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Transaction Cost Economics: An Introduction

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Abstract:

This overview of transaction cost economics is organized around the “Carnegie Triple” – be disciplined; be interdisciplinary; have an active mind. The first of these urges those who would open up the black box of economic organization to do so in a modest, slow, molecular, definitive way, with the object of deriving refutable implications and submitting these to empirical testing. The second recommends that the student of economic organization be prepared to cross disciplinary boundaries if and as this is needed to preserve veridical contact with the phenomena. The injunction have an active mind is implemented by being curious and asking the question “What is going on here?”

The paper concludes with a discussion of operationalization.

JEL: D2, D73, D86, L2

Transaction Cost Economics: An Introduction

Oliver E. Williamson

This overview of transaction cost economics differs from prior overviews to which I have contributed in two respects: it presumes little previous knowledge of the transaction cost economics (hereafter TCE) literature; and it is organized around the “Carnegie Triple” – be disciplined; be interdisciplinary; have an active mind. It is partly autobiographical on that account.¹

Section 1 discusses the Carnegie Triple and sets out five key quotations that anchor the transaction cost economics project. Sections 2 through 4 describe how TCE implements each element in the triple. Section 5 discusses operationalization. The conclusions follow in Section 6.

1. Introduction

1.1 The Carnegie Triple

It was my privilege to have been a graduate student at the Graduate School of Industrial Management at the Carnegie Institute of Technology (now the Tepper School of Business at Carnegie-Mellon University) from 1960 through 1963. These were halcyon years for GSIA.² The small but accomplished faculty included Herbert Simon, Franco Modigliani, Merton Miller, Richard Cyert, James March, John Muth, Allan Meltzer, and William Cooper, the first three being subsequently awarded Nobel Laureates in Economics. The graduate program was in three parts: economics, organization theory, and operations research. All of the graduate students took core courses in all three and subsequently specialized in one. My major was in economics,

but I drew continuously on my training in organization theory (and selectively on operations research).

The research atmosphere at Carnegie was exhilarating. Old issues were revisited and new issues were opened up. Upon reflection, I describe the training and research at Carnegie in terms of three imperatives: be disciplined; be interdisciplinary; have an active mind. It has been my experience that all applied microeconomists subscribe to the first of these and many to the third. The imperative “be interdisciplinary” is more controversial. Many students (mine included) boggle at organization theory.

Partly that is because organization theory is an inherently difficult subject. Also, few faculties have the likes of Simon, Cyert, and March to learn from. Whatever, my advice to students is to go native by removing their economics cap and putting on an organization theory cap when they open the organization theory text and enter the organization theory classroom. What at first appear to be “inaneities” take on an altogether different meaning and significance when they are interpreted not as peculiarities but as intertemporal regularities of complex organizations. Many of these regularities are consequential and need to be factored into the study of economic organization.

1.2 Five quotations

James Buchanan distinguishes between the science of choice (the resource allocation paradigm, which was dominant within economics throughout the 20th century) and the science of contract. He furthermore urges that the science of contract should be given greater prominence: “mutuality of advantage from voluntary exchange ... is the most fundamental of all understandings in economics” (Buchanan, 2001, p.29; emphasis added).

As I have discussed elsewhere (2002a), the lens of contract divides into two related branches: public ordering and private ordering. The latter further divides into ex

ante incentive alignment (agency theory; mechanism design, property rights) and ex post governance branches. Although these two are related, TCE focuses predominantly on the governance of ongoing contractual relations.

This brings me to the second quotation, which is from John R. Commons, who likewise took exception with the all-purpose adequacy of the resource allocation paradigm (prices and output; supply and demand) and reformulated the problem of economic organization as follows: “the ultimate unit of activity ... must contain in itself the three principles on conflict, mutuality and order. This unit is a transaction” (Commons, 1932, p. 4). This prescient two sentence statement prefigures the study of governance in two respects:³ not only does the lens of contract/governance take the transaction to be the basic unit of analysis, but governance is viewed as the means by which to infuse order, thereby to mitigate conflict and realize mutual gains. This is a recurrent theme.

The third quotation goes to the importance of economizing, broadly in the spirit of Frank Knight’s observation that (1941, p. 252; emphasis added):

Men in general, and within limits, wish to behave economically, to make their activities and their organization “efficient” rather than wasteful. This fact does deserve the utmost emphasis; and an adequate definition of the science of economics ... might well make it explicit that the main relevance of the discussion is found in its relation to social policy, assumed to be directed toward the end indicated, of increasing economic efficiency, of reducing waste.

Of the various forms that economizing can take, TCE is predominantly concerned with economizing on transaction costs – drawing inspiration from Ronald Coase (1937, 1960) in this respect.

The fourth quotation is from Herbert Simon: “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” (1985, p. 303) – especially in cognitive and self-interestedness respects. Although Simon and I had our differences (see, for example, Simon (1997) and Williamson (2002)), I always pay attention to statements of his such as this.

The fifth quotation is Jon Elster’s dictum that “explanations in the social sciences should be organized around (partial) mechanisms rather than (general) theories” (1994, p. 75; emphasis in original). I not only agree that much of the relevant action is in the microanalytics, but, by reason of the overwhelming complexity of the social sciences (Simon, 1957, p. 89; Wilson, 1999, p.183), I share his skepticism with general theories. Out of respect for such complexity, “any direction you proceed in has a very high a priori probability of being wrong” on which account “it is good if other people are exploring in other directions” (Simon, 1992, p. 21). Accordingly, TCE also subscribes to pluralism.

The imperative to be disciplined is examined in Section 2. Section 3 discusses organization theory and the law (mainly contract law) as these bear on the imperative to be interdisciplinary. The research orientation of having an active mind is discussed in Section 4. Operationalization is briefly examined in Section 5. Concluding remarks follow.

2. Be Disciplined

2.1 General

Although transaction cost economics has been an interdisciplinary project from the outset (in that law, economics, and organization theory are selectively combined), first and foremost TCE is informed by economics. Standard textbook economics, where the neoclassical resource allocation paradigm and game theoretic reasoning are the

main constructions, is the obvious place to begin. TCE takes exception with the former for its failure to make provision for positive transaction costs, if and as these are believed to be consequential (Coase, 1937, 1960) – as, for example, in examining the make-or-buy decision in the context of vertical integration. But this does not dispute the merits of the neoclassical approach and apparatus as a place to start – and, for many purposes, a place to finish. TCE shares a good deal of common ground with game theory (Kreps, 1999, p. 127), in that the parties to a contract are assumed to have an understanding of the strategic situation within which they are located and position themselves accordingly.⁴ TCE nevertheless differs in that contractual incompleteness sets in as the limits on rationality become binding in relation to transactional complexity. Also, TCE views governance as a means by which to relieve the oppressive logic of “bad games,” of which the prisoners’ dilemma is an exemplar.⁵

More generally, private ordering plays a prominent role in TCE in that, if and as contractual hazards are posed, the immediate parties to an exchange have an incentive to craft contract-specific safeguards – thereby to realize mutual gains. If, moreover, they are unable to mitigate a hazard, they can nevertheless price it out. As discussed in the Appendix, goods and services will be exchanged on better terms with parties who exercise feasible foresight and introduce credible commitments.

Such private ordering improvements do not imply that public ordering assistance is unneeded. Changing the rules of the game, however, should be done mindful of the benefits that accrue to private ordering. With respect to antitrust enforcement, the public policy lesson is this: non-standard and unfamiliar private ordering contracting practices and organizational structures can and often do serve valued economizing purposes – whereas, for a long time, these were presumed to have monopoly purpose and effect.⁶ If instead the economizing purpose to which Knight referred is the “main case,” then this ought to be featured.

The priority given to economic reasoning does not, however, imply exclusivity: economics can not do it all. As discussed in Section 3, organization theory and the law also play important roles.

2.2 Pragmatic methodology

Describing himself as a native informant rather than as a certified methodologist, Robert Solow's "terse description of what one economist thinks he is doing" (2001, p. 111) takes the form of three precepts: keep it simple; get it right; make it plausible. Keeping it simple is accomplished by stripping away inessentials, thereby to focus on first order effects – the main case, as it were – after which qualifications, refinements, and extensions can be introduced. Getting it right entails working out the logic. And making it a plausible means to preserve contact with the phenomena and eschew fanciful constructions.

Solow observes with reference to the simplicity precept that "the very complexity of real life ... [is what] makes simple models so necessary" (2001, p. 111). Keeping it simple requires the student of complexity to prioritize: "Most phenomena are driven by a very few central forces. What a good theory does is to simplify, it pulls out the central forces and gets rid of the rest" (Friedman, 1997, p. 196). Central features and key regularities are uncovered by the application of a focused lens.

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). Especially in the public policy arena (but also more generally), one of these further logical operations is to ascertain whether putative "inefficiencies" survive comparative institutional scrutiny. Because any display of inefficiency simultaneously represents an opportunity for mutual gain, the parties to such transactions have an incentive to relieve inefficiencies (in cost-effective degree). What are the obstacles? What is the best feasible result?

Because the practice of comparing an actual outcome with a hypothetical (zero transaction cost) ideal has been the frequent source of public policy confusion and error,⁷ TCE introduces the remediableness criterion, to wit: an extant practice for which no superior feasible alternative can be described and implemented with expected net gain is presumed to be efficient.⁸ This rebuttable presumption has the merit of forcing the analyst to confront difficult choices rather than become distracted by and enamored with unworkable ideals.

Plausible simple models of complex phenomena ought “to make sense for ‘reasonable’ or ‘plausible’ values of the important parameters” (Solow, 2001, p. 112). Also, because “not everything that is logically consistent is credulous” (Kreps, 1999, p. 125), fanciful constructions that lose contact with the phenomena are suspect – especially if alternative and more veridical models yield refutable implications that are congruent with the data.

This last brings me to a fourth precept: derive refutable implications to which the relevant (often microanalytic) data are brought to bear. Nicholas Georgescu-Roegen had 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).

To be sure, new theories rarely appear full blown but evolve through a progression during which the theory and evidence are interactive (Newell, 1990, p. 14):

Theories cumulate. They are refined and reformulated, corrected and expanded. Thus, we are not living in the world of Popper ... [Theories are not] shot down with a falsification bullet.... Theories are more like graduate students – once admitted you try hard to avoid flunking them out.... Theories are things to be nurtured and changed and built up.

Sooner or later, however, the time comes for a reckoning. All would-be theories need to stand up and be counted.

Most social scientists know in their bones that theories that are congruent with the data are more influential.⁹ Milton Friedman's reflections on a lifetime of work are pertinent: "I believe in every area where I feel that I have had some influence it has occurred less because of the pure analysis than it has because of the empirical evidence that I have been able to organize."¹⁰

3. Be Interdisciplinary

Although there are many phenomena for which the application of self-contained neoclassical reasoning is altogether sufficient (Reder, 1999), students of complex organization should be alert to the possibility that some – indeed, many – phenomena deviate from the neoclassical ideal in consequential ways. Mechanical application of neoclassical reasoning can and sometimes does lead to contrived, convoluted, and mistaken interpretations.

The injunction to "be interdisciplinary" actually overstates. The qualified version is this: be prepared to cross disciplinary boundaries if and as this is needed to preserve contact with the phenomena. Being interdisciplinary is conditional, therefore, on a perceived need and is introduced strictly in a pragmatic way. Such conditionality notwithstanding, training in one or more of the contiguous social sciences is instructive for all students of economic organization. The pragmatic reason for such training is this: economists who lack an appreciation that some of what is going on out there has non-economic origins will be neglectful of or will misinterpret forces that are responsible for consequential regularities that ought to be taken into account. As hitherto indicated, TCE joins economics with organization theory and selected aspects of the law (especially contract law).

3.1 Organization theory

Organization theory is a vast subject and comes in many flavors (Scott, 1987). My uses of organization theory rely mainly on the “rational systems” approach that is associated with Chester Barnard, Herbert Simon, and Carnegie in its heyday (March and Simon, 1958).¹¹ As matters stand presently, the three chief contributions of organization theory to TCE are the description of human actors, the importance of coordinated adaptation, and recurrent intertemporal regularities.

Human Actors: Attributes of human actors that bear crucially on the lens of contract/governance are cognition, self-interest, and foresight (where the last can be considered an extension upon cognition).

Human actors are described as boundedly rational, by which I mean “intendedly rational, but only limitedly so” (Simon, 1957, p. xxiv). So described, boundedly rational human actors lack hyperrationality but are neither nonrational nor irrational. Rather, such human actors are attempting rationally to cope. For TCE purposes, the key ramification of bounded rationality for the study of contract is that all complex contracts are unavoidably incomplete. The analytically convenient fiction of complete contracting is thus disallowed.

Self interest is described in a two-part way. Routine events are described as benign – in that most people will do what they say most of the time and some will do more. Outliers, however, pose tensions. The spirit of cooperation that facilitates ongoing adaptations to routine disturbances prospectively gives way to a more calculative orientation as the stakes increase. The hazard of opportunism -- defection from the spirit of cooperation in favor of the letter of the contract -- thus arises.

Such defection poses a hazard for interfirm contracts if one or both parties make specialized (nonredeployable) investments in support of the contract. The resulting condition of bilateral dependency need not, however, imply that interfirm contracting is

no longer viable. To the contrary, the capacity for “feasible foresight” permits the parties to look ahead, uncover possible hazards, work out the mechanisms, and thereafter craft credible commitments. Boundedly rational human agents who possess feasible foresight will thus attempt to mitigate contractual hazards in cost-effective degree, as a result of which the efficacy of contracting is extended over a wider range. Fewer transactions are taken out of markets and organized internally on this account.

Coordinated Adaptation: Adaptation is taken to be the main problem of economic organization, of which two kinds are distinguished: autonomous adaptations in the market that are elicited by changes in relative prices, as described by the economist Friedrich Hayek (1945), and coordinated adaptations of a “conscious, deliberate, purposeful kind” accomplished with the support of hierarchy, as described by the organization theorist Chester Barnard (1938). Conditional on the attributes of transactions, adaptations of both kinds are important – which is to say that TCE examines markets and hierarchies in a combined way (rather than persist with the old ideological divide between markets or hierarchies). Explicating the differential efficacy of alternative modes of governance – whereby markets enjoy the advantage in autonomous adaptation respects, the advantage shifts to hierarchy as transactions pose a greater need for consciously coordinated adaptations, and hybrid modes are a compromise mode that display adaptive capacities of both kinds (albeit in intermediate degree) – is central to a predictive theory of governance.

Intertemporal Regularities: As Philip Selznick has observed, organization, like the law, has a “life of its own” (1966, p. 10). If and as intertemporal regularities have a significant impact on the organization of economic activities, such regularities need to be uncovered, interpreted, and the economic ramifications worked out. Among the significant regularities that bear on the economics of governance are the entrenchment advantages that accrue to leadership. Both in politics (Michels, 1962) and more

generally, “there is a tendency for decisions to be qualified by the special goals and problems of those to whom [leadership is delegated]” (Selznick, 1966, p. 258).

The special goals to which Selznick refers often take the form of goal distortions (managerial discretion) and career concerns (influence costs) while many of the problems take the form of bureaucratic costs. In the degree to which these are consequential, intertemporal effects of all three kinds are properly factored into the comparative governance calculus. Most economic theories of firm and market organization nevertheless ignore these and/or regard them as outside the ambit. Thus although Oskar Lange described bureaucratization rather than resource allocation as the “real danger of socialism,” he chose to set bureaucratization aside because it “belongs to the field of sociology rather than... economic theory” (1938, p.109). This reluctance to cross interdisciplinary boundaries, if and as the phenomena warrant, is still widespread.

The Fundamental Transformation is perhaps the most distinctive intertemporal regularity within the TCE setup. It refers to the transformation of a large numbers bidding competition at the outset into a small numbers supply relation during contract implementation and at contract renewal intervals for transactions that are supported by significant investments in transaction specific assets. Such bilateral dependencies present the parties with contractual hazards for which, as discussed above, governance supports are introduced to effect hazard mitigation in cost effective degree.

Going public with a high-tech startup firm or leveraged buyout is also attended by significant intertemporal transformations. Startups are high-risk undertakings that combine venture capitalists with entrepreneurial, technical, and legal talent in a race to be first. Real-time responsiveness is of the essence. LBOs respond to financial and organizational misalignments by mobilizing finance, replacing the incumbent management, and reshaping the firm and its financing by substituting debt for equity (as appropriate) and selling or spinning off unrelated parts. The big rewards for each are

concentrated in the “going public” transaction, after which the high powered incentives and real-time responsiveness of the entrepreneurial actors give way to a business-as-usual enterprise in which routines set in.

Also, the array of phenomena that cluster under the rubric of “path dependency” all involve intertemporal transformations of one type or another. Whereas many of these transformations are commonly interpreted as unfair or anti-competitive from an orthodox perspective, TCE interprets all path dependent practices with reference to the aforementioned remediableness criterion. Awaiting a demonstration that superior feasible and implementable alternatives can be devised, social scientists need to come to terms with, rather than denounce, unwanted path dependent outcomes.

Finally, although some students of economic organization aver that TCE is remiss in “dynamic” respects, I would observe that TCE has been an exercise in adaptive, intertemporal economic organization from the outset (Williamson, 1971, 1975, 1985, 1991).¹² To be sure, featuring adaptive differences among alternative modes of governance and making provision for intertemporal transformations are primitive forms of dynamics. Critics who would push beyond are invited to do so – mindful of the fact that it is easier to say, rather than do, dynamics.¹³

3.2 Contract law

Whereas the details of firm and market organization are scanted under lens of choice setups, the lens of contract/governance describes each generic mode of governance (market, hybrid, hierarchy) as a distinct syndrome of attributes, each of which differs in incentive intensity, administrative control, and contract law respects. These differences give rise to different adaptive strengths and weaknesses.

Of these attribute differences, I call attention here principally to the way in which contract law regimes vary across modes. By contrast with economic orthodoxy, which

implicitly assumes that there is a single, all-purpose law of contract that is costlessly enforced by well-informed courts, the lens of contract treats court ordering as a special case and holds that the operative law of contract varies among alternative modes of governance.

Thus, whereas the contract law of markets is legalistic (corresponds to the ideal transaction in both law and economics, whereby disputes are settled by court-ordered money damages, after which each party goes its own way), hybrid transactions and, especially, hierarchical transactions are ones for which continuity is valued. The common view of contract as legal rules thus gives way to the more elastic concept of “contract as framework,” where the framework “never accurately indicates real working relations, but ... affords 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.” (Llewellyn, 1931, p. 736).

Whereas contract as framework applies to hybrid transactions, the coordinated adaptations of the conscious, deliberate, purposeful kind to which Barnard referred are realized through administration. This entails taking transactions out of markets and organizing them internally – to which yet another law of contract, the contract law of internal organization, applies. Except as fraud, illegality or conflict of interest are shown, courts have the good sense to refuse to hear interdivisional disputes that arise within firms – with respect, for example, to transfer pricing, overhead, accounting, the costs to be ascribed to intrafirm delays, failures of quality, and the like. In effect, the contract law of internal organization is that of forbearance, according to which the firm becomes its own court of ultimate appeal (Williamson, 1991). Firms for this reason are able to exercise fiat that markets cannot. Whereas such fiat differences between firm and market were long recognized by organization theorists, Armen Alchian and Harold

Demsetz (1972), among others, held that firm and market are indistinguishable in fiat respects. Not only does TCE hold otherwise, but the contract law differences that TCE associates with alternative modes of governance are among the reasons why governance structures differ in discrete structural ways.

4. Have an Active Mind

In the degree to which interdisciplinary training opens windows and promotes curiosity, which it often does, the Carnegie program encouraged the student of economic organization to have an active mind. Roy D'Andrade (1986) captures the spirit in his contrast between authoritative and inquiring research orientations. Whereas the former is characterized by an advanced state of development, is self-confident, and declares that "This is the law here," the latter is more tentative, pluralist, and exploratory and poses the question, "What is going on here?" The first is commonly of a top-down kind; the latter favors bottom-up constructions. Theoretical physics is widely regarded as the exemplar of the imperial tradition, but parts of economics also have these aspirations – as witness Solow's observation that "there is a lot to be said in favor of staring at the piece of reality you are studying and asking, just what is going on here? Economists who are enamored of the physics style seem to bypass that stage" (Solow, 1997, p. 57; emphasis added).

To be sure, few economists have no curiosity whatsoever with the phenomena. The readiness, however, to impose preconceptions – rather than to get close to the phenomena by asking and attempting to answer the question, "What is going on here?" – is nevertheless widespread, as John McMillan notes in contrasting his research strategy and that of others (2002, p. 225; emphasis added):

To answer any question about the economy, you need some good theory to organize your thoughts and some facts to ensure that they are on target. You have to look and see how things actually work or do not work. That might seem so trite as not to be worth saying, but assertions about economic matters that are based more on preconceptions than on the specifics of the situation are still regrettably common.

Those who have an abiding interest in economic organization are thus advised to combine detailed knowledge of the phenomena, to which the “look and see” contributions of organization theorists are frequently pertinent, with a focused lens. Indeed some, myself included, subscribe to pluralism – in that a deeper understanding of complex phenomena will sometimes benefit from the application of several focused lenses (some of which may be rival but others complementary).

Note, moreover, that the imperial and inquiring research traditions can co-exist, sometimes sequentially. To illustrate, whereas the vast transformation in corporate finance that was accomplished when Franco Modigliani and Merton Miller (1958) pushed the logic of zero transaction cost contracting to completion, many of the follow-on qualifications to the Modigliani-Miller theorem assumed, implicitly if not explicitly, that transaction costs are positive. For students at Carnegie when Modigliani, Miller, Muth, Simon, March, and others were all on the faculty, this was a constructive tension.

5. Operationalization

Ronald Coase’s 1937 paper on “The Nature of the Firm” expressly confronted an embarrassing lapse: whereas the distribution of activity between firm and market had been taken as given by economists, the boundary of the firm should be derived from the

application of economic reasoning to the make-or-buy decision. Coase traced this lapse to the prevailing assumption within economics that transaction costs were zero. Even more embarrassing was his subsequent demonstration that externalities (more generally, market failures) would vanish when the logic of zero transaction costs is pushed to completion (Coase, 1960), since the parties would everywhere realize mutual gains by costlessly bargaining to an efficient outcome.

Although transaction cost reasoning began to take hold during the 1960s, such costs were often invoked in a one-sided way – as with the argument was that, given the presumed efficacy of costless bargaining, the role of the government reduced to defining and enforcing property rights (Coase, 1959). Also, transaction costs were frequently invoked in a tautological way, thereby to “explain” any puzzling phenomenon whatsoever after the fact. Ready recourse to such reasoning earned transaction costs a “well-deserved bad name” (Fischer, 1977, p. 322, n. 5).

Both the longstanding neglect of transaction costs and ad hoc uses of transaction cost reasoning were unsatisfactory. What to do? The unmet need was to operationalize the concept of transaction cost, broadly with reference to the four precepts of pragmatic methodology. Addressing the issues in a comparative institutional way with applications to specific phenomena facilitated operationalization efforts. Comparative analysis, moreover, relieves the need to take absolute measures of transaction cost, since the object is to ascertain the factors that are responsible for differential transaction costs as between alternative modes of governance.¹⁴ Efforts that were begun in the 1970s continue to this day. As elaborated elsewhere, key operationalizing moves include the following:

- (1) Rather than proceed in a fully general way, TCE focuses on specific phenomena, of which vertical integration (the make-or-buy decision) is the paradigm problem.

- This choice had two advantages: it addresses the puzzle to which Coase (1937) referred; and transactions in intermediate product markets are less beset by contractual complications (such as asymmetries of information, resources, expertise, and risk aversion) than are other transactions.
- (2) The transaction is made the basic unit of analysis and is thereafter dimensionalized (with emphasis on asset specificity, contractual disturbances (uncertainty), and frequency).
 - (3) Alternative modes of governance are described as internally consistent syndromes of attributes to which distinctive strengths and weaknesses – in autonomous and coordinated adaptation respects – accrue.
 - (4) Economizing on transaction cost is taken to be the cutting edge, where this is implemented through the discriminating alignment hypothesis, to wit: transactions, which differ in their attributes, are aligned with governance structures, which differ in their cost and competence, so as to effect a transaction cost economizing outcome.
 - (5) The basic regularities are captured in the simple contractual schema (see the Appendix), to which many other contractual phenomena can be interpreted as variations on a theme. Indeed, any issue that arises as or can be reconceptualized as a contracting problem can be interpreted to advantage in transaction cost economizing terms.
 - (6) Empirical tests of the predictions of the theory have ensued. By contrast with theories of economic organization that yield few refutable implications and/or are very nearly nontestable, transaction cost economics invites and has benefited from empirical testing. Indeed, “despite what almost 30 years ago may have

appeared to be insurmountable obstacles to acquiring the relevant data [which are often microanalytic and require primary data], today transaction cost economics stands on a remarkably broad empirical foundation” (Geyskens, Steenkamp, and Kumar, 2006, p. 531). There is no question but that TCE is more influential because of the empirical work that it has engendered.

- (7) Public policy has been transformed by working up the efficiency/inefficiency ramifications of TCE for complex contract and economic organization.¹⁵

6. Conclusions

As compared with most contributions to the rapidly growing literature on contract and economic organization, TCE is more interdisciplinary, insistently emphasizes refutable implications, invites empirical testing, and is more concerned with public policy ramifications. Although still undergoing development in fully formal modeling respects (Bajari and Tadelis, 2001; Tadelis, 2002; Levin and Tadelis, 2004; Tadelis and Williamson, 2007), the combination of semi-formal models (Riordan and Williamson, 1985), diagrams (such as the simple contractual schema), and a widely shared verbal understanding of the logic of discriminating alignment have provided the impetus for the numerous TCE applications described elsewhere (Williamson, 1990, pp. 192-194; 2005b; Macher and Richman, 2006). Indeed, the move from words to diagrams to mathematical models is what the natural progression contemplates.

Headway in the future will be realized as it has in the past – not by the creation of a general theory but by proceeding in a modest, slow, molecular, definitive way, placing block upon block until the value added cannot be denied. It is both noteworthy and encouraging that so many young scholars have found productive ways to connect. TCE, moreover, has benefited from rival and complementary perspectives – especially those that subscribe to the four precepts of pragmatic methodology. Such pluralism brings

energy to the elusive ambition of realizing the “science of organization” to which Chester Barnard (1938) made reference almost 70 years ago. As the forthcoming Handbook of Organizational Economics (Gibbons and Roberts, 2007) reveals, the economics of organization, of which TCE is a part, is a vibrant research agenda.

Appendix

The Simple Contractual Schema

The paradigm transaction for TCE is vertical integration (or, in more mundane terms, the make-or-buy decision). Not only is vertical integration the obvious candidate transaction (Coase, 1937), but, because it is less beset with asymmetries of information, budget, legal talent, risk aversion, and the like than are many other transactions, it is simpler. Not only are transaction cost features more transparent for the make-or-buy decision, but the simple contractual schema described below applies (with variation) to the study of transactions more generally.

Thus 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. Letting k be a measure of asset specificity, the transactions in Figure 1 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. Transactions that use the special purpose technology are those for which $k > 0$. Such transactions give rise to bilateral dependencies, in that the parties have incentives to promote continuity, thereby to safeguard 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 1 corresponds to the ideal transaction in law and economics: there being an absence of dependency, governance is accomplished through competition 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.

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 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 at Node C serve to reduce the contractual hazard, as compared with Node B, so the contractual hazard premium will be lowered. One implication is that suppliers do not need to petition buyers to provide safeguards. Because buyers will receive goods and services on better terms (lower price) when added security is provided, buyers have the incentive to offer credible commitments.

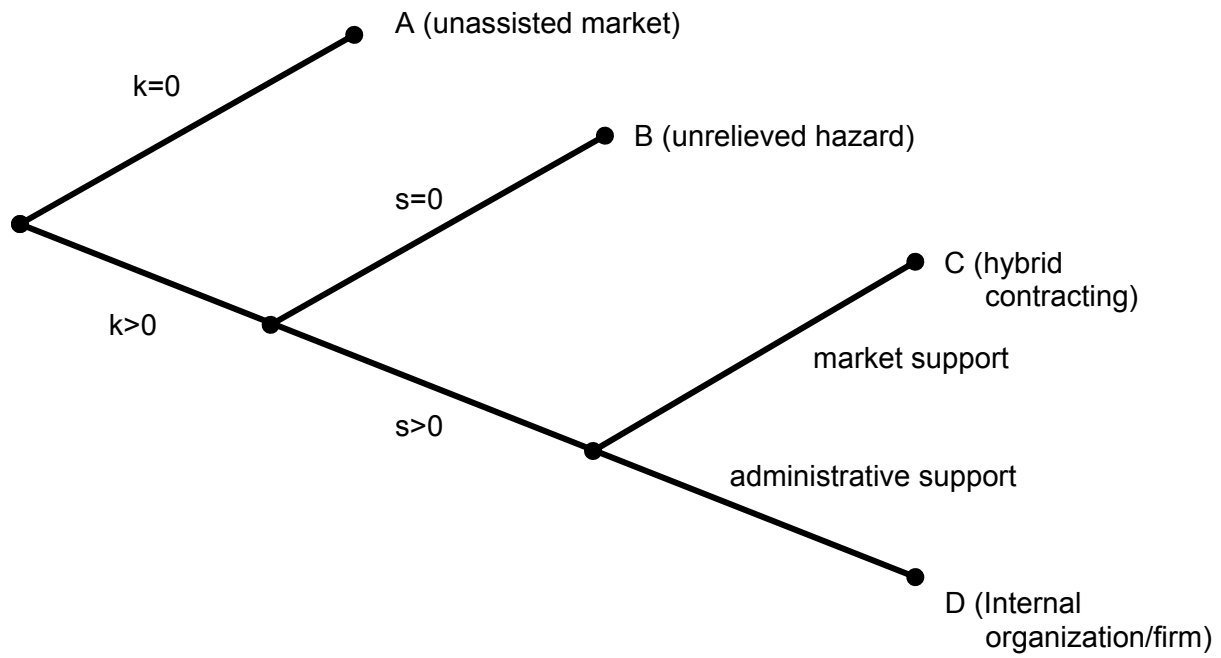


Figure 1.
Simple Contractual Schema

Footnotes

- * This paper was prepared for and will appear as chapter 1 in the forthcoming volume The Elgar Companion to Transaction Cost Economics, Peter Klein and Michael Sykuta, eds., Cheltenham, UK: Edward Elgar (2007).
- 1. Overviews that I have done previously have gone more thoroughly into the mechanisms of governance and applications of the lens of contract/governance (Williamson, 1989, 1998, 2002b, 2005a). See also the recent overviews of Claude Menard (2004) and Peter Klein, Joseph Mahoney, and Jackson Nickerson (2004) as well as the forthcoming paper by Steven Tadelis and Williamson (2007).

The target audience for this paper is students who have completed their second year of a PhD program in economics, business, or the contiguous social sciences and are considering whether to take courses in the economics of organization and/or the economics of institutions preparatory to doing their dissertations. The common features that I associate with success by these students are these: they have a good grasp of textbook microeconomic theory and of the core courses in their respective fields; they have interdisciplinary interests; they have an abiding curiosity in understanding the purposes served by complex economic (and noneconomic) organizations; and, because the action resides in the details, they are prepared to engage the microanalytics in theoretical, empirical, and public policy respects.

- 2. Jacques Dreze, who was a visitor at Carnegie, speaks for me and many others in recalling his time at Carnegie as follows: "Never since have I experienced such intellectual excitement" (1995, p. 123).

3. This and other insights of older style institutional economics would nevertheless remain dormant for many years, primarily for lack of a positive research agenda (Stigler, 1983, p.170) -- which I take to mean lack of operationalization. Older style institutional economics did not, however, lack for good ideas, views to the contrary notwithstanding (Coase, 1984, pp. 229-230). The New Institutional Economics, of which TCE is a part, draws selectively on the insights of Commons and others and seeks to breathe operational content into them.
4. "Speaking as a tool-fashioner interested in developing tools that better deal with the world-as-it-is, I believe game theory (the tool) has more to learn from transaction-cost economics than it will have to give, at least initially" (Kreps, 1999, p. 122; emphasis added). But Kreps plainly contemplates give-and-take.
5. Rather than assume that players are accepting of the coercive payoffs that are associated with the prisoners' dilemma – according to which each criminal is induced to confess, whereas both would be better off if they could commit not to confess – TCE assumes that the criminals (or their handlers, such as the mafia) can, upon looking ahead, take ex ante actions to alter the payoffs by introducing private ordering penalties to deter defections. This latter is a governance move, variants of which can be introduced into many other bad games.
6. Jack Muth, in his low-key way, suggested to me (when I was working on my dissertation on managerial discretion at Carnegie) that since shareholders were not ignorant of deviations from single-minded profit maximization, they would adjust the terms of trade for equity capital accordingly.
7. As Ronald Coase observed of economic thinking in the 1970s, "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 un-understandable practices tends to be very large, and the reliance on a monopoly explanation frequent” (1972, p. 67). Such knee-jerk public policy nevertheless persisted. Here, as elsewhere, it takes a theory to beat a theory.
8. See Coase (1964) and Harold Demsetz (1967).
 9. As Dr. Stephen Strauss, who directs the National Center for Complementary and Alternative Medicine puts it, “Things that are wrong are ultimately put aside, and things that are right gain traction. There are the conflicting tides of belief and fact, and each has its own chronology. Things don’t change quickly, but over time a cumulative body of evidence becomes compelling” (as quoted by Jerome Groopman, 2006, p. A12). There is no question but that TCE has been more influential because of the large and growing body of empirical research that it has generated (Klein and Shelanski, 1995; Macher and Richman, 2006).
 10. Personal communication, February 6, 2006, from Milton Friedman to the author.
 11. As I have discussed elsewhere, parts of the “resource dependency” literature are pertinent but fail to push the logic to completion. Of special relevance to TCE is the potentially important concept of embeddedness (Granovetter, 1985). Regrettably, 20 years later and counting, this concept still suffers for lack of operationalization. Be that as it may, economics needs to be informed by those contributions of organization theory that withstand the test of time.
 12. TCE implements the proposition that adaptation (of autonomous and coordinated kinds) is the central purpose of economic organization – which is an intertemporal construction to which refutable implications accrue.

13. For an early and primitive effort to work up the dynamics of managerial discretion, see Williamson (1970, chap. 5).
14. “In general, much cruder and simpler arguments will suffice to demonstrate an inequality between two quantities than are required to show the conditions under which these quantities are equated at the margin” (Simon, 1978, p. 6).
15. Corporate governance provides a recent example of the interaction of theory and evidence. Thus whereas the initial application of the lens of contract to equity finance led into an interpretation of the board of directors as monitor, thereby to safeguard the interests of shareholders, an examination of boards in practice suggests a dual-purpose interpretation whereby the board serves two credible contracting purposes: monitoring and delegation (Williamson, 2007).

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