

3. Transaction Cost Economics

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Transaction cost economics is an effort to better understand complex economic organization by selectively joining law, economics, and organization theory. As against neoclassical economics, which is predominantly concerned with price and output, relies extensively on marginal analysis, and describes the firm as a production function (which is a technological construction), transaction cost economics (TCE) is concerned with the allocation of economic activity across alternative modes of organization (markets, firms, bureaus, etc.), employs discrete structural analysis, and describes the firm as a governance structure (which is an organizational construction). Real differences notwithstanding, orthodoxy and TCE are in many ways complements—one being more well-suited to aggregation in the context of simple market exchange, the other being more well-suited to the microanalytics of complex contracting and nonmarket organization.

I begin by contrasting the lens of contract (out of which TCE works) with the lens of choice (orthodoxy). Vertical integration, which is the paradigm problem for TCE, is then examined. The operationalization of TCE is discussed in Section 3. Variations on a theme are sketched in Section 4. Public policy is discussed in Section 5. Concluding remarks follow.

1. THE LENSES OF CHOICE AND CONTRACT¹

Big Ideas

Hal Varian has recently distinguished between important ideas and Big Ideas and describes Ronald Coase's classic paper, "The Nature of the Firm" (1937) as a Big Idea (2002, p. C2). Although there is widespread agreement on this, the nature of the big idea took a long time to register. Thus as of 1972, thirty-five years after the publication of "The Nature of the Firm," Coase described his 1937 article as "much cited and little used" (1972, p. 63). It was much cited because it was onto something important, perhaps even big. But it was little used because the big idea was only dimly perceived and/or lacked operationalization (Coase, 1992, pp. 716–718).

¹This subsection is based on Williamson (2002b).

The essence of the Coasian contribution has been variously described (Williamson, 1994, p. 202; North, 2000, p. 37; Werin, 2000, p. 45). For the purposes of TCE, I contend that the overarching big idea was to move from choice to contract: bring the lens of contract systematically to bear on economic phenomena of all kinds. For many transactions, of which the make-or-buy decision is one (Coase, 1937), the contractual structure is easily recognized. Other transactions, such as the externality problem (Coase, 1960), needed to be reformulated to bring out their latent contractual features. The object, in these and other cases described herein, is to uncover previously neglected but, often, consequential features, the discovery of which often leads to different and, sometimes, deeper understandings than the orthodox lens of choice affords. If, as James Buchanan declares, “mutuality of advantage from voluntary exchange is . . . the most fundamental of all understandings in economics” (2001, p. 29), then at least some of us should be thinking of economics as the “science of exchanges” (Buchanan, 2001, p. 28).²

The Sciences of Choice and Contract

Economics throughout the 20th century has been developed predominantly as a science of choice. As Lionel Robbins famously put it in his book, The Nature and Significance of Economic Science, “Economics is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses” (1932, p. 16). Choice has been developed in two parallel constructions: the theory of consumer behavior, in which consumers maximize utility, and the theory of the firm as a production function, in which firms maximize profit. Economists who work out of such setups emphasize how quantities are influenced by changes in relative prices and available resources, a project which became the “dominant paradigm” for economics throughout the twentieth century (Reder, 1999, p. 48).

But the science of choice is not the only lens for studying complex economic phenomena, nor is it always the most instructive lens. The other main but less fully developed approach is the science of contract. Indeed, Buchanan (1975, p. 225) avers that economics as a discipline went “wrong” in its preoccupation with the science of choice and the optimization apparatus associated therewith. What was needed was the parallel development of a science of contract. Awaiting this, some phenomena would go unnoticed, others would be poorly understood, and public policy error would result.

²Students of the history of thought will remind us that *catallactics*—meaning “the science of exchanges”—has much earlier origins. Indeed, a book by E. B. de Condillac on this subject was published in 1776, which is when The Wealth of Nations first appeared (see Murray Rothbard (1987, pp. 377–378) for an historical sketch). Recurrent interest in the science of contract notwithstanding, it has operated in the shadows of the science of choice. Why the disparity? Here as elsewhere, good ideas need to be operationalized. Contractual analysis has gotten under way in a sustained way only during the past 40 years.

As perceived by Buchanan, the principal needs for a science of contract were to 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). Thinking contractually in the public ordering domain leads into a focus on the rules of the game. Issues of a constitutional economics kind are posed (Buchanan and Tullock, 1962; Brennan and Buchanan, 1985).

Whatever the rules of the game, the lens of contract is also usefully brought to bear on the play of the game. This latter is what I refer to as private ordering, which entails 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. John R. Commons’ prescient statement on the nature of the economic problem provides the unifying theme: “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).³ 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.

Although market competition serves these governance purposes in the context of the “simple market exchanges” to which Buchanan made reference (which is wholly in the spirit of orthodox price theory), transaction cost economics is predominantly concerned with complex market exchange where there are small numbers of parties on each side of the transaction. Rather than examine such issues with the price-theoretic apparatus of oligopoly or oligopsony, transaction cost economics focuses instead on uncovering and explicating the strategic hazards that are posed by small numbers exchange in the context of incomplete contracting and the cost-effective deployment of governance to mitigate these hazards. Strategic issues that had been ignored by neoclassical economists from 1870 to 1970 now make their appearance (Makowski and Ostroy, 2001, pp. 482–483, 490–491).

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) while the second features the ex post governance of contractual

³Not everyone associated with the lens of contract would agree. Coase, for example, contends that “American institutionalism,” of which Commons was a prominent part, “is a dreary subject . . . All it had was a stance of hostility to the standard economic theory. It certainly led to nothing” (1984, pp. 229–230). My view is that Commons was ahead of his time. He had a lens of contract conception of economics as early as the 1920s.

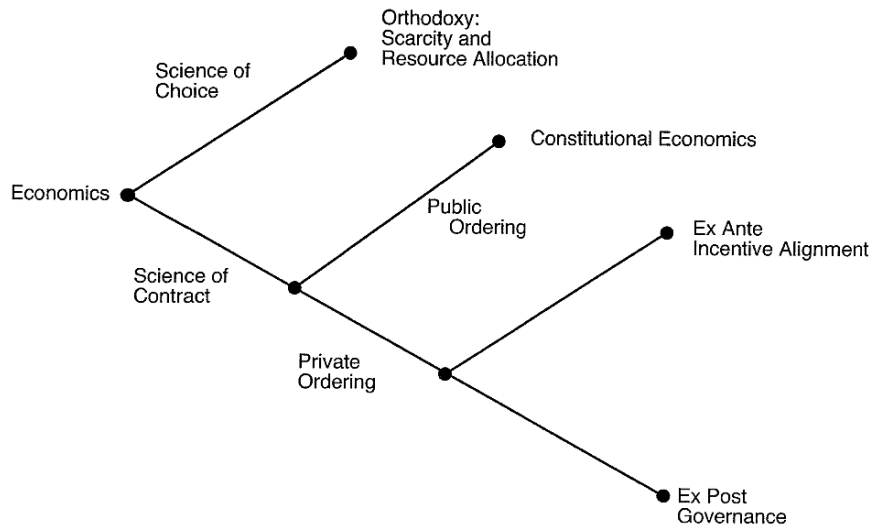


Figure 1. The sciences of choice and contract

relations (contract implementation). Albeit related, these two are in tension. Thus whereas transaction cost economics locates the main analytical action in the ex post stage of contract (where maladaptation problems appear), the formal incentive alignment literature annihilates ex post governance.⁴ One device for accomplishing this is to assume common knowledge of payoffs and costless bargaining.

The use of strong assumptions (of which common knowledge of payoffs and costless bargaining are two) to strip away inessentials and get at the essence is, to be sure, vital to the scientific enterprise. Simplifications, however, that lose contact with core issues are deeply problematic: “A model can be right in . . . [a] mechanical sense . . . [yet be] unenlightening because . . . [it is] imperfectly suited to the subject matter. It can obscure the key interactions, instead of spotlighting them” (Solow, 2001, p. 112). In the degree to which the core issues that are posed by contractual incompleteness are those of maladaptation,

⁴Contract theorists who concentrate the analytical action on the ex ante incentive alignment stage of contracting might complain that TCE makes strong assumptions also, the effect of which is to annihilate the ex ante incentive alignment stage. For example, TCE assumes that contracting parties in intermediate product markets are risk neutral, whence efficient risk bearing plays no role in incentive alignment. Contract theorists who rely on risk aversion for their main results might protest against risk neutrality.

Be that as it may, TCE also assumes that contracting parties look ahead, recognize consequential contractual hazards that arise during contract implementation, and factor these into the ex ante contractual design—by pricing out unrelieved contractual hazards and by introducing credible commitments (in cost effective degree)—so ex ante and ex post stages of contract are definitely joined. What TCE disallows are assumptions which vaporize maladaptation and strategizing during contract implementation—of which common knowledge of payoffs and costless bargaining are two.

formalizations that preserve rather than annihilate ex post governance are needed (Bajari and Tadelis, 2001).

2. THE PARADIGM PROBLEM: VERTICAL INTEGRATION

Contract is an encompassing concept. Rather than treat the issue in its full generality, it will be instructive to begin with a specific puzzle of economic organization, ideally one for which other contractual issues will turn out to be variations on a theme.

The obvious transaction with which to begin is that of vertical integration, or, in more mundane terms, the make-or-buy decision. Not only is the make-or-buy decision the transaction on which Coase focused in 1937, but it has a prior and continuing history of importance within economics. Examining the intermediate product market transactions (within and between firms) also has an advantage in that it relieves many of the asymmetry conditions—of information, budget, legal talent, risk aversion, and the like—that complicate the analysis of transactions in final product markets.⁵

Coase's classic article opens with a basic puzzle: Why does a firm emerge at all in a specialized exchange economy? If the answer resides in entrepreneurship, why is coordination "the work of the price mechanism in one case and the entrepreneur in the other" (Coase, 1937, p. 389)? Coase appealed to transaction cost economizing as the hitherto missing factor for explaining why markets were used in some cases and hierarchy in other cases and averred that "The main reason why it is profitable to establish a firm would seem to be that there is a cost of using the price mechanism, the most obvious . . . [being] that of discovering what the relevant prices are" (1937, p. 391). That sounds plausible, but is it truly comparative? How is it that internal procurement by the firm avoids the cost of price discovery?

The "obvious" answer is that sole-source internal supply avoids the need to consult the market about prices because internal accounting prices of a formulaic kind (say, of a cost-plus kind) can be used to transfer a good or service from one internal stage to another. If, however, that is the source of the advantage of internal organization over market procurement, the obvious lesson is to apply this same practice to outside procurement. The firm simply advises its purchasing office to turn a blind eye to the market by placing orders, period by period, with a qualified sole-source external supplier who agrees to sell on cost-plus terms. In

⁵Final product market transactions and transactions between suppliers and distributors need to be distinguished. The former refer to transactions between firms (as suppliers) and final consumers (buyers). Serious asymmetry conditions for which consumer protections are sometimes warranted arise for final product market transactions. By contrast, the transactions between the manufacturer and the distributor are between firms. Thus the manufacturer can sell outright to distributors (which is a market transaction). Or the manufacturer can integrate forward into distribution (so both stages are under unified ownership/hierarchy). Or the manufacturer can create franchisees (which are a hybrid mode of contracting).

that event, firm and market are put on a parity in price discovery respects—which is to say that the price discovery burden that Coase ascribes to the market does not survive comparative institutional scrutiny.

Even, however, if price discovery did survive comparative institutional scrutiny, that seems to be a thin basis upon which to rest the case for using firms rather than markets if, as I contend, firm and market differ in kind rather than in degree. What economic purposes are served by the discrete structural changes that distinguish market and hierarchy? Does the move from choice (where prices are focal) to contract implicate other, possibly more basic, considerations? What rudiments inform the logic of contract and comparative economic organization?

3. THE RUDIMENTS

This last invites the student of economic organization to step back and address contract “on its own terms.” What are the attributes of human actors that bear on the efficacy of contract? What unit of analysis should be employed? Of the many purposes of contract, which are salient? How are alternative modes of governance described? What refutable implications accrue upon reformulating the problem of economic organization in comparative contractual terms? Are the data corroborative? What are the public policy ramifications?

(a) *Human Actors*

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), then economists and other social scientists are well-advised to describe the key cognitive, self-interest, and other attributes of human actors on which their analyses rest. Simon’s view of cognition is that the usual hyperrationality assumption be supplanted by bounded rationality—behavior that is “intendedly rational but only limitedly so” (1957a, p. xxiv). He further recommends that self-interest be described as “frailty of motive” (1985, p. 305). TCE concurs that bounded rationality is the appropriate cognitive assumption and takes the chief lesson of bounded rationality for the study of contract to be that all complex contracts are unavoidably incomplete. But TCE also takes a further step, which takes exception with the common view that bounded rationality implies that human actors are myopic. As against myopia, human actors are assumed to have the capacity to look ahead, uncover possible contractual hazards, and work out the contractual ramifications (Shultz, 1995).

TCE also pushes beyond frailty of motive to make provision for opportunism. This latter does not deny that most people will do what they say and some will do more most of the time. Opportunism, however, has reference to exceptions—outliers where there is a lot at stake and parties are often observed to defect from the spirit of cooperation to insist on the letter of the incomplete contract. Strategic considerations are introduced upon making provision for opportunism.

(b) *Unit of Analysis*

The natural unit of analysis for lens of contract purposes is the transaction. Naming a unit of analysis is always much easier, however, than identifying the critical dimensions for describing the unit of analysis—as witness the fact that the key attributes for so many would-be units of analysis are never identified.⁶ Awaiting dimensionalization, transaction cost economics remained a largely tautological construction.

To be sure, transactions can be variously described—depending on the purpose. Transaction cost economics holds that three dimensions that have pervasive ramifications for governance are 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 cost of specialized internal governance). The absence of asset specificity describes the ideal transaction in law and economics for which competition works well: “sharp in by clear agreement; sharp out by clear performance” (Macneil, 1973, p. 734). As asset specificity builds up, however, bilateral dependency develops and, in combination with uncertainty (which pushes incomplete contracts out of alignment), the aforementioned contractual complications set in.

(c) *Main Purpose*

Interestingly, both the economist Friedrich Hayek (1945) and the organization theorist Chester Barnard (1938) were in agreement that adaptation is the central problem of economic organization. Hayek (pp. 526–527) 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.” 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 (p. 9) and comes into play when the simple market exchanges on which Hayek focused break down.

In effect, the adaptations to which Hayek refers are autonomous adaptations in which individual parties respond to market opportunities as signaled by changes in relative prices whereas the adaptations of concern to Barnard are cooperative adaptations accomplished through administration within the firm.

⁶Examples of would-be units of analysis for which operational content is missing include the role (see Simon’s critique (1957a, p. xxx), the decision-premise (which is Simon’s candidate, but which has found little application outside of cognitive psychology (Newell and Simon, 1972)), and the routine (Nelson and Winter, 1982). The next two paragraphs and Section 4 are based on Williamson (2002a).

Because a high performance economic system will display adaptive capacities of both kinds, an understanding and appreciation for both markets and hierarchies (rather than the comparative economic systems dichotomy between markets or hierarchies) is needed. The firm for these purposes is described not as a production function (which is a technological construction) but as a governance structure (which is an organizational construction). And the market is described similarly. The lens of contract, as against the lens of choice, is made the cutting edge.

One of the advantages of focusing on adaptation as the main case is that it brings added meaning to the idea of mutual gain. It is elementary that gains from trade will always be realized by moving onto the contract curve. But how is this to be accomplished in a world where complex contracts are incomplete and are implemented over time in the face of disturbances for which contingent provisions either have not been made or, if made, are often in error? Crafting governance structures that are attuned to the hazards and help the parties to restore efficiency (return to the shifting contract curve) where otherwise a costly impasse would develop is needed in these circumstances. More attention to designing processes that have good adaptive properties (and less to concentrating all of the action in the ex ante incentive alignment stage) is thus one of the central lessons of TCE.

(d) Governance Structures

Examining economic organization through the lens of contract both places the spotlight on ex post adaptation and, in the process, gives prominence to the role of governance. Specifically, 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: the high-powered incentives of markets are supplanted by low-powered incentives when transactions are organized within firms; market exchange is a hands-off control mechanism whereas hierarchy involves considerable hands-on administrative involvement; and whereas disputes in markets are treated in a legalistic way and rely on court ordering, courts refuse to hear (most) internal disputes, whereupon the firm becomes its own court of ultimate appeal. Firms have access to fiat that markets do not because of these dispute resolution differences.⁷

Governance, moreover, is an encompassing concept. Going beyond polar forms, all modes of organization within which (or with the support of which)

⁷One of the reasons why markets lack fiat is that attempts to award decision rights to autonomous agents by contract (e.g., A will decide disputed matters of type X; B will decide disputed matters of type Y; etc.) are commonly unenforceable. That is because one of the parties to a market contract can invoke (invent) a "technicality," the effect of which is to bring the dispute before the courts.

Table 1. Attributes of leading generic modes of governance

	Governance Modes		
Governance Attributes	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)

transactions are managed come under scrutiny. Hybrid modes of contracting to which credible commitment supports have been crafted (penalties against premature termination, specialized dispute settlement mechanisms and the like) are especially important. Table 1 summarizes the key attributes of (spot) market, hybrids, and hierarchies. As developed in the text accompanying Figures 2 and 3 below, the clusters of attributes that define these three alternative modes of

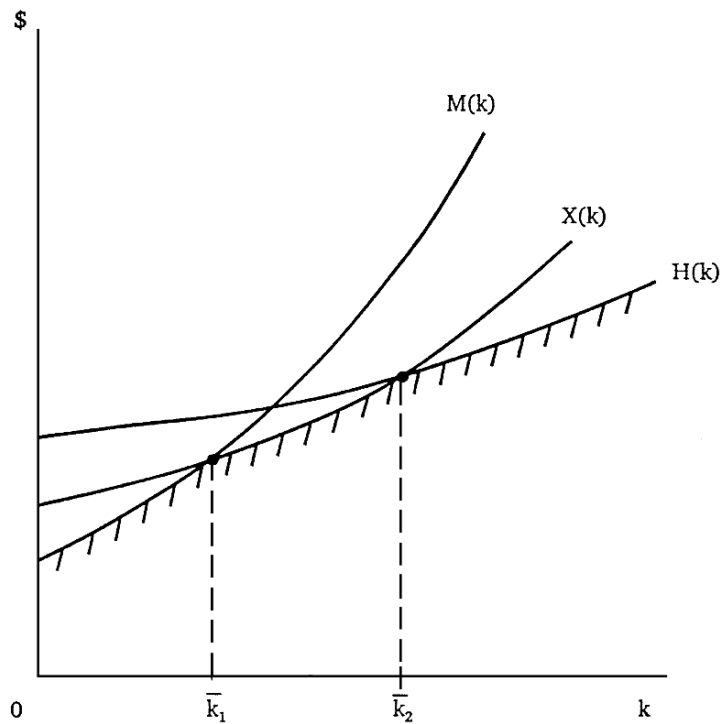


Figure 2. Transaction costs and asset specificity

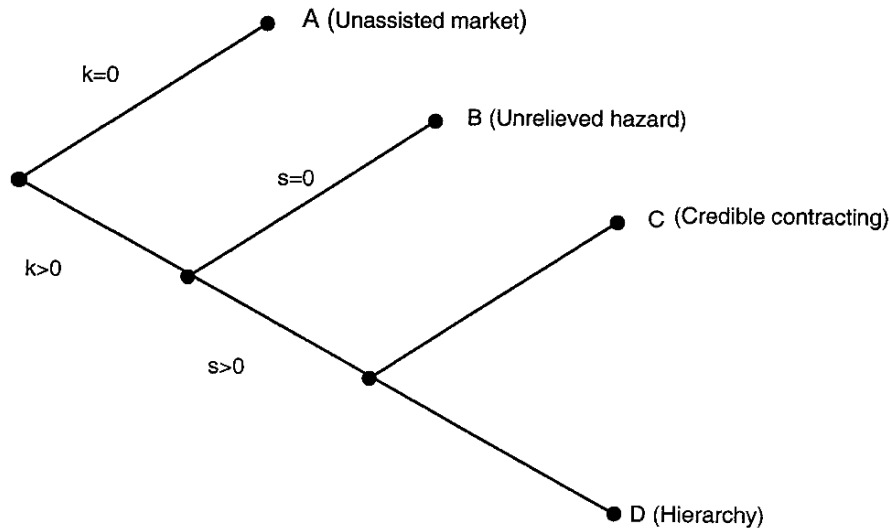


Figure 3. Simple contracting schema

governance give rise to differential transaction costs among modes, conditional on the attributes of the transactions to be organized.

An unremarked governance complication also needs to be introduced. This is that organization, like the law, has a life of its own (Selznick, 1950, p. 10). Issues of internal organization that have been featured by organization theorists (Barnard, 1938; Simon, 1947; March and Simon, 1958) and by sociologists (Michels, 1912; Merton, 1936; Selznick, 1949; Scott, 1992) thus arise. Note in this connection that while it is relatively easy to show that internal organization is subject to incentive limits and bureaucratic distortions, it is much more difficult to show that *comparative* cost consequences accrue upon taking a transaction out of the market and organizing it internally (Williamson, 1985, Chap. 6). That is because the goods and services traded in a market are produced within firms. The question of make-or-buy is thus whether the costs (including bureaucratic costs) are greater in two autonomous firms than in one combined entity.

TCE uncovers and explicates the incentive and bureaucratic cost consequences that attend the move from market to hierarchy by postulating two processes: replication and selective intervention. Were it that the firm could replicate the market in all circumstances where market procurement works well and intervene selectively (if expected net gains can be projected) where markets break down, then the firm could never do worse than the market (through replication) and would sometimes do better (through selective intervention). As it turns out, it is impossible to realize this ambition. Incentives are unavoidably

compromised⁸ and added bureaucratic costs are unavoidably incurred upon taking a transaction out of the market and organizing it internally. The upshot is that the move from market to hierarchy is attended by tradeoffs. Discriminating alignment is thus needed.

(e) *Predictions and Empirical Testing*

The main engine from which the predictions of TCE are derived is that of discriminating alignment, according to which transactions, which differ in their attributes, are aligned with governance structures, which differ in their cost and (adaptive) competence, so as to effect a transaction cost economizing result. The upshot is that there is a place for each generic mode of governance, yet each should be kept in its place. The TCE answer to the Coasian puzzle of which transactions go where and why resides precisely in discriminating alignment, the efficacy of which relies in part on weak-form natural selection (Simon, 1983, p. 69) to penalize errors of inefficient alignment.

It will be convenient here to focus on three modes: spot markets (M), hybrid modes of contracting (X), into which credible commitments have been introduced, and hierarchies (H). The basic argument is that (1) markets are well-suited to making autonomous adaptations, firms enjoy the advantage for comparative adaptation purposes, and hybrids are located in between, (2) the needs for adaptation vary among transactions (especially with reference to asset specificity), 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) 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 thus take on intermediate values and Karl Llewellyn's (1931) concept of contract

⁸The issues here are rather involved. The interested reader is referred to Williamson (1985, Chap. 6) for a discussion. Briefly the argument is that (1) replication is essential if parity between firm and market is to be assumed, (2) such replication implies that incentives are unchanged in each of the separable stages upon taking a transaction out of the market and organizing it internally, yet (3) unchanged incentive intensity cannot be accomplished if the acquiring stage exercises control over the accounting system (to include transfer prices, overhead rates, depreciation, and the like) and cannot credibly commit to behaving nonstrategically, to include intervening always but only for good cause (selective intervention).

But there is more. Not only is incentive intensity unavoidably weakened when transactions move from market to hierarchy, but cooperative adaptation across successive stages is promoted by intentionally weakening incentive intensity within the firm.

as framework applies. As shown in Figure 2, $M(0) < X(0) < H(0)$ (by reason of bureaucratic cost differences) while $M' > X' > H'$ (which reflects the differential ability of these three modes to implement coordinated adaptation, the needs for which increase as asset specificity builds up).⁹ 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 $k > \bar{k}_2$.

Whereas many theories of vertical integration do not invite empirical testing, the transaction cost theory of vertical integration invites and has been the subject of considerable empirical analysis. Both the theory of the firm (Holmstrom and Tirole, 1989, p. 126) and the field of industrial organization (Peltzman, 1991) have been criticized for lack of empirical testing; yet empirical research in transaction cost economics has grown exponentially during the past 20 years. (For surveys, see Shelanski and Klein (1995), Lyons (1996), Crocker and Masten (1996), Rindfleisch and Heide (1997), Masten and Saussier (2000) and Boerner and Macher (2001).) Added to this are numerous applications to public policy, especially antitrust and regulation, but also to economics more generally (Dixit, 1996) and to the contiguous social sciences (especially political science). The upshot is that the theory of the firm as governance structure has become a “much used” construction.¹⁰

4. VARIATIONS ON A THEME

Vertical integration turns out to be a paradigm. Thus although many of the empirical tests and public policy applications have reference to the make-or-buy decision and vertical market restrictions, this same conceptual framework has application to contracting more generally. Specifically, the contractual relation between the firm and its “stakeholders”—customers, suppliers, and workers along with financial investors—turn out to be variations on the theme set out in the simple contractual schema.

⁹ M' , X' , and H' refer to the marginal costs of market, hybrid, and hierarchical governance with respect to changes in asset specificity (k).

¹⁰Reprints of leading articles on vertical integration (by Benjamin Klein on Fisher Body-GM (1988), Paul Joskow on long-term coal contracting (1988), Kirk Monteverde and David Teece on automobile integration (1982), Scott Masten on aerospace production (1984), Erin Anderson and David Schmittlein on sales force organization (1984), George John and Barton Weitz on forward integration into distribution (1988), and Scott Masten, James Meehan, and Edward Snyder on the cost of organization (1991)) can be found in Williamson and Masten, Vol. II (1995).

This same volume includes empirical contracting articles (by Thomas Palay on rail freight contracting (1984), Victor Goldberg and John Erickson on long term petroleum coke contracts (1987), Paul Joskow on contract duration (1987), Harold Mulherin on natural gas contracting (1986), Scott Masten and Keith Crocker on take-or-pay provisions (1985), Keith Leffler and Randal Rucker on timber (1991), and Keith Crocker and Scott Masten on the long term contracting process (1991).

Empirical studies of regulation and positive political economy include Oliver Williamson (1976), Victor Goldberg (1976), George Priest (1993), Brian Levy and Pablo Spiller (1994), Barry Weingast and William Marshall (1988), and Rafael Gely and Pablo Spiller (1990). Antitrust applications include Oliver Williamson (1979), Roy Kenney and Benjamin Klein (1983), and Scott Masten and Edward Snyder (1993).

The Simple Contractual Schema

Assume that a firm can make or buy a component and assume further that the component can be supplied 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 $k > 0$. As earlier discussed, 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, specialized dispute resolution (such as arbitration) and, in the limit, integration of the two stages under unified ownership. An $s = 0$ condition is one for which no safeguards are provided; a decision to provide safeguards is reflected by an $s > 0$ result.

Node A in Figure 3 corresponds to the ideal transaction in law and economics: there being an absence of dependency, governance is accomplished through competitive market prices and, in the event of disputes, by court awarded damages. 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.

Added contractual supports ($s > 0$) are provided at nodes C and D. At node C, these contractual supports take the form of interfirm contractual safeguards. Should, however, 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 cooperative adaptation.

Note that the price that a supplier will bid to supply under node C conditions will be less than the price that will be bid at node B. That is because the added security features serve to reduce the risk at node C, as compared with node B, so the contractual hazard premium will be reduced. One implication is that suppliers do not need to petition buyers to provide safeguards. Because buyers will receive product on better terms (lower price) when added security is provided, buyers have the incentive to offer cost-effective credible commitments. Also note that whereas such commitments are sometimes thought of as a user-friendly way to contract, the analytical action resides in the hard-headed use of credibility to support those transactions where asset specificity and contractual hazards are at issue. Such supports are without purpose for transactions where generic technologies are employed.

The foregoing schema can be applied to virtually all transactions for which the firm is in a position to own as well as to contract with an adjacent stage—backward into raw materials, laterally into components, forward into distribution. But for some activities, ownership is either impossible or very rare.¹¹ For example, firms cannot own their workers or their final customers (although worker cooperatives and consumer cooperatives can be thought of in ownership terms). Also, firms rarely own their suppliers of finance. Node D drops out of the schema in cases where ownership is either prohibited by law or is otherwise rare. I begin with forward integration into distribution, after which relationships with other stakeholders of the firm, including labor, finance, and public utility regulation are successively considered.¹²

Applications

(a) Forward Integration into Distribution

I will set aside the case where mass marketers integrate backward into manufacturing and focus on forward integration into distribution by manufacturers of products or owners of brands. Specifically, consider the contractual relation between a manufacturer and large numbers of wholesalers and, especially, of retailers for the good or service in question.

Many such transactions are of a generic kind. Although branded goods and services are more specific, some require only shelf space, since advertising, promotion and any warranties are done by the manufacturer. Since the obvious way to trade with intermediaries for such transactions is through the market, in a node A fashion, what is to be inferred when such transactions are made subject to vertical market restrictions—such as customer and territorial restrictions, service restrictions, tied sales, and the like?

Price discrimination, to which allocative efficiency benefits were often ascribed, was the usual price theoretic (science of choice) explanation for such restrictions. Such efficiency claims, however, are problematic once the transaction costs of discovering customer valuations and deterring arbitrage are taken into account (Williamson, 1975, pp. 11–13). Not only are the benefits problematic, but price discrimination is a needlessly narrow interpretation.

¹¹ Closely complementary technologies are commonly relegated to the “core technology” (Thompson, 1967, pp. 19–23) and are effectively exempt from comparative institutional analysis, it being “obvious” that these are done within the firm.

¹² Natural monopoly and government bureaus can be interpreted in terms of the schema in Figure 3 as follows: First, given natural monopoly, the three “evils” to which Milton Friedman (1962, p. 128) referred—unregulated monopoly, regulation, and nationalization—correspond, roughly, to nodes B, C, and D, respectively. Also, for a good or service for which the government is the buyer, nodes A, B, and C are all market nodes (spot market, unrelieved hazard, and long-term (often cost-plus) contracting, respectively), while node D is the government bureau deciding to do the task itself. The government bureau has especially low-powered incentives, is highly bureaucratized (by design), and has its own dispute settlement machinery (Williamson, 1999).

Viewed through the lens of contract, vertical market restrictions often have the purpose and effect of infusing order into a transaction where the interests of the system and the interests of the parts are otherwise in conflict. For example, the Schwinn bicycle company imposed nonresale restrictions upon franchisees. The concern was that the integrity of the brand, which was a system asset, would be compromised by franchisees who perceived local opportunities to realize individual gain by selling to discounters, who would then sell a “bike in a box,” without service or support (Williamson, 1985, pp. 183–189). More generally, the argument is this: in circumstances where market power is small, where simple market exchange (at node A) would compromise the integrity of differentiated products, and where forward integration into distribution (at node D) would be especially costly, the use of vertical market restrictions to effect credible commitments (at node C) has much to recommend it.

(b) *Relationship with Labor*

Because the firm is unable to own its labor, node D is irrelevant and the comparison comes down to nodes A, B, and C. Node A corresponds to the case where labor is easily redeployed to other uses or users without loss of productive value ($k = 0$). Thus although such labor may be highly skilled (as with many professionals), the lack of firm-specificity means that, transition costs aside, neither worker nor firm has an interest in crafting penalties for unwanted quits/terminations or otherwise creating costly internal labor markets (ports of entry; promotion ladders), costly information disclosure and verification procedures, and costly firm-specific dispute settlement machinery. The mutual benefits simply do not warrant the costs.

Conditions change when $k > 0$, since workers who acquire firm-specific skills will lose value if prematurely terminated (and firms will incur added training costs if such employees quit). Here, as elsewhere, unrelieved hazards (as at node B) invite governance responses to which mutual gains accrue. Because continuity has value to both firm and worker, governance features that deter termination (severance pay) and quits (nonvested benefits) and which address and settle disputes in an orderly way (grievance systems) to which the parties ascribe confidence have a lot to recommend them. These can, but need not, take the form of “unions.” Whatever the name, the object is to craft a collective organizational structure (at node C) in which the parties have mutual confidence and that enhances efficiency (Baron and Kreps, 1999, pp. 130–138; Williamson, 1975, pp. 27–80, 1985, pp. 250–262).¹³

¹³The emphasis on collective organization as a governance response is to be distinguished from the earlier work of Gary Becker, where human asset specificity is responsible for upward sloping age-earnings profiles (1962). Becker’s treatment is more in the science of choice tradition whereas mine views asset specificity through the lens of contract. These two are not mutually exclusive. They do, however, invite different public policy interpretations and redirect the empirical research agenda.

(c) Relationship with Sources of Finance

Viewed through the lens of contract, the board of directors is interpreted as a security feature that arises in support of the contract for equity finance (Williamson, 1988). More generally, debt and equity are not merely alternative modes of finance, which is the law and economics construction (Easterbrook and Fischel, 1986; Posner, 1986), but are also alternative modes of governance.

Suppose that a firm is seeking cost-effective finance for the following series of projects: general-purpose, mobile equipment; a general-purpose office building located in a population center; a general-purpose plant located in a manufacturing center; distribution facilities located somewhat more remotely; special-purpose equipment; market and product development expenses; and the like. Suppose further that debt is a governance structure that works almost entirely out of a set of rules: (1) stipulated interest payments will be made at regular intervals; (2) the business will continuously meet certain liquidity tests; (3) principal will be repaid at the loan-expiration date; and (4) in the event of default, the debtholders will exercise preemptive claims against the assets in question. In short, debt is unforgiving if things go poorly.

Such rules-based governance is well-suited to investments of a generic kind ($k = 0$), since the lender can redeploy these to alternative uses and users with little loss of productive value. Debt thus corresponds to market governance at node A. But what about investment projects of more specific (less redeployable) kinds?

Because the value of holding a preemptive claim declines as the degree of asset specificity deepens, rule-based finance of the above described kind will be made on more adverse terms. In effect, using debt to finance such projects would locate the parties at node B, where a hazard premium must be charged. The firm in these circumstances has two choices: sacrifice some of the specialized investment features in favor of greater redeployability (move back to node A), or embed the specialized investment in a governance structure to which better terms of finance will be ascribed. What would the latter entail?

Suppose that a financial instrument called equity is invented and assume that equity has the following governance properties: (1) it bears a residual-claimant status to the firm in both earnings and asset-liquidation respects; (2) it contracts for the duration of the life of the firm; and (3) a board of directors is created and awarded to equity that (a) is elected by the pro-rata votes of those who hold tradeable shares, (b) has the power to replace the management, (c) decides on management compensation, (d) has access to internal performance measures on a timely basis, (e) can authorize audits in depth for special follow-up purposes, (f) is apprised of important investment and operating proposals before they are implemented, and (g) in other respects bears a decision-review and monitoring relation to the firm's management (Fama and Jensen, 1983).¹⁴ So construed, the board of directors is awarded to the holders of equity so as to reduce the cost

¹⁴It will not go unnoticed that this is a rather normative way to describe the board of directors. In practice, many boards are rubber stamps to the management (in exchange for handsome fees). Takeover by tender offer is important for precisely because it is a means by which to replace a protective/complacent/compliant board.

of capital by providing safeguards for projects that have limited redeployability (by moving shareholders from node B to node C).

(d) Regulation and Natural Monopoly

The market-oriented approach to natural monopoly is to auction off the franchise to the highest bidder (Demsetz, 1968; Posner, 1972). But while this is an imaginative proposal, it is not an all-purpose construction. Viewed through the lens of contract, whether this works well or poorly depends on the nature of the transaction and the particulars of governance. The action, once again, resides in the details (Williamson, 1976)—although others counsel that to “expound the details of particular regulations and proposals . . . would serve only to obscure the basic issues” (Posner, 1972, p. 98).

Going beyond the initial bidding competition (“competition for the market”), the governance approach insists upon examining the contract implementation stage. Transactions to which the Fundamental Transformation applies—namely, those requiring significant investments in specific assets and that are subject to considerable market and technological uncertainty—are ones for which the efficacy of simple franchise bidding is problematic. If what had been a large numbers franchise bidding competition at the outset becomes, in effect, a small numbers supply relation during contract implementation and at the contract renewal interval, then the purported efficiency of franchise bidding is problematic.

This is not to say that franchise bidding never works. Neither is it to suggest that decisions to regulate ought not to be revisited—as witness the successful deregulation of trucking (which never should have been regulated to begin with) and more recent efforts to deregulate “network industries” (Peltzman and Whinston, 2000). I would nevertheless urge that examining deregulation through the lens of contracting is instructive for both—as it is for assessing efforts to deregulate electricity in California, where too much deference was given to the (assumed) efficacy of smoothly functioning markets and insufficient attention to potential investment and contractual hazards and appropriate governance responses thereto. As Joskow (2000, p. 51) observes: “Many policy makers and fellow travellers have been surprised by how difficult it has been to create wholesale electricity markets . . . Had policy makers viewed the restructuring challenge using a TCE framework, these potential problems are more likely to have been identified and mechanisms adopted *ex ante* to fix them.”

Here as elsewhere, the lesson is to think contractually: look ahead, recognize potential hazards, and fold these back into the design calculus. Paraphrasing Robert Michels (1962, p. 370) on oligarchy, nothing but a serene and frank examination of the contractual hazards of deregulation will enable us to mitigate these hazards.

5. PUBLIC POLICY

The initial public policy applications of TCE were in the field of industrial organization, especially to antitrust and regulation. These were followed by

public policy applications to labor, health, agriculture, public finance, economic development and reform, and the list goes on. If, indeed, any problem that arises as or can be reformulated as a contracting problem can be examined to advantage through the lens of contracting, then the list of applications is unending.

(a) *Antitrust*

A long-standing puzzle for antitrust was what to make of vertical integration. If the “natural” way to procure a good or service was in the market, why take a transaction out of the market and organize it internally? For that matter, what explained efforts by firms to go beyond simple market exchange and impose customer, territorial, and other vertical market restrictions on distributors? Issues of both kinds arose during the year that I spent as Special Economic Assistant to the head of the Antitrust Division of the U.S. Department of Justice (1966–67). Stringent vertical merger guidelines were issued by the Department in 1968. And the Justice Department mistakenly ascribed anticompetitive purposes to prohibitions against franchisee resale of bicycles in arguing the Schwinn case in 1967.¹⁵ More generally, the prevailing view on vertical market restrictions was that these were to be interpreted “not hospitably in the common law tradition, but inhospitably in the tradition of antitrust.”¹⁶ If the natural boundary of the firm was defined by technology (the firm being viewed as a production function), then what useful purpose was served by interfering with nature?

All well and good in the context of simple market exchange. It overreaches, however, to prohibit node C governance by forcing all market transactions for which $k > 0$ onto node B because the “market is a marvel.” Organization in all of its forms is a marvel—once we understand which transactions go where and why. Monopoly purpose enters into the calculus only when the requisite preconditions for monopoly are satisfied, which is a special case.

(b) *Regulation/Deregulation*

As discussed above, the obvious regulatory problem to which to bring TCE to bear was the imaginative proposal to use franchise bidding as the solution to natural monopoly. In a TCE world where all feasible forms of organization are flawed, it is not surprising that franchise bidding can be expected to work well in some circumstances but not in all.

Other applications of comparative contractual reasoning to regulation (broadly construed) include the much condemned sugar program (Williamson, 1996, pp. 197–210) and consumer health and safety and labor health and safety (Williamson and Bercovitz, 1996, pp. 343–347) issues. More generally, the lens of contract can be applied to the full range of regulatory issues (at local, state,

¹⁵For a discussion see Williamson (1985, pp. 183–189).

¹⁶The quotation is attributed to Turner by Stanley Robinson, 1968, N.Y. State Bar Association, Antitrust Symposium, p. 29.

and federal levels) and such uses have been growing. As matters stand presently, however, TCE is still underused in relation to its potential.

(c) *Other Public Policy*

Avinash Dixit opens his monograph on *The Making of Economic Policy: A Transaction-Cost Politics Perspective* (1996) with a contrast with old-style public finance, where the government was described as an omniscient, omnipotent, and benevolent dictator (1996, p. 8), with the lens of contract approach, according to which all feasible forms of organization are flawed. This latter is an immediate ramification of describing human actors as boundedly rational, which disallows omniscience, and given to subgoal pursuit (opportunism), which disallows benevolence. Upon recognizing implementation obstacles, moreover, omnipotence also drops out.

Two crucial TCE moves endorsed by Dixit are the view of the firm as governance structure and to insist upon remediableness. He observes with reference to the first that the standard normative approach to policy analysis views the process as taking place within (1996, p. 9):

... a social welfare maximizing black box, exactly as the neoclassical theory of production and supply viewed the firm as a profit-maximizing black box. While some useful insights follow from this, it leaves some very important gaps in our understanding and gives us some very misleading ideas about the possibilities of beneficial policy intervention. Economists studying business and industrial organization have long recognized the inadequacy of the neoclassical view of the firm and have developed richer paradigms and models based on the concepts of various kinds of transaction costs. Policy analysis also stands to benefit from such an approach, opening the black box and examining the actual workings of the mechanism inside. That is the starting point, and a recurrent theme, of this monograph.

The remediableness criterion for evaluating public policy proposals is to be contrasted with that of the Pareto criterion. Whereas the latter typically scants issues of feasibility and implementation, the remediableness criterion makes express provision to both. Thus the remediableness criterion holds that an extant practice or mode of organization for which no feasible superior mode can be described and implemented with expected net gains is presumed to be efficient. Reference to feasibility disallows hypothetical ideals (costlessness in any of its forms, including costless bargaining, is thus disallowed). Reference to implementation entails looking ahead to uncover obstacles to implementation, after which the mechanisms are worked out. And presumptions of efficiency are rebuttable—possibly by showing that the initial conditions (often of a political kind) are not acceptable (Williamson, 1996, pp. 208–212).

Whereas lens of choice reasoning holds that a simple display of deadweight losses is dispositive of inefficiency, the lens of contract (remediableness) holds otherwise. Now the analyst is pushed to establish that the proposed reform is feasible (recall that hypothetical ideals are disallowed) and further to demonstrate

that “legitimate” resistance can be overcome in a cost-effective way. Those are not impossible obstacles, but they are very demanding. Among other things, ready recourse to costless compensation of losers (of a Hicks-Kaldor kind) is disallowed.

6. CONCLUSIONS

Robert Solow’s prescription for doing good economics is set out in three injunctions: keep it simple; get it right; make it plausible (2001, p. 111). Keeping it simple entails stripping away the inessentials and going for the main case (the jugular). Getting it right “includes translating economic concepts into accurate mathematics (or diagrams, or words) and making sure that further logical operations are correctly performed and verified” (Solow, 2001, p. 112). Making it plausible entails describing human actors in (reasonably) veridical ways and maintaining meaningful contact with the phenomena of interest (contractual or otherwise).

To this, moreover, I would add a fourth injunction: derive refutable implications to which the relevant (often microanalytic) data are brought to bear. Nicholas Georgescu-Roegen has a felicitous way of putting it: “The purpose of science in general is not prediction, but knowledge for its own sake,” yet prediction is “the touchstone of scientific knowledge” (1971, p. 37).

Why the fourth injunction? This is necessitated by the need to choose among alternative theories that purport to deal with the same phenomenon—say vertical integration—and (more or less) satisfy the first three injunctions. Thus assume that all of the models are tractable, that the logic of each hangs together, and that agreement cannot be reached as to what constitutes veridicality and meaningful contact with the phenomena. Does each candidate theory then have equal claims for our attention? Or should we be more demanding? This is where refutable implications and empirical testing come in: ask each would-be theory to stand up and be counted.

Why more economists are not insistent upon deriving refutable implications and submitting these to empirical tests is a puzzle. One possibility is that the world of theory is set apart and has a life of its own. A second possibility is that some economists do not agree that refutable implications and testing are important. Another is that some theories are truly fanciful and their protagonists would be discomfited by disclosure. A fourth is that the refutable implications of favored theories are contradicted by the data. And perhaps there are still other reasons. Be that as it may, a multiplicity of theories, some of which are vacuous and others of which are fanciful, is an embarrassment to the pragmatically oriented members of the tribe. Among this subset, insistence upon the fourth injunction—derive refutable implications and submit these to the data—is growing.

TCE responds to the injunction of keeping it simple by taking economizing on transaction costs to be the main case. The logic of economic organization is

that of discriminating alignment (the implementation of which requires that the key attributes of transactions and governance structures be named and the logic of efficient alignment be worked out). The main response to the plausibility injunction is to describe human actors in more veridical terms—in cognitive, self-interestedness, and feasible foresight respects. And TCE is insistent upon deriving refutable implications to which the data are thereafter brought to bear.

As described elsewhere, TCE has progressed from informal into preformal, semi-formal, and fully formal stages. As matters stand presently, however, some efforts at fully formal modelling lose contact with key issues.¹⁷ Specifically, if adaptation (of autonomous and cooperative kinds) is truly the central problem of economic organization, then to annihilate ex post maladaptation (by making implausible assumptions of common knowledge of payoffs and costless bargaining), thereby to focus entirely on ex ante incentive alignment, is deeply problematic. Recent formal models have nevertheless begun to restore attention to ex post governance (Bajari and Tadelis, 2001).

However such fully formal modelling shapes up, there is broad agreement that work of a transaction cost economics kind has helped to transform our understanding of complex contracting and economic organization (in both theoretical and public policy respects) and that applications outside of economics are growing and will continue.

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¹⁷I have reference to the Property Rights Theory of firm and market organization (Hart, 1995), which Bernard Salanié mistakenly describes as formalizing "the intuitions of transaction cost economics, as created by Coase and Williamson" (1997, p. 176). For a discussion, see Williamson (2002a).

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