequences have these origins, but unintended benefits can also ensue. Whether positive or negative, all significant regularities of an unintended kind need to be uncovered. Once recognized and the mechanisms understood, these are properly entered into the organizational design calculus.

1.2 economic responses

My examination of economic responses to the attributes of human actors, here and in the remainder of the paper, is mainly with reference to transaction cost economics. Accordingly, human actors are described as boundedly rational, given to opportunism, and have the capacity for foresight. All complex contracts are unavoidably incomplete by reason of bounded rationality. Contract as mere promise, unsupported by credible commitments, is not self-supporting by reason of opportunism. And foresight, often coupled with experience, invites parties to look ahead rather than be confronted by surprises, many of which occasion regret.

Although most of the interesting problems of economic organization owe their origins to the conjunction of bounded rationality with opportunism, it will be convenient to focus on responses to problems that are predominantly of one kind or the other.

(a) opportunism

As indicated, perceptive actors will look ahead, recognize potential problems that have their origin in opportunism, and craft ex ante governance structures that will mitigate potential opportunism (in cost effective degree). The large and growing literature on credible commitments (Williamson, 1983; Weingast, 1995) is an outgrowth of this three-way joinder of bounded rationality with opportunism and farsighted contracting. Thus whereas Machiavelli advised his prince to breach contracts with impunity—get them before they get us—transaction cost economics advises contracting agents to give and receive credible commitments. (Penalties for breach are thus provided; added information disclosure and veracity checks are introduced; superior dispute settling mechanisms (such as arbitration) are devised; and, in the limit, troublesome transactions are taken out of markets and brought under unified ownership.)

Interestingly, John R. Commons anticipated many of these developments in his statement that "the ultimate unit of activity…must contain in itself the three principles of conflict, mutuality, and order. This unit is the transaction" (1932, p. 4). Not only does transaction cost economics subscribe to the idea that the transaction is the basic unit of analysis, but it views governance as the means by which order is accomplished in a relation where potential conflict threatens to undo or upset opportunities to realize mutual gains.

Evolutionary biology proceeds similarly. As Richard Dawkins has observed, "One unique feature of man…is his capacity for conscious foresight" (Dawkins, 1976, p. 200). Indeed, it is the "capacity to simulate the future in imagination…[that saves] us from the worst excesses of the blind replicators" (Dawkins, 1976, p. 200). The worst consequences to which Dawkins refers have their origins in selfishness: "a predominant quality of a successful gene is ruthless selfishness" (1976, p. 2)—hence the title of his famous book, The Selfish Gene. Crafting credible commitments to afford relief from myopic excesses is precisely a farsighted construction.

George Schultz's reflections on his experience as an economist are pertinent: "my training in economics has had a major influence on the way I think about public policy tasks, even when they have no particular relationship to economics. Our discipline makes one think ahead, ask about indirect consequences, take note of variables that may not be directly under consideration" (1995, p. 1). The businessman Rudolf Spreckels knew this in his bones: "Whenever I see something badly done, or not done at all, I see an opportunity to make a fortune." Those instincts, if widely operative, will influence the practice and ought to influence the theory of economic organization. Thus although most academics are ill-suited to (or have taken themselves out of) the fortune-making business, there is analytical gold to be mined whenever a condition of inefficiency is displayed.

Opportunism presents potential efficiency gains of two kinds. Mitigating opportunism through governance is the most familiar and most significant source of gain. But the specialization of labor with reference to the differential propensities of individual human actors to engage in opportunism is also important. Accordingly, describing opportunism in terms of both mean and variance is appropriate.

(b) bounded rationality

An immediate ramification of bounded rationality is that all complex contracts are unavoidably incomplete, on which account gaps, errors, omissions, and the like appear. Disturbances which push the parties off of the contract curve thus give rise to inefficiency unless corrective adaptations can be made. Relieving such contractual hazards through governance has been a central focus of transaction cost economics.

But there is a second and relatively neglected aspect of bounded rationality that also has significant organizational design ramifications. Given that "individual human beings are limited in knowledge, foresight, skill, and time…, organizations are useful instruments for the achievement of human purpose" (Simon, 1957, p. 199). Some of these benefits result from simple aggregation, but many accrue to specialization. As with all scarce resources, benefits are realized by deploying mind to more productive purposes.

Edwin Hutchins expresses "surprise that the division of cognitive labor has played such a very minor part in cognitive anthropology" (1995, p. 176) and subsequently observes

that “the cognitive properties of groups are produced by interaction between structures internal to individuals and structures external to individuals...[and that] the performance of cognitive tasks that exceed individual abilities is always shaped by a social organization of distributed cognition” (1995, p. 262; emphasis added). The division of cognitive labor is also underdeveloped in economics. Mean, variance, variety, and group interaction effects are all relevant. The obvious propositions here are these: (1) problems that are too complex can sometimes be broken down into “subassemblies,” within which specialization can take place and composite solutions worked up (March and Simon, 1958, p. 151); (2) upon recognizing that individuals differ in raw ability and expertise, better than average results can be realized by conferring “leadership” (through delegation or imitation) on those with greater ability; and (3) because cognitive ability can take various forms, such variations should be factored in. Also, (4) even if individual consumers are unable to realize the benefits of specialization in cognitive and opportunistic respects by themselves, perceptive businesses and/or public policy can often recognize the resultant inefficiency and take steps to relieve cognitive demands and the hazards of opportunism. Relief is thus realized by indirection.

1.3 the remediableness criterion

The usual criterion for assessing efficiency is that of “first best”—which is a hypothetical ideal in which hyperrationality, benevolence, the absence of transaction costs, costless redistribution, full credibility, and the like are projected. Although heroic assumptions of these kinds can, sometimes, help to get to the essence of things, they often discourage an examination of true underlying problems and can lead to mistaken public policy. As Ronald Coase (1964) observed, a chronic source of public policy error has been to describe one form of organization, such as the market, in realistic terms and a second form of organization, such as regulation, in ideal terms, when, in fact, all feasible forms of organization are flawed.

The remediableness criterion eschews hypothetical ideals. It holds that an extant form of organization for which no superior feasible form of organization can be described and implemented with expected net gains is presumed to be efficient. The relevant

comparisons thus take place across feasible alternatives; costs of implementing change are taken into account; and efficiency is a rebuttable presumption.

Plainly, many extant forms that are declared to be inefficient, perhaps even egregiously inefficient, in relation to a hypothetical ideal will not be inefficient when compared with the best feasible alternative. Even, moreover, if a superior feasible alternative can be described, the costs of implementation may be prohibitive (Williamson, 1996, pp. 203-208; 1999). The presumption of efficiency is nevertheless rebuttable. For example, initial conditions in the polity may be declared to be unacceptable. (As George Stigler (1992) has advised, however, economists need to be respectful of the rationality of politics.) The upshot is that many outcomes that economic theorists and public policy analysts used to classify as inefficient in relation to a hypothetical ideal survive the efficiency test of remediation. That has many ramifications, to include assessing the errors, distortions, and biases of human actors to which inefficiency is ascribed by experimental psychology.

2. Experimental Psychology and Consumer Behavior

According to Hugh Schwartz, "even as late as the 1970s, very little work employing psychology appeared in the professional economics and finance journals….[T]he real breakthrough came as a result of the work of the psychologists Tversky, Kahneman, Slovic, Leibenstein and a sizeable group of others working on the analysis of decision making" (1998, p. 45). As a recent issue of the Russell Sage Foundation News puts it, "a brilliant line of cognitive research led by Daniel Kahneman and Amos Tversky has provided a variety of compelling demonstrations that actual human decision-making frequently violates the basic assumptions of economic theory" (1998). Matthew Rabin's recent article (1998) provides an able survey.

I begin with a summary of what I take to be the key simplifying moves out of which this literature works. As it turns out, these moves are responsible for much of the purported nonrationality.

2.1 simplifying assumptions

On my reading, the evidence in support of bounded rationality is ubiquitous. It is obvious, for example, that chess, unlike tic-tac-toe, is not a trivial game. Conditions of cognitive overload and resulting confusion are familiar. So is recourse to short-cuts, of which the use of routines is an example.

The experimental psychology literature confirms that bounded rationality is the operative condition and demonstrates that individuals take refuge in heuristics—of which representativeness, availability, and anchoring are prominent. Although such findings pose a challenge for orthodoxy, "building a sufficiently general alternate paradigm has proved to be exceptionally difficult. We still lack what both Richard Thaler and Hugh Schwartz call a 'theory of systematic error'—a theory equal in generality and aesthetic beauty to that of utility maximization" (Maital, 1998, p. x). I agree, but building a general alternate paradigm is not the only response. Why not inquire instead into the origins of these purported errors and, if inefficiency resides therein, examine cost-effective responses (in relation to which organization often plays a large role).

The distinction between real errors and purported errors turns on the conceptual framework out of which experimental psychology (and economic orthodoxy) work. The main simplifying moves with which I take exception are these:

(1) The condition of rationality is judged with reference to a hypothetical ideal, very much in the spirit of old-style welfare economics/market failure analysis. As discussed above, many purported failures of markets do not survive comparative institutional scrutiny. The same could be true of many claims of individual irrationality.

(2) The behavior of subjects in the laboratory is judged in relation to featureless plains, which is to say that differential conditions of social embeddedness are ignored in interpreting behavior to be strange or anomalous.

(3) Considerations of intentionality are suppressed, evidently out of respect for the propensity of economists to favor thin (spontaneous)

over thick (intentional) rational descriptions (Ferejohn, 1990, p. 6, n. 10).

(4) The focus is on individuals and consumer behavior, to the neglect of organization and the theory of the firm. Thus Rabin introduces his survey as follows (1998, p. 11):

> Economics has conventionally assumed that each individual has stable and coherent preferences, and that she rationally maximizes those preferences. Given a set of options and probabilistic beliefs, a person is assumed to maximize the expected value of a utility function, U(x). Psychological research suggests various modifications to this conception of human choice. [This survey paper] provides examples of what psychological research can teach us about making U(x) more realistic than under standard economic assumptions.

Accordingly, the object is to work out the ramifications of experimental psychology for the theory of individual decision-making.[6]

(5) Experimental findings emphasize the mean of the laboratory population to the neglect of variance, whence the possibility of relief through organization/delegation/imitation is glossed over.

2.2 some disputed findings

The experimental psychology literature is vast (Rabin, 1998) and my response to much of it is merely to nod in agreement. Such agreement notwithstanding, I express concern over those claims of irrationality and nonrationality that can be ascribed to one or more of the five special conditions to which I refer above.[7]

(a) bad games

Consider responses to "bad games," of which the prisoners' dilemma is the canonical case. The myopic version of the prisoners' dilemma is that two suspected criminals are apprehended and questioned about a crime. In the hope of extracting a confession, each is presented a payoff matrix that invites him/her to confess. Although both would be better off if both were to deny guilt, the calculus leads to what (for them) is a bad outcome: defecting is a dominant strategy.

Ways of overcoming this outcome have mainly emphasized spontaneous mechanisms. Colin Camerer and Marc Knez summarize as follows (1996, p. 94):

> …under three conditions, games which are often classified as social dilemmas are [transformed into] games of cooperation. The first condition is that players get utility from [being nice and] cooperating with others who cooperate…. The second condition is that [if]….players can be excluded from benefiting when others cooperate…then players [can be induced] to cooperate. The third condition is…[to repeat the game] with sufficiently high probability.

The first condition corresponds to conditional reciprocity, with a predilection to begin with a nice move. The second two entail foresight. None of the three, however, contemplate what I would say is the obvious move: take deliberate action <u>to alter the payoff matrix</u>.

The implicit assumptions in the classic game are that the police are clever and that thieves are myopic and suffer from "frailty of motive." Suppose, however, that some thieves (or their managers, perhaps the mafia) have the capacity to look ahead while the robbery is in the planning stage. Suppose that they not only recognize that they might be suspected of committing the robbery, but they also perceive the possibility of being presented by the police with the payoff matrix of the prisoners' dilemma. In anticipation of this dilemma, and so as to better assure that neither defects, they take advance actions that penalize the defection option and make cooperation the dominant strategy.[8] The farsighted or augmented game thus "defeats," as it were, the myopic game with which they would otherwise be confronted.[9]

Predisposed to work out of spontaneous mechanisms, many economists eschew purposeful efforts to craft credible commitments. If, however, individuals have the capacities to recognize and reconfigure bad games, then the neglect of intentionality will miss some of the action. A researchable question, to which laboratory experiments could be applied, is what are the limits of intentionality, if players are afforded this option, in the repeated play of bad games. Such work is beginning to take shape (McCabe, Smith, and LePore, 1998).

(b) general-purpose problem solving

The model of the mind to which economic orthodoxy and experimental psychology refer is that of general purpose problem solver. Upon discovering that individuals have limited abilities and strange preferences, experimental psychologists conclude that individuals are irrational (as judged with respect to the hypothetical ideal). Interestingly, evolutionary psychology works differently (Cosmides and Tooby, 1994,p. 328):

> By identifying and modeling the adaptive problems humans faced during their evolution, researchers can make educated guesses about the designs of the complex computational devices the human brain embodies, and about many of the specific design features they required to be able to solve these problems. Armed with these models, researchers can then design experiments that can detect and map the features of these complex devices—features that no one would otherwise have thought to test for.

That it makes a difference whether we view the mind as a specialized problem-solver, as against a general-purpose system (using methods drawn from logic, mathematics, and probability theory), is evident from alternative ways of posing the "medical diagnosis problem." Because probabilistic problems can be posed in more than one way, some of which are more transparent and relate more to evolutionary success than do others (see especially the exchange between Gerd Gigerenzer (1996) and Kahneman and Tversky (1996)), it makes a difference how a problem is formulated (Gigerenzer and Hoffrage, 1995).

The usual formulation is as a problem in statistical decision making ability, in the general-purpose problem solving tradition. A common finding is that serious error results from base-rate neglect. As presented to faculty, staff, and fourth-year students at Harvard Medical School, the problem is this (Cosmides and Tooby, 1996, p. 21):

> If a test to detect a disease whose prevalence is 1/1000 has a false positive rate of 5%, what is the chance that a person found to have a positive result actually has the disease, assuming that you know nothing about the person's symptoms or signs? _____%

The correct answer of 2% was answered by only 18% of those tested. The most common answer was 95%. Evidently "the laws of chance are neither intuitively obvious, nor easy to apply" (Kahneman and Tversky, 1972, p. 431). Unable to do better, individuals resort to heuristics that often lead to error.

Because, however, "making accurate judgments under uncertainty is an important adaptive problem," both now and in the Pleistocene, that poses a puzzle: "Why would natural selection have designed a mind with error-prone heuristics rather than an accurate calculus of probability" (Cosmides and Tooby, 1996, p. 11)? Leda Cosmides and John Tooby observe in this connection that (1996, pp. 15-16):

> What was available in the environment in which we evolved was the encountered frequencies of actual events—for example, that we were successful 5 out of the last 20 times that we hunted in the north canyon. Our homonid ancestors were immersed in a rich flow of observable frequencies that could be used to improve decision-making, given procedures that could take advantage of them….
>
> There are advantages to storing and operating on frequentist representations because they preserve important information that would be lost by conversion to a single-event probability.

That is, 5 out of 20 contains more information and is easier to update than is .25. Cosmides and Tooby thereafter "suggest that the human mind may contain a series of well-

engineered competences capable of being activated under the right conditions, and that a frequentist competence is prominent among these" (1996, p. 17).

On the possibility that human actors are better probabilists when probabilities are presented in frequentist terms rather than as point estimates, the medical diagnosis problem was posed in a more intuitive way in which frequencies are featured (Cosmides and Tooby, 1996, p. 24):

> 1 out of every 1000 Americans has disease X. A test has been developed to detect when a person has disease X. Every time the test is given to a person who has the disease, the test comes out positive (i.e., the "true positive" rate is 100%). But sometimes the test also comes out positive when it is given to a person who is completely healthy. Specifically, out of every 1000 people who are perfectly healthy, 50 of them test positive for the disease (i.e., the "false positive" rate is 5%).
>
> Imagine that we have assembled a random sample of 1000 Americans. They were selected by a lottery. Those who conducted the lottery had no information about the health status of any of these people.
>
> How many people who test positive for the disease will actually have the disease? _____ out of _____

Posed in this manner, the correct answer of 2% was reached by 56% of the subjects, which increased to 76% when additional questions were posed that required subjects to disclose their understanding of the information provided. Evidently it matters a lot if problems are posed abstractly or in a manner that is congruent with frequentist mechanisms that had evolutionary advantage. If the object is to ascertain "how our minds work," then evolutionary considerations ought to figure prominently in experimental designs.

(c) statistical knowledge

One illustration of the neglect of context is to ascribe error to people who "weight salient, memorable, or vivid evidence even when they have better sources of information. For instance, our assessment of a given city's crime rate is likely to be too influenced by

whether we personally know someone who has been assaulted, even if we are familiar with much more relevant general statistics" (Rabin, 1998, p. 30). This is purportedly irrational.

Evidently indirect (statistical) knowledge is more scientific and therefore better than direct knowledge. But then again, maybe not. If a city, on average, is fairly safe, but if that varies a lot among neighborhoods, and if my friend has been assaulted nearby, then I may want to entertain the possibility that I am at greater jeopardy than the "more relevant general statistics" suggest. More generally, a person who is concerned with his/her safety will be sensitive to information about people with life styles that are known to be similar.

Also, it does not take long to learn that it is easy to "lie with statistics." General statistics that are believed to originate with politicians or bureaucrats who have an agenda will be discounted by those with "street smarts" of a direct knowledge kind. Thus although folk wisdom has pitfalls, it is sometimes functional and can never be obliterated from the laboratory.

(d) money illusion

Or consider what to make of the observation that individuals interpret wage and price changes in nominal rather than real terms when wage and price changes are posed in the abstract. According to Rabin, fairness is to be inferred from the fact that "people are very attentive to nominal rather than real changes in wages and prices in assessing the fairness of firm behavior. For instance, a nominal wage increase of 5% in a period of 12% inflation offends people's sense of fairness less than a 7% decrease in a time of no inflation" (1998, p. 37).

Suppose, however, that people relate to abstract questions with reference to their <u>experience</u> (Smith, 1991, p. 878). Suppose, in particular, that (1) 12% is an abnormally high rate of inflation, 4% is the median rate, and 0% is extremely unusual, and (2) it is customary for wages to track price level changes with a lag (there is smoothing). In that event, the fact that the wage increase this period did not match the 12% inflation level is easily interpreted as a lagged response, for which catch-up will prospectively be forthcoming. This is just business-as-usual. A wage decrease, however, of 7% at a time of zero inflation is a much more troubling event. This is not part of a normal lagged adjustment process but signals

real concern. Who proposed this? Who agreed to it? Is this due to temporary adversity? How are the burdens of adversity being shared? What strategic purposes are being served? Should I look for another job? Such concerns will be much greater, moreover, among workers who have made firm-specific investments in human capital than for workers with generic skills (for whom the market affords ready relief if strategizing is perceived to be operative). Relatedly, workers who have a bilateral dependency relation to the firm and perceive strategic hazards will have an incentive to negotiate safeguards for the future.[10] Folk wisdom and calculativeness, rather than money illusion and norms of fairness, are what drive this second interpretation.

To be sure, fairness and contextual explanations are not mutually exclusive. The advantages of the latter are that it probes additional and often deeper issues and it applies in a more discriminating way.[11]

(e) event matching

The event matching phenomenon is described by Schwartz as follows (1998,pp. 141-142):

> Event matching is a procedure whereby people match their behavior to the properties of rewarded trials. (An example offered by Antonides concerns the approach of riders to catching a bus. If the bus arrives late one-third of the time, then while it might seem rational to be at the bus stop on time, an event matching strategy would be to be there only two-thirds of the time.)

If, upon observing that bus riders behave in the manner described, do we conclude that rationality has given way to a mistaken heuristic? Might the frequency of buses influence the behavior? Should bus riders who display this behavior be expected to behave similarly at airports if planes are late one-third of the time? If the observed regularity is highly conditional on the circumstances, don't we need to pay more heed to the latter?

(f) status quo basis

Consider the "status quo bias," which is a manifestation of "loss aversion" (Rabin, 1998, pp. 14-15; emphasis in original):

> …loss aversion implies that individuals tend to prefer the status quo to changes that involve some losses of goods, even when these are offset by gains of other goods…. [For example, consider] randomly giving one set of students candy bars, and the remaining students a mug. Later, each student was offered the opportunity to exchange her gift for the other one—a mug for a candy bar or vice versa. Ninety percent of <u>both</u> mug-owners and candy-owners chose not to trade. Because the goods were allocated randomly and transaction costs were minimal, the different behavior for the two groups of subjects presumably reflected [status quo] preferences that were induced by the initial allocation.

There being no place for status quo bias in the orthodox setup, one response to the above-described behavior is to reformulate the utility function so as to bring individual rationality into congruence with the status quo bias referred to. That raises the question of whether to ascribe such bias/reformulated utility function to transactions in general or only a subset thereof. Which? Why? Also, might this bias vary among societies and over time?[12]

This last brings in social conditioning: if the monetary values of candy and mugs are approximately equal, a readiness to trade can be interpreted as an unseemly violation of the norm in societies where those who receive gifts are expected to be appreciative.[13] Why not just "conform in small things," especially if the behavior in question is being observed and recorded (and, possibly, interpreted) in the laboratory (Hoffman, McCabe, and Smith, 1996, p. 658). In that event, status quo bias gives way to social conditioning—the efficacy of which will vary among transactions, societies, and over time.

(g) brute rationality

The behavior of individuals playing the "dictator game" and the "ultimatum game" is also a puzzle, in that brute rationality is violated. The dictator game awards the dictator with a fixed sum of money and asks him to divide the money between himself and an unknown stranger. Typically between 20 and 40 percent of dictators keep the entire amount, but the remainder share the money, sometimes equally (Fehr and Schmidt, 1997, p. 5). The ultimatum game (Rabin, 1996, pp. 21-22; emphasis in original):

> …consists of two people splitting some fixed amount of money according to the following rules: A Proposer offers some division of (say) $10 to Decider. If the Decider accepts, they split the money according to the proposal. If the Decider rejects, they both get nothing. The result of the rational self-interest is clear. Proposers will never offer more than a penny and the Decider will accept any offer of a least a penny. Experiments clearly refute such behavior.

As Ernst Fehr and Klaus Schmidt have shown, these (and related) games can be given a rational interpretation by postulating a utility function with "inequality aversion," by which they mean that "in a given situation a person has a positive willingness to pay for a reduction in inequality between himself and some relevant others who are affected by his actions" (1997, p. 5). This modest reformulation of the utility function brings otherwise deviant (nonneoclassical) behavior into congruence with utility maximization.[14]

Consider, however, another possibility: individual utility maximization, for some subset of individuals, is constrained by the principle "neither make nor accept insulting offers." In that
event, neither dictator nor decider will display the grasping mentality that (under pure theory) is postulated.

To be sure, "principled behavior" is an ad hoc move. It is not, however, something to which we are unable to relate, recognize, and describe. Why does "game rationality" trump "principled behavior" when the two collide? Why should individuals whose self-image is to behave consistently be expected to check their principles at the cloakroom as they enter the laboratory?[15] Such persons as Proposers would never offer only a penny, and such persons as Deciders would never accept only a penny.[16] And there are further ramifications. Not only will principled Proposers make better offers than a penny, but those who have few scruples over taking full advantage will also be deterred from offering only a penny (on the possibility that they have had the misfortune of being paired with a principled Decider). In

that event, the brute rationality of the ultimatum game will not play out (Ben-Ner and Putterman, 1998, p. 19).

Indeed, viewed through the lens of evolutionary psychology, the "anomalous results" in ultimatum games could well be the product of evolutionary selection pressures (Cosmides and Tooby, 1992, pp. 179-221). Elizabeth Hoffman, Kevin McCabe, and Vernon Smith advance

the following interpretation of the social interaction in question: "people have unconscious, preprogrammed rules of social behavior that suit them well in the repeated game of life's interactions with other people. These patterns are imported into the laboratory" (1996, p. 659).

2.3 perspectives

Many critiques of economics understandably focus on orthodoxy—which after all, is the main case and is what the textbooks feature. Rationality, however, is a much broader concept than neoclassical economics (Arrow, 1974; Simon, 1978). This broader concept of rationality is what I recommend here.

My argument parallels earlier experience in the field of industrial organization. The orthodox description of the firm during the 1960s (which still populates the microtheory textbooks) was as a production function (which is a technological construction). Efficiency is thus realized by economies of scale and scope, but that was the extent of it. Vertical integration that lacked a "physical or technical aspect" (Bain, 1968, p. 381) and nonstandard and unfamiliar contracting and organizational practices did not qualify. There being no technological justification, such vertical structures and strange practices purportedly had anticompetitive purpose and effect. There being a lot of organizational variety for which technology played no apparent role, monopoly was believed to be widespread (Coase, 1972, p. 67):

> …if an economist finds something—a business practice of one sort or other—that he does not understand, he looks for a monopoly explanation.

> And as in this field we are very ignorant, the number of ununderstandable practices tends to be very large, and the reliance on a monopoly explanation, frequent.

This unsatisfactory state of affairs was overcome by adopting a broader concept of efficiency in which economies of organization (as well as of technology) were admitted. Upon describing the firm-as-governance structure (which is an organizational construction), economies of transaction costs were brought forward. The upshot is that organization mattered not merely in monopoly respects but, much more consequentially, in economizing respects as well. Public policy toward firm and market organization, as well as public policy more generally (Dixit, 1996), was reshaped in the process.

The individual, even more than the firm, is a distinctly limited "technology." All the more reason, therefore, to ask whether the individual, like the firm, can benefit from moving beyond the level of the individual to introduce elements of governance/association/organization. Can some of the successes that transaction cost economics has had in describing the firm as a governance structure also be repeated by expanding the domain of consumer choice to include governance supports?

(a) imitation

The experimental psychology literature focuses on mean to the neglect of variance: <u>on average</u>, individual decision makers commit certain errors, display certain biases, use certain heuristics, etc. But rarely do the experiments reveal that the entire population behaves uniformly. Instead, although subjects display behavior centered on the mean, some do worse and a few do better (where better is normally judged with reference to hyperrationality, but could be judged in the less ambitious terms of reaching a superior feasible result in a timely manner).

Assuming that those who are less qualified can identify those who are more qualified—to buy audio equipment, go vacationing, get medical care, etc.—then subjects with average or below average experience or talent can benefit by imitating those who have more. Note, moreover, that expertise may vary among classes of activities. Some individuals are perceived to be good probabilists, others to have good spatial skills, others to

have deep knowledge of music, etc. Individuals who are perceptive of their own limitations, can identify those with superior skills, and can gain access to those skills will often do better by imitating. Except, therefore, as obstacles to imitating success are too great, possibly because there are serious noncomparabilities, or there are other impediments (including societal, such as a caste system) to imitation, many individuals will do better "in life" than would be predicted by their performance in the laboratory.

(b) contextual

The idea that more calculativeness is better than less overlooks the possibility that calculativeness can be pushed to dysfunctional extremes. Interaction effects among transactions or during the execution of a contract sometimes need to be taken into account. As against the advice to squeeze relentlessly on all margins, some individuals recognize that the best deals are ones where "some money is left on the table." Given that all complex contracts are incomplete, and that many will require the cooperation of both parties during contract execution, the initial bargain and the implementation of the contract may not be independent. If squeezing here invites noncooperation there, then farsighted contracting agents will take that into account.[17] The carry-over of such practices from life into the laboratory could result in perceived failures of rationality.

(c) commercial assists

Although fly-by-night firms and frauds are interested in bilking unwary consumers, many firms (1) are interested in remaining in business for a long period of time, (2) recognize that they enjoy a huge information advantage over consumers, and (3) furthermore recognize that consumers will factor perceived risks into their purchasing decisions. Firms with these three attributes will recognize that crafting credible commitments will yield mutual gains. With or without risk aversion on the part of consumers, the hazards associated with information disparities can often be relieved if firms invest in brand names, standardize, provide additional information, sell through qualified sales representatives, provide warranties, and attempt to communicate confidence in other ways. To be sure, firms will make these decisions with reference to the profit calculus rather than a social welfare calculus. Significant relief in relation to the initial or "unassisted" state

of information asymmetry can nevertheless be realized by the perceptive responses of firms to the perceived needs of consumers. In that event, rationality limits will be relieved by indirection.

Consumers, moreover, can orchestrate self-help by organizing consumer cooperatives—and that is sometimes observed as well. The need for such self-help is nevertheless mitigated if perceptive firms take the initiative.

(d) public policy

Among the more serious problems for consumer choice are transactions for which (1) consumers are especially incompetent, (2) consumers have especially high discount rates, and (3) products or services have latent hazards which manifest themselves only with long delays and can be disguised or denied (especially if the costs can be evaded). Also, (4) firms that are contemplating exit may play end games. Public policy responds to the first by passing special protective arrangements for minors and for those who are judged mentally incompetent. There is no easy way to deal with those who live in the present by discounting the future very heavily. Making the sale or use of some products (e.g., drugs) unlawful is one response, but this also invites evasive market responses.

Public policy for goods and services that have delayed health and safety features is discussed elsewhere (Williamson and Bercovitz, 1996). These are not easy issues, often because corporations can shed their responsibilities for long-denied adverse effects by protecting the officers through diffuse responsibility and escaping judgments against the corporation through bankruptcy.

3. Theories of the Firm

3.1 some comparisons

It will be useful, for purposes of perspective, to begin with a comparison of how theories of the firm differ in their cognitive and self-interest seeking assumptions. Three types of self-interest seeking are distinguished: selflessness (or benevolence); simple self-interest seeking, whereby human actors will self-enforce all promises; and strategic behavior or opportunism, according to which human actors are given to self-interest seeking with

guile. The main cognition distinction is between hyperrationality and bounded rationality. The latter, however, is further subdivided into myopia and foresight. Alternative theories of the firm are located in relation to this 3x3 description in Table 1.

Normative public finance, neoclassical theory, and game theory/agency theory all work out of a hyperrationality setup but differ in self-interestedness respects. Early objections to hyperrationality by Veblen and others were mainly dismissed by orthodoxy, there being little systematic effort to develop a constructive alternative, but Carnegie finally rose to that challenge. Upon substituting bounded rationality for hyperrationality, maximizing was replaced by satisficing (Simon, 1955) and the behavioral theory of the firm (Cyert and March, 1963) was advanced. As between myopia and farsight, Carnegie treated human actors as myopic. In combination with the simple self-interest seeking in the Carnegie setup—"frailties of motive" (Simon, 1985) or "docility" (Simon, 1991)—strategic behavior was effectively disallowed.

Team theory is also a bounded rationality construction but substitutes farsighted contracting for myopia. Self-interest, in the team theory setup, corresponds to benevolence—which is to say that there are no agency problems (subgoal pursuit). Transaction cost economics combines bounded rationality/foresight with opportunism—which combination leads into the study of credible contracting and the governance of contractual relations—broadly in the spirit of the analytic opportunity posed by Commons in which the three "principles" of conflict, mutuality, and order are joined.

3.2 introducing variance

The foregoing describes theories of the firm with reference to the mean attributes of human actors. That suffices for many purposes, but variance among human actors—in cognitive, self-interested, and farsightedness respects—could also be consequential. That, plainly, is Mary Douglas's position. Thus although she views transaction cost economics as responsive to many of the unmet needs of organization theory (Douglas, 1990, pp. 100-102), it makes no provision for differences among individuals: "[Williamson] believes firms vary, but not individuals" (Douglas, 1990, p. 102).[18]

My purpose here is to develop more systematically the way in which variance among human actors, in both cognitive and opportunism respects, manifests itself in the design of efficient economic organization. As hitherto stated, economic organization is often a solution to problems—both at the level of the individual and those that arise within. Regarding the latter, farsighted economic actors who are concerned with the performance of the entire enterprise, rather than of the parts thereof, can and often do recognize that organization form is a decision variable that can be and is deployed to economize on bounded rationality and attenuate the hazards of opportunism.[19]

Organization can take many forms. It will be instructive to begin with conditions for which the peer group is an entirely adequate form of organization and move into hierarchy by degree, as cognitive and behavioral "complications" build up. Extensions upon this simple setup to make allowance for (1) greater cognitive variety, (2) the proposition that organization has a life of its own, (3) differences in transactions, and (4) differences in the institutional environment are then introduced in 3.3.

The implied theories of the firm that accrue to each of the six different specifications of bounded rationality and opportunism are examined here. Only gross distinctions are attempted, which is to say that I sacrifice depth for breadth. Although there are no individual surprises, there was (for me at least) a composite surprise—in that I did not expect to find that "our view of the human beings whose behavior we are studying" (Simon, 1985, p. 303) was so broadly determinative of our research agenda.

All six theories assume that human actors are subject to bounded rationality, the population mean of which is given by $\overline{\mathrm{B}}$. Two variants of bounded rationality are examined. The first variant projects a uniform condition of bounded rationality, which is to say that there is zero cognitive variance among members of the population. The second variant treats $\overline{B}$ as the first moment and $\sigma_B^2 > 0$ as the second moment.

Three conditions of opportunism are distinguished. Although the absence of opportunism is properly reserved for the saints, the utopian appeal of zero opportunism is strong. I therefore begin with zero opportunism, next turn to uniform opportunism of mean

$\bar{S}$ and variance σ_S^2 = 0, and finally consider variable opportunism of mean $\bar{S}$ and variance $\sigma_S^2 > 0$.

For the purposes of this six-way exercise, all members of the population are assumed to have identical physical ability and, cognitive ability held constant, equal aptitudes for all tasks, including administration. The six combinations to be examined are designated by Roman numerals I through VI, with I being the easiest condition to organize and VI being the most complex. Consider each of the cells in Table 2.

Condition I ($\bar{B}$, 0; 0, 0)

Condition I is that for which bounded rationality obtains in uniform degree and opportunism is altogether absent. This condition would support the peer group ideal, according to which tasks are specialized and—inasmuch as talents are equally distributed, and assuming that jobs vary in satisfaction and that diminishing returns to repetition set in—it is both feasible and efficient for each person to be successively rotated through each job at appropriate intervals. Accordingly, "everybody will take it in turn to carry out administrative work, in which the differences between 'director' and 'directed' will be abolished" (Mandel, 1968, p. 677).[20] Since the contributions of all members over the work cycle are identical, all members will share equally in the economic product of the peer group (or unequally if objective needs—family; health—differ).

To be sure, ideal peer groups of this kind will benefit from rules to coordinate work flows and facilitate adaptation. Under the assumptions of Condition I, such rules will be designed without reference to strategic concerns—because there are none. The absence of opportunism, within or between groups, also means that there is no occasion for internal organization to supplant markets on account of contractual hazards. Accordingly, peer group size will reflect considerations of technology (economies of scale and scope) and associational benefits but will not be driven by differential contractual hazards as between markets and hierarchies.

Condition II ($\bar{B}$, σ_B^2 ; 0, 0)

Condition II is that for which bounded rationality is now present in variable degree but opportunism remains absent. Given the latter, everyone will continuously make best efforts. Since differential compensation is unneeded to elicit effort, the membership could, in principle, share equally in the total product of the group.

But while no distribution problem arises, an allocation problem is posed by variation across the membership in terms of bounded rationality. Thus assume that all groups are of size N, that there are N jobs in each group, and that groups and jobs are such that talent and job difficulties are uniformly distributed over the interval 1 to N. Assume further that assigning a person of talent j to job k results in the job being done in the fraction j/k if $j < k$ and in full degree ($j/k = 1$) if $j \geq k$.[21] And assume finally that the productive value of job k is k if done by a fully qualified individual ($j \geq k$) and is $(j/k)k = j$ if $j < k$.

If the total product of a group is the simple summation of the product of its members (subject to the above under- and over-classification constraints), then the maximum product of a group is $\sum_{k=1}^{N} k$. That maximum will be realized, however, only if talents are precisely matched with tasks. Either the rotation arrangement of the ideal peer group must be sacrificed, or total product will be reduced below maximum. Even, therefore, in an opportunism-free population, cognitive variance means that the "rotation ideal" of the peer group mode of organization entails tradeoffs. As Ugo Pagano observes, such variance "offers a normative justification for the hierarchical structure of the firm" (1991, p. 318).

Condition III ($\overline{B},\ 0;\ \overline{S}, 0$)

Condition III joins uniform bounded rationality with uniform opportunism. Peer group organization is now beset with a series of opportunistic hazards: oligarchy sets in; sharing invites shirking; and asymmetric information invites strategizing.

Oligarchy appears if those to whom administrative work is first assigned have or develop a preference to remain as directors and can take actions to entrench themselves in leadership positions. In that event, the Iron Law of Oligarchy applies: "It is organization which gives birth to the dominion of the elected over the electors, of the mandatories over

the mandators, of the delegates over the delegators. Who says organization, says oligarchy" (Michels, 1962, p. 365). Because, however, the hazards of oligarchy can be anticipated—by those with direct experience, interested outside observers, and students of organization— organizations can be expected to take ex ante actions to mitigate these hazards, of which term limits is one.[22]

Opportunism also poses incentive problems for the practice of equally distributing the product of the group. If effort expended is a disutility, then opportunistic parties cannot be expected to fully and accurately report on the information to which they enjoy privileged access, of which work effort is one. The peer group practice of sharing the total product equally with all members now requires the support of monitoring and metering, whether the jobs are separable (the technology described in Condition II) or nonseparable (Alchian and Demsetz, 1972). More elaborate rules and regulations will also be developed, the object being not merely to promote instrumental purposes but also to deter opportunism.

Discretionary practices that promote efficiency and are permitted under Condition I are thus narrowed or disallowed because of opportunism. Also, so as to check the degree of information asymmetry, auditing will appear. Yardstick comparisons with other organizations may also be employed, after which imitation of best practices by others will be attempted. Inasmuch as all members are identically endowed with cognitive ability and have a common interest in checking a uniform propensity for opportunism, the membership of the Condition III organization unanimously agrees ex ante to take steps to place checks on opportunism (in cost-effective degree), which corresponds to the Armen Alchian and Harold Demsetz (1972) description of teams.[23]

Condition IV: $\left(\overline{B}, \sigma_B^2 ; \overline{S} , 0\right)$

Condition IV introduces differential cognitive competence but continues to project a uniform propensity for opportunism (although such a "uniform" propensity is compromised by differential cognitive ability, in that those who are more clever will enjoy added degrees of freedom). Obvious consequences for organization are to screen for differential competence before making job assignments, which in the context of opportunism could lead to what is

often regarded as “inefficient” signalling (credentializing), but which, often, is irremediable—hence is not inefficient in any comparative institutional sense.

All of the issues of merit assignment that are posed by Condition II reappear, compounded by the propensity of human actors to behave strategically. Since everyone has an identical propensity to behave opportunistically, the costs of which are evident to all, added information disclosure and restraints on admissible behavior will appear. As compared with Condition III, however, three complications now arise: (1) rotation among jobs no longer occurs, or at least comes at a cost, (2) those individuals who are more competent will be able to tilt the rules that govern opportunism in their favor, and (3) incentive pay issues are now posed.

Thus whereas deviations from the pure peer group ideal did not preclude equal sharing if opportunism was presumed to be absent (Condition II) or if rotation could be preserved (Condition III), equal sharing now comes at a cost under Condition IV. Specifically, the most capable individuals in the high skill jobs who have the most influence on organizational design will face a tradeoff if, instead of the simple additive productivity relation described under Condition II, productivity is multiplicative (Calvo and Wellicz, 1979). In that event, the self-conferred latitude of those in the higher talent jobs will generate compound productivity losses as these are “communicated” to across lower levels in the organization (Mayer, 1960). That can be discouraged by abandoning the equal sharing rule and making individual compensation vary positively with both total product of the group and with the level of organization.[24]

Note, moreover, that differential compensation has further ramifications for economic organization if such differentials are easier to support between firms than within firms. In that event, less vertical integration will be observed—which is to say that higher levels in the talent hierarchy will prefer to deal with lower levels through autonomous contracting, rather than include them under unified ownership, ceteris paribus. In the degree to which cultures vary in their capacity to tolerate within-group (as against between-group) compensation disparities, more subcontracting will be observed in cultures where large within-group disparities pose greater strain, ceteris paribus.[25]

Condition V: $\left(\overline{B}, 0; \overline{S}, \sigma_S^2\right)$

Condition V combines uniform bounded rationality with variable opportunism. Screening will now be done within firms with reference to opportunism. Specifically, those jobs that benefit most from being administered by more principled agents will be staffed with less opportunistic employees, ceteris paribus. More principled agents will thus be assigned to jobs for which measurement is more difficult and will be asked to manage interfaces where cooperation is more important.

This latter applies also to interfirm trade. Thus assume that the firm contracts out for two types of components: some are generic while others require investments in specialized assets and pose hazards of bilateral dependency. Suppose further that the firm is able to distinguish among job candidates who apply to work as contract managers in terms of their individual propensities to behave opportunistically. And suppose finally that mutual expected net benefits accrue when parties on both sides of bilaterally dependent transactions have the respect and confidence of his/her opposite. In that event, the "optimal" assignment of managers to contracts will entail discriminating alignment: more opportunistic contract managers will be assigned to generic transactions and those who are less opportunistic (more principled) will be asked to manage bilaterally dependent transactions, ceteris paribus. The realization of value through discriminating alignment thus extends to include considerations of personal integrity. Issues of a (differential) probity kind are posed (Williamson, 1999).

Additional organizational responses can be projected if some (nonseparable) activities are more immune to opportunism than others. For example, the highly standardized and repetitive practices associated with a mature industry usually afford fewer opportunities for discretion than do the variable and rapidly changing practices in a high technology industry, where time is often of the essence. Ceteris paribus, efforts to screen out more opportunistic agents become more important for the latter. (There will be tradeoffs, however, if opportunism and entrepreneurship are positively correlated.)

Condition VI ($\overline{B}, \sigma_B^2 ; \overline{S}, \sigma_S^2$)

Condition VI describes the world as we know it. Screening with respect to both cognition and opportunism will appear. The full panoply of hierarchical incentives and controls will be observed. Complex compensation and boundary of the firm issues are posed.

Table 3 summarizes the main results. Conditions I and II are utopian and describe the peer group ideal and merit assignment ideal, respectively. Condition III puts modest strain on the peer group while merit assignment is subject to severe strain under Condition IV. Transaction cost economics has been principally concerned with Condition V while tradeoffs proliferate under Condition VI.

The main purpose of this six part exercise is to illustrate how organization varies systematically to variance in the attributes of human actors. Even if "everyone knew all of this" all along, it is nonetheless instructive to "witness," as it were, organization form successively unfold to the added problems that are posed as more complex human actor specifications are introduced. That organization undergoes systematic changes in response to more complex specifications repeats the basic theme of this paper: organization is and ought to be regarded as a solution to the "problems" that human actors pose. By way of overview, note the following regularities:

(1) Given bounds on rationality, hierarchy (in variable degree) appears for all six conditions.[26]

(2) The absence of variance, in both bounded rationality and opportunism, supports the peer group (or near-peer group) mode of organization. In effect, the peer group mode works well if the entire population has been cloned (in cognitive and self-interest respects) but the peer group encounters problems, for which other modes of organization afford relief, as variance is introduced.[27] Understandably, the peer group mode of organization has lasting attractions (Manuel and Manuel, 1979). Social scientists nevertheless need to come to terms with its utopian limitations.

(3) The absence of variance on opportunism in combination with variance on bounded rationality favors screening and assignment strictly with respect to merit (cognitive competence).

(4) Really interesting incentive and control problems do not appear until variance on opportunism is introduced.

The whole is larger than the sum of the parts. Thus although there are no individual surprises associated with any of the six conditions, there is a composite surprise—in that so many ramifications about economic organization accrue to such a simple setup.[28]

3.3 Extensions

The foregoing illustrates the proposition that economic organization is conditional on the attributes of human agents. New issues are posed as additional sources of variety are introduced.

(a) cognitive specialization

The foregoing assumes that cognitive competence is a scalar rather than a vector. If, however, there are a variety of cognitive tasks (computational, linguistic, design, etc.), then further specialization will be observed in these respects. Even, therefore, if "composite competence" is judged to be identical for every member of the population, underlying variety across cognitive attributes implies that peer group rotation arrangements, according to which each member of a group moves successively across all tasks (including administration), will incur opportunity costs.

(b) organization has a life of its own

Recall that the arrow in the governance box in Figure 1 turns back on itself because organization has a life of its own. Such regularities have an intertemporal quality and many are initially unanticipated.

Such effects are often subtle, partly because they operate with delays and are spontaneous rather than intentional. Many of these unintended effects take the form of costs, but some are unanticipated benefits. Whatever the effects, failure to take them into account in the organizational design implies an unrealized gain—in that reorganization can

mitigate hitherto unrecognized costs and augment unrecognized benefits. In effect, remediable market failures and remediable organizational failures both invite "internalizing the externalities," once these effects are detected and the ramifications worked out (including implementation costs). Specific applications to internal organization, which I have discussed elsewhere (Williamson, 1996, pp. 226-228), include (1) demands for control, where unintended and often dysfunctional consequences have been brought to the attention of economists by sociologists of organization, (2) oligarchy, whereby incumbents develop attachments for office and entrench themselves (see above), (3) informal organization, which arises silently and often in support of, but also constrains, formal organization, and (4) bureaucratization, with special emphasis on the intertemporal costs that attend internal organization.

Also, organizational learning is pertinent. As Daniel Levinthal and James March (1993) develop, organizations use both simplification mechanisms and specialization mechanisms to help them learn. Such mechanisms nevertheless come at a cost—of which myopic tendencies to (1) ignore the long run, (2) ignore the larger picture, and (3) overlook failures are especially important. Myopia of the first kind results from the fact that "learning in one domain is likely to be rewarding in the short run, but it leads to a longer-run potential decay of adaptive capability in other domains" (Levinthal and March, 1993, p. 102). Myopia of the second kind involves subgoal pursuit at the expense of the larger picture, free-riding on the innovative efforts of others being an example. Myopia about prospects is due to the bias that results from rewarding success: "because organizations promote successful people to positions of power and authority," an undervaluation of failures results (Levinthal and March, 1993, p. 105).

The transaction cost economics response to all biases, including those that accrue to organizational learning, are (1) to make note of the regularity, (2) work out the ramifications for efficient organization, and (3) fold these into the organizational design with reference to the remediableness criterion. The object is not to annihilate unanticipated effects but, upon being advised of a regularity, to take such effects seriously and work out best responses. Consider the three myopic tendencies to which Levinthal and March refer. Propensities to

ignore the long run can be relieved by multidivisionalization in which a strategic design capability is introduced (Chandler, 1962). Dealing with the larger picture, as where the "system as a whole underinvests in exploration" may be irremediable, in that it is prohibitively costly to orchestrate an interfirm collective response. (By contrast with the path dependency literature, which describes system underinvestments as failures, whether remediable or not, transaction cost economics counsels that only remediable complications are properly described as failures.) Similarly, the success biases that result from rewarding success with promotion are not discredible unless a superior promotion scheme can be devised.

(c) transactions

The discriminating alignment hypothesis operates at the generic level of governance: market, hybrid, hierarchy, etc. Given the attributes of a transaction, the object is to identify the least cost mode of governance. Additional ramifications can be developed by taking variations in transactions and human actors simultaneously into account. As discussed above, economizing purposes are served by reserving higher degrees of cognitive competence and lower degrees of opportunism for transactions that have greater needs for attributes of both kinds. Accordingly, the "best minds" will be aligned with the most demanding transactions—as in high technology industries where real-time responsiveness is of the essence. (The management and finance of Silicon Valley firms will not, therefore, be managed by a random sample of the cognitive distribution.) Also, as the hazards of opportunism increase with added complexity and uncertainty, more complex governance (to include added screening and social conditioning and more careful interface alignment) will be observed. Firms to which "good reputation" effects are especially important will thus be observed to concentrate their hires on subsets of the population that display greater integrity, ceteris paribus.

(d) embeddedness

It is elementary that we need to make provision for both the formal and informal features of the institutional environment in interpreting institutional change over time and in

making comparisons between nation states in a point in time (Henisz, 1998; La Porte, et al., 1998). Ordinarily these differences are taken as given. That, however, is unduly passive if, after discerning which conditions of embeddedness are especially productive, it is possible to prescribe "optional rules of the game."

As with many such prescriptions, that is easier said than done. For one thing, we understand less about embeddedness than many reformers would have us believe. Secondly, proposed reforms always face implementation obstacles. Coase speaks to the first as follows: "The value of including…institutional factors in the corpus of mainstream economics is made clear by recent events in Eastern Europe. These ex-communist countries are advised to move to a market economy, and their leaders wish to do so, but without the appropriate institutions no market economy of any significance is possible. If we knew more about our own economy, we would be in a better position to advise them" (1992, p. 714).

Douglass North agrees. Thus although "an essential part of development policy is the creation of polities that will create and enforce efficient property rights," we unfortunately "know very little about how to create such polities" (North, 1994,p. 366). Part of the analytical lapse is that we know so little about implementing reform in the face of resistance by political, bureaucratic, and economic elites that are strategically positioned to bargain for concessions. If, for example, those who enjoy privilege, by reason of a long history of events and earlier compromises, cannot be credibly compensated and are in a position to block reform, what to do? Awaiting a disciplined framework to examine the realpolitiks of reform, economic and political prescriptions that ignore pre-existing bargaining advantages suffer a severe disconnect (Kotz and Weir, 1997).

4. Conclusions

Whereas standard economic theory describes the firm as "a point or at any rate a black box," the economics of organization maintains that "firms are palpably not points.

They have internal structure. This structure arises for a reason" (Arrow, 1999, p. vii). As developed herein, the disparity between points and structures to which Arrow refers is principally explained by the fact that orthodox economic theory and the economics of organization work off of different cognitive and behavioral descriptions of human actors. Indeed, although I do not subtitle the paper "back to basics," the fundamental message is that complex economic organization is explained in large measure as a response to the problems that are posed by the basic attributes of human actors.

The key attributes of human actors to which I refer to explain the salient features of firms and markets are bounded rationality (which, however, does not preclude a capacity for foresight) and opportunism. Both attributes are distributed across the human population in variable degree. The two principal economizing moves on which I rely are specialization, as a means by which to economize on mind as a scarce resource, and governance, as a means by which to induce order, relieve conflict, and realize mutual gains. Also, the institutional environment (of both formal and informal kinds), intertemporal transformations, and the attributes of transactions provide added explanatory power. The fundamental regularities of organization have their origins, however, in economies of specialization and/or governance.

Awaiting a unified theory (Wilson, 1998), which is not yet in prospect, several research programs—partly rival, partly complementary—have resulted from efforts to describe human actors in more veridical terms.[29] The transaction cost economics response is as described herein. A second response is to replace maximizing by satisficing—where the latter entails searching for a course of action that is good enough (Simon, 1957, 1991; Cyert and March, 1963). Another response is to reformulate the utility function so as to accommodate otherwise puzzling or aberrant individual behavior (Rabin, 1990). Smith recommends moving to a systems level of analysis, by embedding choice behavior in a market (Smith, 1991). Evolutionary economics (Nelson and Winter, 1982; Witt, 1998) affords yet another. Whatever the approach, I urge that each agenda be asked to show its hand—by which I mean work up refutable implications to which the data can be applied. Both at the level of individual choice and the theory of the firm, a huge amount of variety is

rendered more understandable and a large number of refutable implications obtain by examining the unfamiliar, nonstandard, puzzling, or the otherwise aberrant behavior of individuals and of firms and markets through a transaction cost economizing lens.

Footnotes

*The author is Edgar F. Kaiser Professor of Business Administration, Professor of Economics, and Professor of Law at the University of California, Berkeley. An earlier version of this paper was given at HEC (Paris) in October 1997; a later version was given at a workshop at MIT in March 1998; and a still later version was given as a Keynote Address to the 7th Biannual Meeting of the International Joseph Schumpeter Society in Vienna Austria in June 1998.

1. According to Smith, this move from the level of the individual to the level of the system is "the most important implication of experimental economic research" (1991, p. 881). He nevertheless concedes that it would be instructive if the mechanisms through which "exchange institutions serve up decisions that are consistent (as if by magic) with predictive models of individual rationality" were better understood (Smith, 1991, p. 894).
2. Richard Pipes ascribes the undoing of socialism in the former Soviet Union to the perverse incentives for corruption and bribery: "In the Brezhnev era, even ministerial posts in some of the republics were put up for auction: successful bidders treated them as investments because these offices enabled them to dispose of state assets on the black market for private gain. Nothing functioned in Soviet society unless lubricated by graft. The whole rickety structure stayed intact thanks to the kind of mutual interdependence observed in circles of organized crime throughout the world. Blocked from normal, legitimate channels, the acquisitive spirit burrowed underground" (Pipes, 1996, p. 49). Rather than pursue economizing purposes, Soviet citizens were wholly engaged in subgoal pursuit and the dissipation of gain.
3. An earlier variant of this figure is set out in my paper, "Transaction Cost Economics and Organization Theory" (1993).
4. Indeed, game theory makes a further move. As Ken Binmore and Larry Samuelson have put it (1994, pp. 45-46):

> Orthodox economists model man as homo economicus, thereby taking for granted that economic agents are well-informed mathematical prodigies capable of costlessly performing calculations of enormous complexity at the drop of a hat. Game theorists go one better. They have invented homo ludens, who not only takes it to be common knowledge that his fellows are prodigies like himself, but continues to hold that belief whatever evidence to the contrary he may observe.

There is a case for spending more time with William Shakespeare if the attributes of human actors are to be better understood (Bloom, 1998).

5. Tjalling Koopmans's position on natural selection is very much on point (1957, pp. 140-141):

> …if [natural selection] is the basis for our belief in profit maximization, then we should postulate that basis itself and not the profit maximization it implies in certain circumstances….
>
> It would lead us to expect profit maximization to be most clearly exhibited in industries where entry is easiest and where the struggle for survival is keenest, and would present us with the further challenge to analyze what circumstances give to an industry that character.

6. Rabin subsequently observes that it is "sometimes misleading to conceptualize people as attempting to maximize a coherent, stable, and accurately perceived U(x)" (1998, p. 12). He does not, however, move beyond individual decision making/consumer behavior to consider organizational responses/governance.

7. In a different but related vein, see Dixit (1996, p. 9) for a critique of "black box" public policy analysis. Vernon Smith's earlier objection to tests of "the economic rationality of

individuals isolated from interactive experience in social and economic institutions" (1991, p.878; emphasis in original) is likewise in this spirit.

8. For example, if one robber were to be given a much more severe sentence than the other, the local Godfather would be advised of this result and would be expected to take "appropriate action" when the prisoner with the lesser sentence is released. Or possibly the two confederates could post a bond with the Godfather, authorizing payment to the prisoner who gets the greater sentence.
9. Scott Masten points out to me that the police can defeat this by arbitrarily releasing one prisoner, the implication being that he has ratted. Since the released prisoner is vulnerable to "street justice," the agreement to maintain innocence does not realize its intended purpose. If, however, the mob can recognize such a ploy if repeated, then the mob can respond by refusing to administer street justice and wait for testimony at trial instead.
10. Although one generation of workers may be caught unawares, successors will learn and this will be reflected in the contract. (Changes in labor contracting in response to takeover threats are illustrative.)
11. Rabin does make provision for context elsewhere in his survey (1998, pp. 20, 38), but no reference is made to context in relation to money illusion.
12. Differences among societies implicate the institutional environment. See Figure 1.
13. Societies differ in giving and receiving gifts. Sometimes money is given, but money gifts in identical amounts are rarely exchanged. It would be bizarre for one person to tear up a check or endorse it back to the giver to discharge a gift. Exchanging gifts at the stores from which they are purchased is sometimes done. Many will refuse to do it at all, however, and few will announce it openly.
14. They actually need to appeal to a piecewise linear variant of their simple model to accommodate the dictator game.
15. Avner Ben-Ner and Louis Putterman make a similar point in a different context: "It is unreasonable…to suppose that workers check their extended preferences at the door of the factory or office" (1997, p. 44).

16. The refusal to make insulting offers corresponds to “be nice” in making first moves, even with strangers in one-shot, sequential games. The refusal to accept insulting offers corresponds to “don’t take any guff (crap),” perhaps especially in circumstances where the Decider is at a known disadvantage. Conceivably such behavior can be shown to have evolutionary advantage, at least in some societies.

17. Consider the matter of externalities, where the question is whether to compensate for all externalities, which, taken separately, can be metered and compensation paid with net gains. An affirmative answer could be incorrect if adverse interaction effects are in prospect. Thus if my insistence on compensation for A leads you to file claims for B, C, D, which induces me to seek compensation for E and F, then the overall impact of piecemeal calculativeness could easily be negative.

18. Actually, that somewhat overstates. I have, for example, made provision for the differential trustworthiness of individuals in the management of contracts (Williamson, 1979, p. 240) and of organization (Williamson, 1984, pp. 107-109). I furthermore observed that “It is not accidental that those with few scruples predominate in some professions” (Williamson, 1985, p. 212). The possibility that economic organization is influenced by differential cognitive ability is also mentioned (Williamson, 1975, pp. 24, 27). All of this, however, is merely noted in passing.

19. The use of organization to economize on bounded rationality is responsive to Simon’s statement that “It is only because individual human beings are limited in knowledge, foresight, skill, and time that organizations are useful instruments for the achievement of human purpose” (1957, p. 199). But what are we to make of the observation that “it is only because organized groups of human beings are limited in ability to agree on goals, to communicate, and to cooperate that organizing becomes for them a ‘problem’” (Simon, 1957, p. 199)? To what do these problems of agreeing on goals, communicating, and cooperating refer?

    Many communication problems also owe their origins to bounded rationality, in response to which organization provides both an orderly communication network and a specialized vocabulary (Arrow, 1974). But disagreement on goals sounds

more like conflict, and problems of cooperation reflect failures to realize mutual gains. These are matters to which governance applies. To be sure, taking transactions out of markets and organizing them internally comes at a cost. The intended benefit of internalization is that opportunism is attenuated, whence easier agreement on goals and cooperative adaptation result.

20. Robert Michels reports that trade union delegates, in the infancy of the English labor movement, "were either appointed in rotation from among all the members, or were chosen by lot" (1966, p. 66).

21. This is different from the usual assignment problem in the partnership literature, which assumes that the more able individuals discharge all tasks more effectively. Under an equal sharing constraint, therefore, more able individuals will form peer groups with others of high ability (Farrell and Scotchmer, 1988; Sherstyuk, 1998). Such would result in a "waste" of talent in the setup that I describe.

My setup does, however, assume that, if there are T groups in the society, there are precisely T individuals at each ability level (of which there are N) or that the number of high talent individuals exceeds the requirements of the jobs.

22. It is not uncommon, for example, for chief executives in both government and business to be subject to term limits. Such limits serve as a check on oligarchy and are observed even in the face of "compelling" reasons to continue incumbents in administrative office (for example, until a crisis expires), it being the case that "continuation crises" can often be contrived.

23. Note that formal agency theory, which works off of information asymmetry but otherwise assumes that contracts are comprehensive, is disallowed by the assumption that human actors are subject to bounded rationality.

24. This is broadly in the spirit of Thomas Mayer (1960).

25. Japanese subcontracting practices may be partly explained in these terms (Williamson, 1996, pp. 319-320).

26. That is true even of the peer group ideal, although hierarchy here (and in Condition III) is satisfied by rotation.

27. Variance in cognition and, even more, in opportunism undermine the viability of the peer group mode of organization, which is best suited to a homogeneous population of workers (such as those that are associated with small religious communities, where careful screening and social conditioning are practiced).

28. Inasmuch as economics is, after all, a social science, the propensity to describe human actors in analytically tractable rather than veridical terms in the orthodox theory of the firm, where technology is virtually determinative, commonly results in a truncated understanding of the purposes served by economic organization. Thus although technology operates in the background—in that more complex technologies frequently place greater demands on the limits of mind as a scarce resource and minimum team size is influenced by economies of scale and scope as well as by technological nonseparabilities—there is no need to appeal to technology to motivate moves among the six conditions. Evidently nothing really is more fundamental to our understanding of organization "than our view of the nature of the human beings whose behavior we are studying" (Simon, 1985, p. 303).

29. Simon advocates pluralism in science, it being the case that "any direction you proceed has a very high a priori probability of being wrong; so it is good if other people are exploring in other directions—perhaps one of them will be on the right track" (1992, p. 21). I concur.

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