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Transaction Cost Economics and Economic Sociology

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Transaction Cost Economics and Agriculture: An Excursion

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This paper is an excursion into the wonderful world of transaction cost economics, with suggestive applications to agriculture. Excursion can be variously defined. Two definitions that I like the best are “a short journey for health or pleasure” and “a round trip...at reduced rates, usually with limits set on the time of departure and return.” I promise you a safe return within the allotted time. Your leadership has negotiated exceptionally good rates. You will have to be the judge of your health and pleasure. (Economics being the “dismal science”, health and pleasure is asking a lot.)

My remarks presume that all of you have heard about transaction cost economics, that many of you are familiar with its strengths and limitations, that some of you have used it in your work, and that a few have adopted it as one of the lenses to be routinely applied to problems of contract and economic organization. Notice that I say one of the lenses rather than the lens. Transaction cost economics (TCE) is not now and I do not expect it to become the all-purpose lens for studying contract and economic organization. Rather, complex phenomena are usefully examined through several lenses, of which orthodox price theory, agency theory, and TCE are three.

A third definition of excursion as a “departure from a...proper course” will appeal to those economists who regard the resource allocation paradigm as the “proper course” for economists to follow (Reder, 1999). My position is that, its great pedagogical and analytical

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strengths notwithstanding, the resource allocation paradigm also has its limitations. Rather than deny or ignore them, we are better advised to uncover them with candor and equanimity.

Of particular importance in this connection is that TCE is both a more microanalytic and more interdisciplinary project than is orthodoxy. By contrast with those who believe that to expound “the details...would serve only to obscure the basic issues” (Posner, 1972, p. 98), TCE holds that much of the relevant action resides in the details. Inasmuch, however, as the details proliferate, a focused lens is needed to know where to look and why. If any issue that arises as or can be reformulated as a contracting problem can be examined to advantage in TCE terms, and if many phenomena can be so construed, then the lens of contract, with emphasis on transaction cost economizing, will have wide application. That is my position.

TCE is also an interdisciplinary project, in that it moves beyond economics to draw on both law and organization theory. This is to be contrasted with those who regard economics as a self-contained enterprise—which view is widely held and explains why many good economists are well-trained in economics but know (and have an interest in) little else. The uncritical acceptance of the economic theory of socialism in the 1940s is illustrative. Thus although Oskar Lange conceded that bureaucracy was a greater threat to socialism than was the problem of implementing efficient resource allocation through marginal cost transfer pricing, he dispensed with the complications of bureaucracy by observing that these belonged to “the field of sociology rather than to economic theory” (1938, p. 109). Most economists continued to ignore bureaucracy for the next 50 years, when socialism collapsed under the burdens of bureaucracy. A second illustration, to which I shall return, is the propensity to interpret contract and organization in a strictly price theoretic way, which contributed to the crisis in industrial organization in the 1960s.

The paper is organized in six parts. For purposes of perspective, I begin with orthodoxy. I then turn to the challenges posed by new ideas in law, economics, and organization theory over the period 1930-1970. Transaction cost economics is then described in two parts:

conceptualization and operationalization. Some applications to agriculture are briefly discussed. Concluding remarks follow.

I. Orthodoxy

By orthodoxy I mean textbook intermediate microeconomic theory, especially the neoclassical theory of the firm. My purpose is neither to praise nor bury orthodoxy but to make three points: orthodoxy is (1) self-limiting and (2) overused; and (3) relief is in progress.

1. self-limiting

The three self-limiting features of orthodoxy to which I would call attention are (1) the limits of the neoclassical theory of the firm, (2) uncritical recourse to hyperrationality, and (3) the disconnect from the contiguous social sciences.

(a) the theory of the firm

Harold Demsetz observes and I concur that “it is a mistake to confuse the firm of [orthodox] economic theory with its real world namesake. The chief mission of neoclassical economics is to understand how the price system coordinates the use of resources, not the inner workings of real firms” (1983, p. 377). Those who wish to understand the modern corporation, including public policy pertinent thereto, frequently need to come to terms with the firm in organizational rather than merely technological terms. To be sure, the neoclassical theory of the firm as a black box, whereby inputs are transformed into outputs according to the laws of technology, has its purposes. But it is also a narrow and self-limiting construction. There is increasing agreement that the ways in which organization matter need to be uncovered and the comparative institutional ramifications worked out (Matthews, 1986; Dixit, 1996).

(b) hyperrationality

Although most economists are persuaded of the merits of studying economic phenomena in a “rational spirit” (Arrow, 1974, p. 16), that does not imply that hyperrationality everywhere applies. Rather, hyperrationality is a simplifying assumption and should be

reserved for circumstances where the requisite supporting conditions apply. Invoking the backstop assumption that economic natural selection will reliably eliminate nonmaximizing behavior is convenient and sometimes suffices. But as Tjalling Koopmans reminds us, the efficacy of natural selection varies. Specifically, we should “expect profit maximization to be most clearly exhibited in industries where entry is easiest and where the struggle for survival is keenest” (1957, p. 141). Additionally, uncritical reliance on optimization can not only lead to fanciful constructions but discourages curiosity over the interpretation of nonstandard and unfamiliar contracting practices and organizational structures. Faced, as we are, with enormous complexity and variety, we should entertain the possibility that some of what we are observing has the purpose and effect of economizing on mind as a scarce resource. That possibility is unlikely to register among those who treat hyperrationality as an all-purpose construction, irrespective of the circumstances.

(c) insularity

Another simplifying move is to treat economics and the contiguous social sciences as disjunct. Thus Paul Samuelson (1947) distinguished between economics and sociology in terms of their rationality orientations, with rationality being the domain of economics and nonrationality being the domain of sociology. James Duesenberry subsequently quipped (1960) that economics was preoccupied with how individuals made choices, whereas sociology maintained that individuals were a product of their experience and did not have any choices to make.

This disconnect has since given way as behavioral economics and institutional economics have taken shape. Old issues are being revisited and new questions are being asked as interdisciplinary social science plays out and “the black boxes get opened” (Dixit, 1999; Pinker, 2002, p. 70).

2. overuse

Whereas orthodoxy—the resource allocation paradigm, with its emphasis on prices and output, supply and demand—is well-suited to some purposes, it is poorly suited to others. Going beyond simple market exchange, what is to be made of complex contracting and hierarchical forms of organization?

Working out of the theory of the firm as production function setup, Joe Bain held that vertical integration that lacked a “physical or technical aspect” to which technological cost savings could plausibly be ascribed was presumptively anticompetitive (1968, p. 381). Nonstandard contractual practices, such as customer or territorial restrictions, that lacked a technological basis were likewise held to have monopoly purpose. The bandwagon of monopoly reasoning during the 1960s became an antitrust steam roller (Coase, 1972, p. 67):

... if an economist finds something—a business practice of one sort or another—that he does not understand, he looks for a monopoly explanation. And as in this field we are very ignorant, the number of understandable practices tends to be very large, and the reliance on a monopoly explanation, frequent.

As Justice Stewart put it in his dissenting opinion in Von's Grocery (1966), the “sole consistency that I can find in [merger] litigation under Section 7 [is that] the Government always wins.”

Government regulation was also overused in the 1960s. Such overuse was supported by the mistaken idea that every resource allocation distortion in the market could be corrected by government regulation, which was presumed to be both efficacious and benign (Krueger, 1990, p. 172; Dixit, 1996, p. 8). The need to ground public policy analysis in a comparison of feasible alternatives, all of which are flawed, government regulation included, had yet to register.

The upshot is that in both antitrust and regulatory respects, public policy toward business was careening out of control by the late 1960s. A crisis was building for which relief was wanting.

3. relief

One of the features that Thomas Kuhn associates with new a paradigm is uneasiness, even a sense of crisis, with the prevailing paradigm (1970, p. 57). But growing dissatisfaction does not suffice: you don't beat something with nothing. Awaiting a new paradigm, a science will limp along, doing the best that it can with the paradigm in place.

With the benefit of hindsight, many of the relevant pieces with which to fashion a new paradigm had been taking shape. For our purposes here, I focus on those pieces that were especially relevant to transaction cost economics.

II. New Ideas

Although TCE rests on interdisciplinary foundations, this does not require that every user of TCE become an interdisciplinary social scientist. It is nonetheless useful for all users to be mindful of where the ideas originate. TCE owes its origins to a series of good ideas—in law, economics, and organization theory— many of which were laid down during the interval 1930-1970. With the benefit of hindsight, these three fields were wrestling with overlapping issues.

1. in law

The need here was to challenge the fiction, in both law and economics, that contracts were well defined and costlessly enforced by well-informed courts. This fiction of legal centralism was disputed by Karl Llewellyn in 1931, who perceived the need to move beyond a legal rules conception of contract and introduced the idea of “contract as framework”. As Llewellyn put it, the “major importance of legal contract is to provide...a framework which never accurately reflects real working relations, but which provides a rough indication around which such relations vary, an occasional guide in cases of doubt, and a norm of ultimate appeal when

the relations cease in fact to work” (1931, pp. 736-737). This last is important, in that recourse to the courts for purposes of ultimate appeal serves to delimit threat positions. But the key idea is this: the legalistic view of contract that applies to simple transactions needs to make way for a more managerial conception of contract as complexities build up.

What Marc Galanter refers to as “private ordering” is especially pertinent. As he puts it, the “legal centralism” tradition maintains that “disputes require ‘access’ to a forum external to the original social setting of the dispute [and that] remedies will be provided as prescribed in some body of authoritative learning and dispensed by experts who operate under the auspices of the state” (Galanter, 1981, p. 1). The facts, however, disclose that in “many instances the participants can devise more satisfactory solutions to their disputes than can professionals constrained to apply general rules on the basis of limited knowledge of the dispute” (Galanter, 1981, p. 4). Accordingly, most disputes, including many that under current rules could be brought to a court, are resolved by avoidance, self-help, and the like (Galanter, 1981, p. 2).

2. in economics

The two legs of the transaction cost economics project—transactions and governance—were prefigured by John R. Commons, who had long contested the all-purpose reliance on the efficient resource allocation paradigm. But there was more than mere criticism in Commons. As against simple market exchange between “faceless buyers and sellers who meet for an instant to exchange standardized goods and services at equilibrium prices” (Ben-Porath, 1980, p. 4), Commons had an abiding interest in “going concerns” and reformulated the problem of economic organization as follows: “the ultimate unit of activity...must contain in itself the three principles of conflict, mutuality, and order. This unit is a transaction” (1932, p. 4). Not only does transaction cost economics take the transaction to be the basic unit of analysis, but governance is the means by which to infuse order, thereby to mitigate conflict and realize mutual gain.

Ronald Coase’s classic 1937 paper “On the Nature of the Firm” specifically called attention to three lapses in the orthodox theory of firm and market organization: (1) the

distribution of transactions between firm and market were taken as given, whereas these should be derived; (2) going beyond production costs, there was a need to recognize that transaction cost differences were often responsible for the choice of one mode rather than another; and (3) orthodoxy had no good answers for the puzzle of what is responsible for limits to firm size.

Coase's subsequent critique of the market failure literature in his equally famous paper on "The Problem of Social Cost" (1960) identified additional lapses of logic. Upon reformulating the tort problem (or, more generally, the externality problem) as a problem of contract, he showed that externalities vanished when the logic of zero transaction costs is pushed to completion. As Coase put it in his Nobel Prize lecture (1992, p. 717; emphasis added):

Pigou's conclusion and that of most economists using standard economic theory was...that some kind of government action (usually the imposition of taxes) was required to restrain those whose actions had harmful effects on others (often termed negative externalities). What I showed...was that in a regime of zero transaction costs, an assumption of standard economic theory, negotiations between the parties would lead to those arrangements being made which would maximize wealth and this irrespective of the initial assignment of property rights.

Kenneth Arrow's examination of "The Organization of Economic Activity: Issues Pertinent to the Choice of Market versus Nonmarket Allocation" (1969) likewise made a prominent place for transaction costs, both in general and with reference to vertical integration. The general argument is this (Arrow, 1969, p. 48; emphasis added):

I contend that market failure is a more general condition than externality; and both differ from increasing returns in a basic sense, since market failures in general and externalities in particular are relative to the mode of economic

organization, while increasing returns are essentially a technological phenomenon.

Current writing has helped to bring out the point that market failure is not absolute; it is better to consider a broader category, that of transaction costs, which in general impede and in particular cases completely block the formation of markets.... [T]ransaction costs are the costs of running the economic system.

Organizational considerations now take their place alongside of technology, which had previously been treated as determinative. Upon recognizing that organization matters, transaction cost differences, as between internal organization and market exchange (where both are now regarded as alternative modes of contracting), have obvious ramifications for vertical integration: “An incentive for vertical integration is replacement of the costs of buying and selling on the market by the costs of intrafirm transfers; the existence of vertical integration may suggest that the costs of operating competitive markets are not zero, as is usually assumed by our theoretical analysis” (Arrow, 1969, p. 48; emphasis added).

The need to place the study of positive transaction costs on to the agenda was clearly posed. That would entail more than adding a perfunctory transaction cost term to production cost or utility function expressions. If, as James Buchanan puts it, “mutuality of advantage from voluntary exchange is...the most fundamental of all understandings in economics” (2001, p. 28), then a contractual approach—more generally, a “science of exchanges” approach (Buchanan, 2001, p. 28)—to economic organization has much to recommend it.

As perceived by Buchanan, the principal needs for a science of exchange were in the field of public finance and took the form of public ordering: “Politics is a structure of complex exchange among individuals, a structure within which persons seek to secure collectively their own privately defined objectives that cannot be efficiently secured through simple market exchanges” (1987, p. 296; emphasis added). Inasmuch as the preconditions for simple market

exchange are not satisfied when problems of collective choice are posed, a new “calculus of consent,” so to speak, was needed (Buchanan and Tullock, 1962; Brennan and Buchanan, 1985). The field of public choice took shape in response to the perceived needs.

Public ordering is not, however, the only or even the predominant way of dealing with complex market exchange. On the contrary, huge numbers of private sector transactions do not qualify to be described as simple market transactions between “faceless buyers and sellers.” Given that anticompetitive interpretations for nonstandard and unfamiliar contracting practices and organizational structures are frequently bankrupt, and since mutuality of advantage is the fundamental purpose of exchange, why not interpret the governance of contractual relations as an effort to implement the Commons Triple of conflict, mutuality, and order?

Complex contracting and organization would thus be construed mainly (but not exclusively) as self-help efforts by the immediate parties to a transaction to align incentives and craft governance structures that are better attuned to their exchange needs. The study of private ordering (with reference to industrial organization and microeconomic exchanges more generally) thus takes its place along side of public ordering.

Figure 1 sets out the main distinctions. The initial divide is between the science of choice (orthodoxy) and the science of contract. The latter then divides into public (constitutional economics) and private ordering parts, where the second is split into two related branches. One branch deals with ex ante incentive alignment (mechanism design, agency theory, the formal property rights literature), often with reference to efficient risk bearing. The second features the ex post governance of contractual relations (contract implementation, with emphasis on the mitigation of contractual hazards).

3. in organization theory

Wherein do positive transaction costs arise? What added or different purposes are served upon taking a transaction out of the market and organizing it internally? Although the organization theory literature did not specifically focus on either of these issues, it was

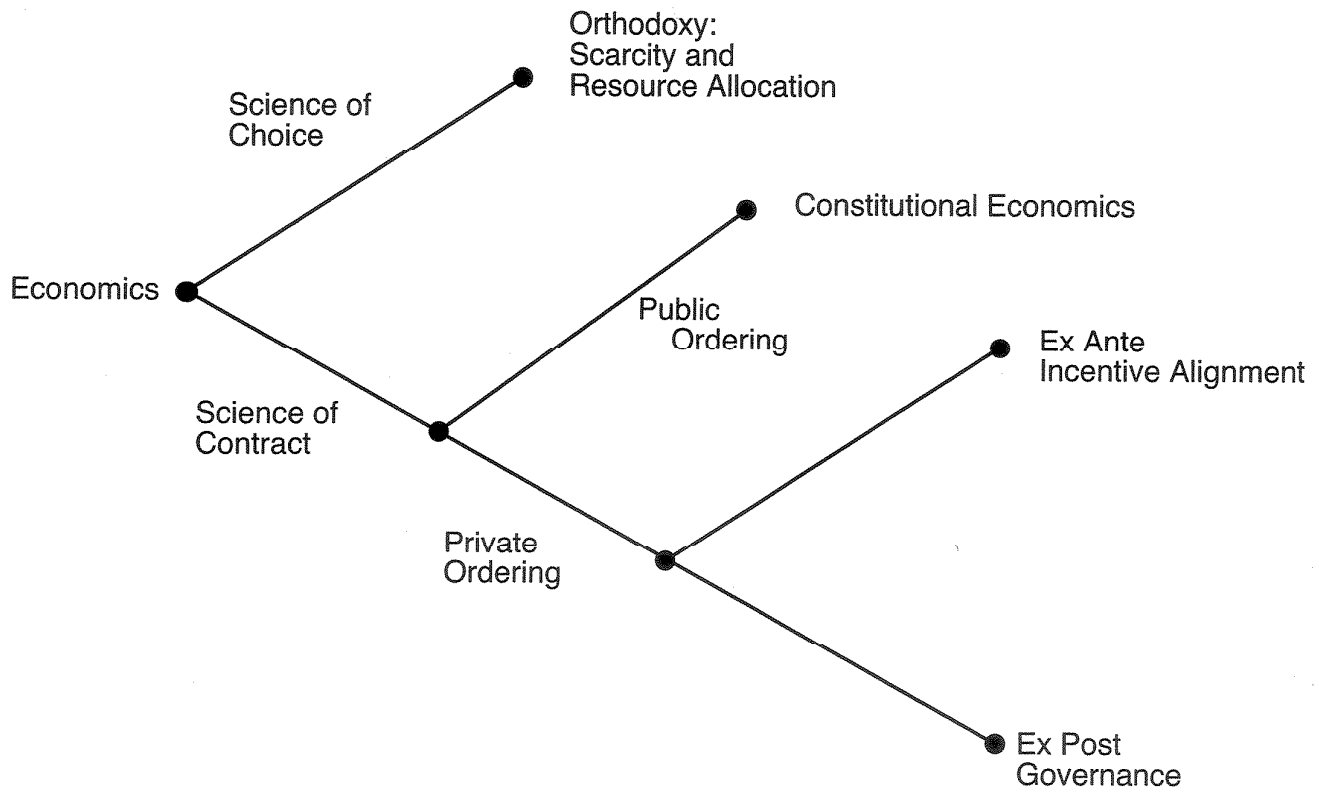


FIGURE 1
The Sciences of Choice and Contract

developing ideas that were pertinent to both. Herbert Simon's concept of bounded rationality and Chester Barnard's emphasis on cooperative adaptation were especially important.

Simon expressly took exception with the readiness with which economists invoked hyperrationality and proposed that bounded rationality—behavior that was “intendedly rational but only limitedly so” (1957, p. xxiv)—was a more veridical description. Thus although both tic-tac-toe and chess are board games, the former is a trivial game (always ends in a draw) whereas the latter is complex precisely because chess poses added demands on limited cognitive competence.

To be sure, bounded rationality is a broad concept and manifests itself in many ways. In the context of complex contracting, the fundamental problem posed by bounded rationality is that all complex contracts are unavoidably incomplete.

Additionally, organization theorists expanded our understanding of the purposes served by economic organization. Interestingly, there was agreement between the economist Friedrich Hayek and the organization theorist Chester Barnard that adaptation was the central problem of economic organization. But there were important differences as well. Hayek focused on the adaptations of economic actors who adjust spontaneously to changes in the market, mainly as signaled by changes in relative prices: Upon looking “at the price system as...a mechanism for communicating information,” the marvel of the market resides in “how little the individual participants need to know to be able to take the right action” (1945, pp. 526-527). By contrast, Barnard featured coordinated adaptation among economic actors working through administration (hierarchy). The latter is accomplished not spontaneously but in a “conscious, deliberate, purposeful” way (1938, p. 9) and comes into play when the simple market exchanges on which Hayek focused break down.

Thus whereas the adaptations to which Hayek refers are autonomous adaptations in which individual parties respond to market opportunities as signaled by changes in relative prices, the adaptations of concern to Barnard are cooperative adaptations accomplished

through administration within the firm. Because a high performance economic system will display adaptive capacities of both kinds, provision for both—whence an understanding and appreciation for both markets and hierarchies—is needed.

Table 1 sets out the main differences between TCE (lens of contract/private ordering/governance) and orthodoxy (lens of choice) that reside in the new ideas referred to above.

III. Transaction Cost Economics: Conceptualization

The growing crisis in industrial organization together with the new ideas to which I refer invited a response. Older style institutional economics had insights and ambition but failed for lack of operability. Managerial theories of the firm introduced greater realism in motivation but remained neoclassical in their production function orientation (Baumol, 1959; Marris, 1964; Williamson, 1964). Behavioral theories of the firm dealt with realism in process, but the analysis was entirely internal to the firm, hence did not address issues of comparative economic organization (Cyert and March, 1963). Incentive theories made provision for asymmetric information in the ex ante incentive alignment stage of contracting but made little or no provision for ex post maladaptation and governance responses thereto. Early efforts to implement transaction cost economics foundered on the shoals of tautology. There were simply too many degrees of freedom on which ex post rationalizations could be based (Fischer, 1977, p. 322, n. 5).

Part of the problem is that the good ideas—from law, economics, and organization sketched above—were compartmentalized: the work of Carnegie aside, each field spoke to its own rather than engage in a cross-disciplinary exchange. The real promise of interdisciplinary analysis, however, resides in “connecting or unifying” the fields (Pinker, 2002, p. 70). Additionally, and related, a contractual logic of economic organization needed to be worked up. In principle, this could be done in the abstract. Chronic complaints, however, with transaction cost reasoning were that it operated at too high a level of generality and was tautological.

Grounding TCE in the specifics of vertical integration was consequential both because logical lapses and public policy errors in prevailing lens of choice reasoning were uncovered and because vertical integration became a paradigm for breathing operational life into the TCE enterprise more generally.

Upon drawing together the good ideas referred to above, gaps in the logic would appear for which the crafting of missing pieces was needed. Among the more important missing moves were opportunism, bilateral dependency, and forbearance law. (Three other pieces that were needed to complete the logic but are passed over here are the impossibility of combining replication with selective intervention (Williamson, 1985, pp. 132-144), the welfare criterion of remediableness (Williamson, 1996, Chap. 8), and the exercise of feasible foresight.)

1. opportunism

Absent opportunism, contract as mere promise, unsupported by credible commitments, would be self-enforcing. That is because surprises that arose during contract execution, for which either no provision or incorrect provision had been made (by reason of bounded rationality), could always be worked out and mutual gains fully realized if the promises by each party to behave in a candid and cooperative way were self-enforcing (Williamson, 1985, pp. 43-67).

Perhaps because opportunism is an unflattering behavioral assumption, social scientists have been loath to introduce it. Simon, for example, eschews the strategic concept of opportunism in favor of the benign concept of “frailty of motive” (1985, p. 305). To admit to opportunism, however, does not imply that opportunism is the rule to which cooperation is the exception. On the contrary, most people will do what they say and some will do more most of the time. What opportunism has reference to is not to routines but to outliers. Strategic behavior that had been largely suppressed by economists over the interval 1870 to 1970 (Makowski and Ostroy, 2001, pp. 482-483, 490-491) makes its appearance.

Such behavior is especially relevant in the context of unanticipated disturbances to which significant maladaptations prospectively accrue. These are the outlier disturbances that pose the hazard of defection. The general argument here is that when the “lawful” gains to be had by insistence upon literal enforcement of an interfirm contract exceed the discounted value of continuing the exchange relationship, defection from the spirit of the contract can be anticipated (Williamson, 1991; Klein, 1993).

To admit to opportunism, however, is not to celebrate it. On the contrary, any cost-effective lessening of opportunism is desirable. Sometimes such lessening will occur at the societal level, where institutional differences of both formal (laws, politics, judiciaries) and informal (customs, conventions, mores) kinds inspire differential confidence among trading parties. Such societal influences are properly made part of the governance calculus. But there is more. The immediate parties to a transaction can also make private ordering efforts to mitigate opportunism by deploying governance structures appropriately. To paraphrase Robert Michels on oligarchy (1962, p. 370), nothing but a serene and frank examination of the hazards of opportunism will permit us to mitigate these hazards. The cost-effective mitigation of contractual hazards through the mechanisms of ex post governance is what TCE is all about.

2. bilateral dependency

What I have referred to as the Fundamental Transformation is a manifestation of the proposition that contract, like the law, has a life of its own. Specifically, although many transactions have large numbers of qualified suppliers at the outset, some of these are transformed into what, in effect, are small numbers supply relations during contract execution and at the contract renewal interval. The key factor here is the characteristics of the assets. Transactions that are supported by generic assets are ones for which there are large numbers of actual and potential suppliers throughout. Because such assets can be redeployed to alternative uses and users with negligible loss in productive value, each party can go its own way with little cost to the other. Where, however, significant investments in transaction specific

assets are put at risk, bilateral dependency sets in, the small numbers exchange relation referred to above takes effect, and continuity is important. It is elementary that transactions of the latter kind will pose contractual hazards if organized as simple market exchange. The need for ongoing relations in the “going concerns” to which Commons referred makes its appearance.

3. contract laws plural

TCE advances the argument that each generic mode of governance is defined, in part, by a distinctive form of contract law. As Llewellyn, Galanter, and other contract law scholars have emphasized, the concept of contract as legal rules, which applies to simple market exchange, gives way to the more elastic concept of contract as framework as contractual complexities build up. But what is the applicable law of contract for the firm?

TCE advances the argument (Williamson, 1988, 1991) that the implicit contract law for governing exchange within the firm is that of forbearance. Thus whereas courts routinely grant standing to firms engaged in interfirm exchange should there be disputes over prices, the damages to be ascribed to delays, failures of quality, and the like, courts refuse to hear disputes between one internal division and another over identical technical issues. Access to the courts being denied, hierarchy becomes its own court of ultimate appeal.

That is consequential in its own right: markets and hierarchies are discrete structural modes of governance that differ in kind rather than degree—in part because of contract law differences between them. But the proposition that hierarchy is its own court of ultimate appeal also has relevance for the Alchian and Demsetz argument that it is a delusion to claim that the firm has “the power to settle issues by fiat, by authority, or by disciplinary action superior to that available in the conventional [i.e., neoclassical] market” (1972, p. 177). Plainly, if the firm is its own court of ultimate appeal whereas the market is not, then the firm has access to fiat that the market does not. Entertaining the idea that “internal structure [of firms] must arise for some reason” (Arrow, 1999, p. vii) is plainly a productive way by which to get to the essence of economic organization.

By way of summary, the added features off of which TCE works are these: (1) it pushes beyond a benign view of self-interest (frailty of motive) to include opportunism (strategic behavior); (2) it moves beyond differential risk aversion (agency theory) to introduce the contractual hazard of bilateral dependency (by reason of asset specificity); (3) contract law (singular) is supplanted by contract laws (plural), to include forbearance law as the contract law of internal organization; (4) rather than scant bureaucracy, the intertemporal burdens of bureaucracy are featured; (5) efficiency is judged not with respect to a hypothetical ideal but in terms of the remediableness criterion; and (6) feasible foresight supplants both omniscience (orthodoxy) and myopia (behavioral economics).

IV. Transaction Cost Economics: Operationalization

As indicated, TCE is an interdisciplinary project in which law, economics, and organization are joined. Combining these ideas and adding and extending upon them leads to a very different conceptualization of the purposes served by economic organization than that afforded by orthodoxy. Many would-be theories, however, never move beyond would-be status. They founder for lack of operationalization.

1. the main case

TCE holds that economizing on transaction cost is the hitherto neglected main case. The two core constructs out of which it works are transactions and governance. Specifically, the discriminating alignment hypothesis holds that transactions, which differ in their attributes, are aligned with governance structures, which differ in their cost and competence, so as to effect a (mainly) transaction cost economizing result. Testing this hypothesis requires that the key attributes that define both transactions and governance structures be named and the ramifications worked out.

2. dimensionalizing

TCE identifies three attributes of transactions that have pervasive ramifications for governance: asset specificity (which takes a variety of forms—physical, human, site, dedicated, brand name—and is a measure of nonredeployability), the disturbances to which transactions are subject (and to which potential maladaptations accrue), and the frequency with which transactions recur (which bears both on the efficacy of reputation effects in the market and the incentive to incur the setup cost of specialized governance). The absence of asset specificity describes the ideal transaction in law and economics. Albeit important, TCE treats this not as the general but as a polar case.

Turning to governance, TCE holds that each generic mode of governance is defined by a syndrome of internally consistent attributes to which different adaptive strengths and weaknesses accrue. The three attributes of principal importance for describing governance structures are (1) incentive intensity, (2) administrative controls, and (3) contract law regime. Spot markets and hierarchy differ with respect to these attributes as follows: spot markets have stronger incentives, fewer administrative controls, and are more legalistic than hierarchies. Specifically, the high-powered incentives of markets are supplanted by lower-powered incentives when transactions are organized within firms; the spontaneous control mechanisms of spot markets (Hayek, 1945) give way to hands-on administrative involvement in firms (Barnard, 1938); and whereas the contract law of markets is legalistic and relies on court ordering, courts refuse to hear (most) internal disputes, whereupon the firm becomes its own court of ultimate appeal.

Governance, moreover, is not restricted to polar forms. All modes of organization within which (or with the support of which) transactions are managed come under scrutiny. Hybrid modes of contracting to which credible commitment supports have been crafted (penalties against premature termination are introduced and specialized information disclosure and

dispute settlement mechanisms are devised) are especially important. Table 2 summarizes the key attributes of (spot) markets, hybrids, and hierarchies.

3. heuristic models/refutable implications

Although TCE aspires to achieve full formalism, the formalization of incomplete contracts turns out to be very difficult. Awaiting further developments, semi-formal (often reduced form) models will remain the principal means by which to work out the ramifications of discriminating alignment.

Both cost and price interpretations of efficient alignment are sketched here. The cost rendition of efficient governance focuses on how the costs of governance increase as complexity (of an asset specificity kind) builds up. It will be convenient to focus on three modes: spot markets, hybrid modes of contracting into which contractual safeguards have been introduced, and hierarchies. The basic arguments are: (1) markets are well-suited to making autonomous adaptations, firms enjoy the advantage for cooperative adaptation purposes, and hybrids are located in between; (2) the needs for adaptation vary with the attributes of transactions; and (3) bureaucratic cost burdens increase as transactions move from market, to hybrid, to hierarchy.

In a heuristic way, the transaction cost consequences of organizing transactions in markets (M), hybrids (X), and hierarchies (H) as a function of asset specificity (k) are shown in Figure 2. As shown, the bureaucratic burdens of hierarchy place it at an initial disadvantage ($k=0$), but the cost differences between $M(k)$ and $H(k)$ narrow as asset specificity builds up and eventually reverse as the need for cooperative adaptation becomes especially great ($k \gg 0$). As indicated, moreover, the hybrid mode of organization $X(k)$, is viewed as a market-preserving credible contracting mode that possesses adaptive attributes located between classical markets and hierarchies. Incentive intensity and administrative control take on intermediate values and Llewellyn's (1931) concept of contract as framework applies. As shown in Figure 2, the intercepts $M(0) < X(0) < H(0)$ (by reason of bureaucratic cost differences) while the slopes

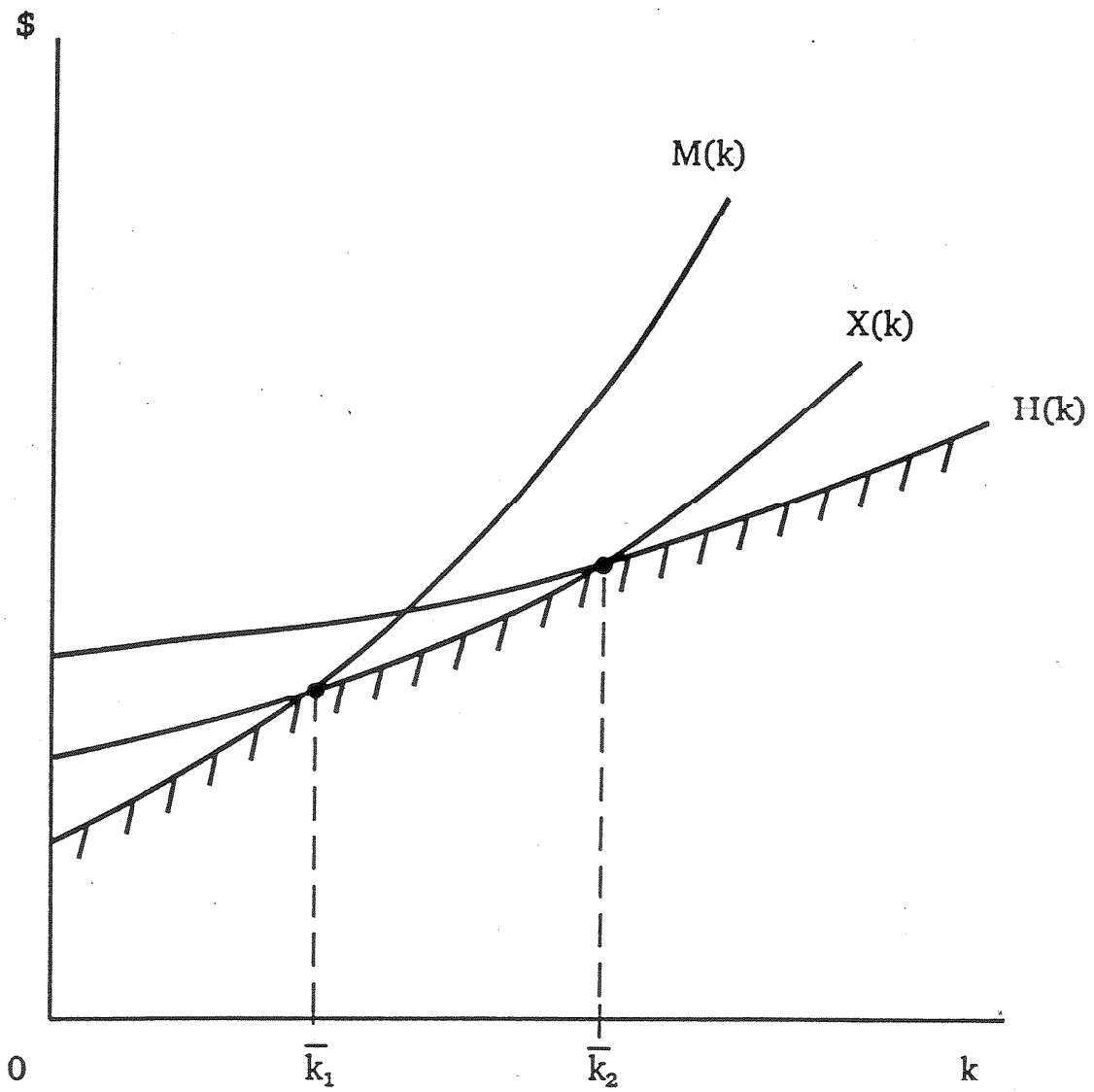


Figure 2

Transaction Costs and Asset Specificity

$M' > X' > H'$ (which reflects the differential ability of these three models to implement coordinated adaptation, the needs for which increase as asset specificity builds up). The least cost mode of governance is thus the market for $k < \bar{k}_1$, the hybrid for $\bar{k}_1 < k < \bar{k}_2$, and hierarchy for $k > \bar{k}_2$.

The simple contracting schema shown in Figure 3 provides a price interpretation of efficient governance. For purposes of simplicity, the supply side of the market is assumed to be competitively organized, whence the implicit price at each node reflects an expected break-even condition (to include a fair rate of return on investment).

Assume that a buyer can either make a component or procure it in the market. Assume also that the component can be produced by either a general purpose technology or a special purpose technology. Again, let k be a measure of asset specificity. The transactions in Figure 3 that use the general purpose technology are ones for which $k = 0$. In this case, no specific assets are involved and the parties are essentially faceless. Those transactions that use the special purpose technology are ones for which $k > 0$. Such bilaterally dependent parties have incentives to promote continuity and safeguard their specific investments. Let s denote the magnitude of any such safeguards, which include penalties, information disclosure and verification procedures, and specialized dispute resolution (such as arbitration). Unified ownership (vertical integration of successive stages) appears as the limits of interfirm credible contracting become severe. An $s = 0$ condition is one for which no safeguards are provided; a decision to provide safeguards is reflected by $s > 0$.

Node A in Figure 3 corresponds to the ideal transaction in law and economics. There being an absence of dependency, order is accomplished through simple market exchange to which competition continuously applies. This is a generic good or service for which $p = p_1$ and disputes are settled in court. Node B poses unrelieved contractual hazards, in that specialized investments are exposed ($k > 0$) for which no safeguards ($s = 0$) have been provided. Such hazards will be recognized by farsighted players, who will price out the implied risks of contractual breakdown. The break-even price at node B is \bar{p} .

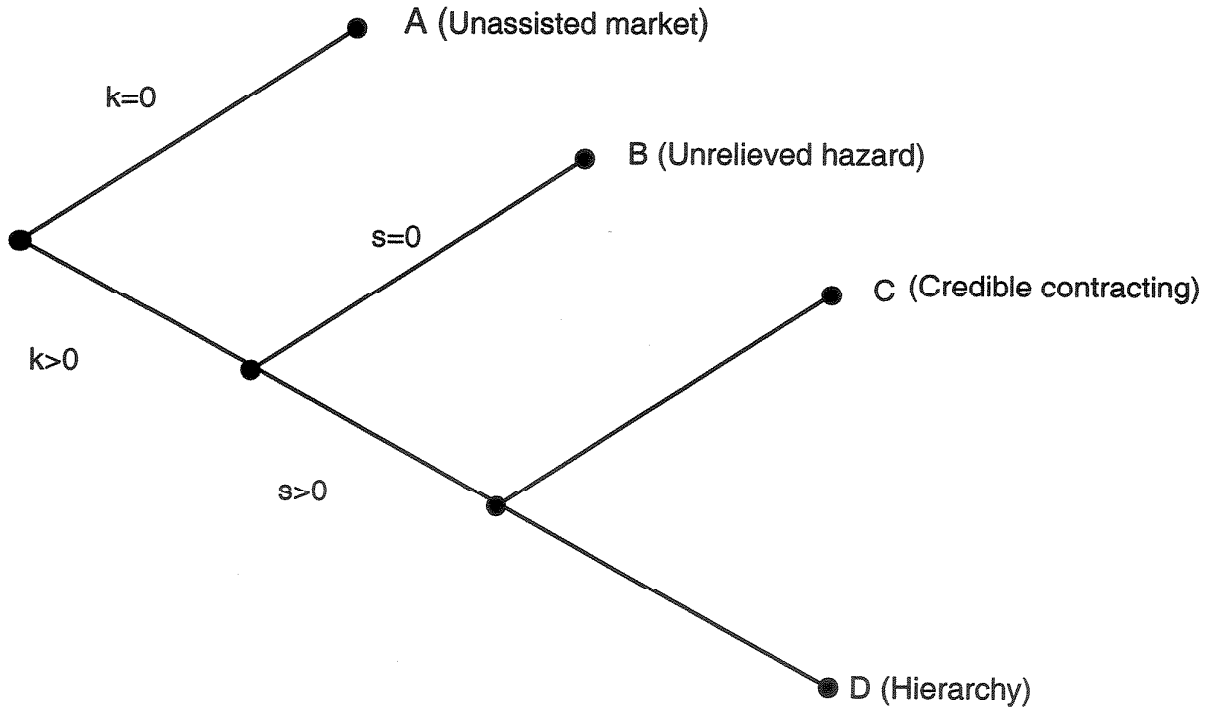


FIGURE 3 Simple Contracting Schema

Added contractual supports ($s > 0$) are provided at nodes C and D. At node C, these contractual supports take the form of the aforementioned credible contracting safeguards. In consideration of the added security that results from such safeguards, the break-even price at node C will be lower than at node B ($\hat{p} < \bar{p}$).

Finally, should costly contractual breakdowns continue in the face of best bilateral efforts to craft safeguards at node C, the transaction may be taken out of the market and organized under unified ownership (vertical integration) instead. Because added bureaucratic costs accrue upon taking a transaction out of the market and organizing it internally, internal organization is usefully thought of as the organization form of last resort: try markets, try hybrids, and have recourse to the firm only when all else fails. Node D, the unified firm, thus comes in only as higher degrees of asset specificity and added uncertainty pose greater needs for coordinated adaptation. Because of the cost differences between hybrid and hierarchy shown in Figure 2 at high levels of k , the implied full cost transfer price at node D (\tilde{p}) is less than the corresponding break-even price at node C.

(Figures 2 and 3 can be given a somewhat more rigorous interpretation by recasting the issues in stochastic terms in which credible contracting is featured (Williamson, 1983, 1991). Suffice it to observe here that the basic arguments (with added nuances) survive.)

4. Empirical Testing

As I have stated elsewhere and repeat here, transaction cost economics is an empirical success story. A number of instructive surveys have been prepared, the most recent of which is by Christopher Boerner and Jeffrey Macher (2001), which discusses over 600 empirical TCE papers (including applications to agriculture) and includes references to earlier surveys. From early and tentative beginnings in the 1980s, the growth of empirical work in TCE has been exponential.

This growth is especially noteworthy when TCE is compared with other economic theories of contract and organization, where empirical testing is the exception rather than the

rule. Partly that is because empirical testing of would-be theories is always demanding. And partly it is because it is demoralizing to discover that predicted effects are weak, of second order importance, or are contradicted by the data.

To be sure, TCE also requires more and better empirical testing. Paul Joskow's remarks are nonetheless noteworthy: empirical work in TCE "is in much better shape than much of the empirical work in industrial organization generally" (1991, p. 81).

V. Applications to Agriculture

It is no accident that many of the illustrations of variable proportions production technologies come from agriculture. Important and instructive as these resource allocation applications have been, agriculture also poses contractual and organizational problems for which the lens of contract/private ordering can be brought to bear. I am not the first to recognize this, nor am I the best qualified to speak to the applications.

Lens of contract applications of two kinds have been made: ex ante incentive alignment (mainly agency theory) and ex post governance (mainly transaction cost economics). An obvious question, from an ex ante incentive alignment perspective, is how to accomplish efficient risk bearing in the rental of farmland. Although Douglas Allen and Dean Lueck's empirical investigation of farmland sharecropping contracts discloses that the predictions of agency theory are not borne out by the data (1999), their failure to correct for endogenous matching may explain the results (Akerberg and Botticini, 2002).

Empirical applications of TCE to agriculture generally fare well, although the number of such studies in the survey by Boerner and Macher (2001) are few (fifteen). Be that as it may, the empirical research to date is broadly corroborative.

That there are not more such studies may be because the application opportunities are limited, but Scott Masten, in his paper on "Transaction Cost Economics and the Organization of Agricultural Transactions" (2000), concludes that "agricultural transactions provide a rich and largely unexplored area for application and refinement of transaction-cost theory" (2000, p. 190).

Note Masten's reference to refinements as well as applications. As I remarked earlier, TCE is an unfinished enterprise. Agricultural economists are invited not merely to use it—try it; you'll like it—but also to contribute to the development of TCE. Both novel modes of governance as well as new contractual hazards need to be addressed.

Masten observes with reference to the latter that “the most conspicuous attribute distinguishing agricultural goods from other commodities is their perishability” (2000, p. 187). Whether it qualifies as “most conspicuous” or not, perishability poses contractual hazards for which comparative contractual reasoning is sorely needed.

The hazard posed by perishability seems to be obvious: given that timing is of the essence (Masten, 2000, p. 187), producers of perishable fruits, vegetables, dairy products, seafood and the like are vulnerable to opportunistic processors. By defecting from the spirit of the contract (possibly by feigning obstacles to timely responsiveness), the latter can gain a bargaining advantage, thereby to renegotiate the contract.

This seems to be a straightforward application of transaction cost reasoning from manufacturing to agriculture. In fact, however, there are consequential differences, the most important being (1) the logic of “outliers” does not really carry over to agriculture and (2) the appearance of a new organizational form, namely, the cooperative.

1. outliers

The principal maladaptation problem to which TCE refers in manufacturing arises not with reference to routine disturbances but to outliers, in that the normal presumption of interfirm cooperation in pursuit of mutual gain is placed in jeopardy when the stakes are great. In agriculture, however, perishability is not properly described as an outlier. It is a recurrent, foreseeable hazard that appears with every harvest. To be sure, the timing varies, but the need for real time cooperation when the crop is ready for processing is apparent to the parties *ex ante*.

So the puzzle is why should a recurrent, foreseeable hazard experience opportunism. Given that the parties will meet in the marketplace as successive crops are harvested, producers will presumably price out the hazard (treat it as a node B transaction) if processors behave opportunistically. In that event, processors who recognize that reputation effects will catch up with them (Kreps, 1990) will forego the opportunity to take advantage (end games aside). If, moreover, unilateral restraint does not suffice, why don't appropriate bilateral mechanisms appear? Credible contracting mechanisms would then serve as a check on costly deceits, whereupon mutual gains would accrue.

One possibility is that entry is easy and new entrants are naïve. Not only do they fail to learn from the experience of others (in the mistaken belief that they are more clever, hence less vulnerable), but they misinterpret the high price (due to the hazard premium) as an invitation to enter. In that event, processors continuously thrive on the mistaken beliefs of a succession of naïve producers. If, however, the setup costs for many perishable crops are great and if farmers are hard-headed rather than naïve, then such an explanation strains credulity. Something else must be at work.

A second explanation is that the efficacy of reputation effects is undermined not by naivete but by skepticism. If producers view processors with suspicion and cannot verify processor claims that they really have made best efforts to respond to exigencies (the relevant information cannot be costlessly and persuasively disclosed), then adverse outcomes are interpreted as bad behavior. Since everyone knows that "big guys always push little guys around," bad behavior is what our intuitions would have told us from the outset.

Here as elsewhere, however, our intuitions can be mistaken. Especially if we are accustomed to thinking in terms of one-shot rather than recurrent contracting, the conventional wisdom can be faulty. Consider, for example, the logic (Williamson, 1985, pp. 35-38) and evidence (Fishback, 1992) on "company towns." This deals with recurrent contracting between a big guy (the company) and a collection of little guys (the workers) to which the logic of credible

contracting applies and, moreover, seems to be borne out by the data. So the question is this: Is the company town logic and evidence apropos to agriculture? The research challenge for agricultural economics is to work out the logic and evidence on recurrent contracts for perishable crops. If there are breakdowns, where do they reside?

2. cooperatives

Because backward integration from processors into farming would have detrimental effects on the incentives of farmers and pose added control costs (Williamson, 1985, Chap. 6), and because forward integration out of farms into processing is often impracticable (because individual farms are small in relation to the minimum efficient scale for a processor; and horizontal integration among farms, thereby to reach the requisite scale, poses problems of its own), vertical integration is a deeply problematic answer to the real or imagined hazards of perishability. What to do?

Collective organization (which falls short of unified ownership and thus preserves the individual ownership and operation of farms) has obvious attractions in such circumstances. Such collective organizations could take the form of bargaining cooperatives or could entail forward integration from production into processing and distribution. Knoeber describes the bargaining cooperative as follows (1983, p. 339):

Bargaining cooperatives do not generally handle growers' crops, provide processing service, or sell farm supplies. Their only function is to contract with processors for the sale of members' crops. Membership is voluntary and no control is exercised over the quantity of produce grown by their members....

Besides the market for processing fruits and vegetables, [bargaining cooperatives] are important only in the markets for milk to creameries and sugar beets to refiners (also perishable products).

Bargaining cooperatives also, however, experience problems of their own. Not only may individual members subvert the bargain, but processor compliance is also suspect (Knoeber,

1983, pp. 339-341). A more ambitious form of cooperative is for the collection of growers to own the processing (and, possibly, distribution) stages.

Michael Cook distinguishes between cooperatives that have been organized for resource allocation purposes (to manage excess supply induced prices) and those that have contractual purposes (to deal with perceived market failures). Whereas the former are short-lived, the latter have done better (Cook, 1995, p. 1156). Cook also advises that the latter are usefully examined from a TCE perspective (1995, pp. 1158-1159) and calls for more concerted work of this kind.

TCE being a relentlessly comparative exercise, comparisons of the governance of cooperatives with capitalist firms, to include an examination of ownership, oversight, contract law, and democratic decision making differences, are pertinent. One ownership difference is that the members of the cooperative have both a direct stake in the performance and more nuanced knowledge of the circumstances of the cooperative than is the case for the diffuse and disengaged owners of the capitalist firm. Because, however, there is no market for shares in the cooperative except as these are acquired through the purchase of a farm, whereas there is a market for shares in the capitalist firm, the cooperative is less subject to the discipline of competition in the capital market.

The more democratic nature of decision making in the cooperative presents the need to examine how the formal and informal rules of collective decision making influence leadership, control, real time responsiveness, executive compensation, and career rewards for executives. Also, what is the implicit contract law for cooperatives? These and other comparisons are beyond the scope of my knowledge but are very much in the spirit of TCE. More generally, Masten's view that agricultural economics poses novel and important challenges to which the lens of contract/governance is well suited is one with which I agree. We have barely scratched the surface of interesting and important contract/governance issues in the agricultural arena.

VI. Conclusions

The excursion is completed. To those of you who remain skeptics, I say fine: TCE needs good critics. I nevertheless hope that many of you are persuaded that (1) TCE is an interdisciplinary project that draws together a series of pathbreaking contributions in law, economics, and organization theory, (2) the lens of contract approach to economic organization addresses fundamental issues of governance that are central to an understanding of complex economic organization and good public policy, (3) the action resides in the microanalytic logic and mechanisms out of which transaction cost economizing works, and (4) TCE is an unfinished project, both in general and with respect to agricultural economics in particular.

From its early beginnings in industrial organization, where vertical integration served as the paradigm problem, TCE has progressively moved out to consider contractual phenomena more generally—in labor, finance, franchise bidding for natural monopoly, public bureaus, and the like. It is always exhilarating to provide deeper explanations for puzzling phenomena, especially if the data are corroborative. I am confident that agricultural economics will not disappoint.

Table 1. The Challenge of New Ideas: From Choice to Contract		
	Orthodoxy	New Ideas
Analytical Lens	Choice	Contract
Concept Of Contract	Simple With Costless Court Ordering	Complex Contract As Framework With Private Ordering
Efficiency Focus	Resource Allocation	Mutual Gain
Transaction Cost	Zero	Positive And Variable
Unit Of Analysis	Composite (Goods And Services)	Microanalytic (Separable Transactions)
Cognition	Omniscience	Bounded Rationality (Incomplete Contracting)
Adaptation	Autonomous (Market)	Coordinated (Hierarchy)

Table 2: Attributes of Leading Generic Modes of Governance

Governance Attributes	Governance Modes		
	Market	Hybrid	Hierarchy
Incentives	High-Powered	Less High-Powered	Low-Powered
Administrative Support By Bureaucracy	Nil	Some	Much
Contract Law Regime	Legalistic	Contract As Framework	Firm As Own Court Of Ultimate Appeal (Fiat)

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