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CONTRACTUAL CHOICE

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Abstract

This chapter discusses alternative theories of contract choice and design with special emphasis on (i) the interaction between contract design and contract enforcement and (ii) the explanatory power of alternative theories. After discussing the primary functions of contract, the entry reviews the assumptions and implications for contract design of the three dominant approaches to contracting in economics. An overview of the empirical literature on contracting and contractual choice identifies the main empirical regularities and their relation to the theory. A final section addresses implications for contract law and enforcement and directions for future research.

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1. Introduction

A contract, at its most basic level, is a legally enforceable agreement. Although economists - and occasionally lawyers - have used the term more expansively to describe essentially any transaction, the term *contract* as used in this chapter is reserved for formal, legal commitments to which each party gives express (though not necessarily written) approval and to which a particular body of law applies. 'Breaching a contract' differs from 'canceling an order', to use Stewart Macaulay's (1963, p. 61) dichotomy. Ultimately, what distinguishes a contract from a mere transaction is the opportunity contracts afford transactors to invoke the formal dispute resolution machinery and coercive power of the state to enforce promises.

Besides distinguishing true contracts from 'implicit contracts' or self-enforcing agreements, this definition of contract highlights the fundamental link between contract design, on the one hand, and contract enforcement, on the other: the choice of contract terms will depend in part on the legal rules and enforcement policies transactors expect courts to follow while, at the same time, the enforcement practices of efficiency-minded courts will depend on what courts perceive as the purpose and impediments to

contracting. In short, the analysis of contract law and enforcement presupposes a theory of contracting behavior, and vice versa.

Despite this interdependence, the literatures on contract design and contract enforcement have largely developed independently of one another. Economic theories of contracting, for the most part, give little explicit attention to enforcement issues, the presumption being that courts will see to it (subject only to verifiability constraints) that whatever terms contracting parties arrive at are fulfilled. Indeed, enforcing contracts as written is the court's *only* function in mainstream contract theory (see, for example, Tirole, 1994). This judicial deference to contracts in economic theory contrasts with the far more intrusive role of courts in economic analyses of contract *law*, in which courts are called on to adjudicate disputes, fill gaps, and devise and implement default rules.

Perspectives on contracting can be divided into three broad categories. The first consists of formal models associated with the principal-agent and asymmetric information literature, including theories of both complete and incomplete contracting; the second covers perspectives on contracting implicit in the law and economics literature on contract law and enforcement; while the third consists of what has come to be known as relational contracting theory, an approach often associated with transaction cost economics. Dimensions along which the theories differ include the functions of contracting, the impediments to contracting, and the role of courts and their implications for legal rules and contract enforcement. Last but not least, the theories differ in their ability to explain and predict actual contracting behavior.

2. Why Contract?

As the definition in the introduction suggests, the essence of contract is commitment. Without some form of assurance that others will, when the time comes, uphold their end of a bargain, individuals will be justifiably reluctant to make investments, forego opportunities, or take other actions necessary to realize the full value of exchange. To be sure, reputation considerations - the prospect that trading partners will withhold future cooperation - often provide that assurance (Telser, 1980), especially in business transactions (Macaulay, 1963). But where the size or credibility of nonlegal sanctions is insufficient to constrain opportunism, contracting offers an additional recourse: by contracting, transactors expose themselves to legal sanctions for failing to honor their commitments.

Beyond this basic commitment-enhancing function, contract theorists generally associate three broad motives with contracting: risk transfer, incentive alignment, and transaction cost economizing. In pure insurance or risk-transfer transactions, the objective is to shift risk to the less risk-averse

transactor or 'low-cost risk bearer' (Cheung, 1969; Stiglitz, 1974). In incentive contracts, the aim is to align the parties' (commonly, a principal and agent) individual incentives to take actions or reveal private information with their joint-surplus maximizing interests (for example, Hart and Holmstrom, 1987). Finally, transaction cost economists emphasize the use of contracts to reduce various costs of transacting, especially, *ex post* bargaining and 'hold-up' costs in transactions supported by relationship-specific investments (Williamson, 1975, 1979; Klein, Crawford, and Alchian, 1978) and *ex ante* sorting and search costs in contexts where additional information serves merely to redistribute rather than expand the available surplus (Kenny and Klein, 1983; Goldberg, 1985). While the essence of contracting is commitment, the design and interpretation of contractual agreements will depend on which of these three motives dominates.

3. Formal Economic Theories of Contractual Choice

The search for contract terms that yield efficient outcomes is the subject of a prodigious theoretical literature in economics. The customary starting point for that inquiry is the complete contingent claims contract associated with the work of Arrow and Debreu (see, for example, Hart and Holmstrom, 1987). Although originally conceived as an analytical tool for modeling competitive equilibrium rather than as a theory of contracting *per se* (see Guesnerie, 1992), the efficiency properties associated with contingent trade in the Arrow-Debreu framework made complete contingent claims contracts - contracts specifying the physical characteristics, date, location, and price of a commodity for every future state of nature - appealing to contract theorists as an archetype against which to compare more realistic agreements: Arrow-Debreu complete contingent claims contracts represent what transactors would write in an ideal world free from 'imperfections'.

Mainstream contract theories developed specifically to analyze actual contracting practices fall into two categories depending on the nature and source of the 'real world' imperfections they emphasize. So-called *complete contract theory* analyzes the efficiency and contract design implications of the inability of courts to verify particular events or outcomes. Departures from the Arrow-Debreu ideal in complete contract theory thus derive from imperfections or limitations of adjudicators at the contract execution stage. *Incomplete contract theory*, in contrast, is concerned with the design and efficiency consequences of imperfections arising during contract *formation*, specifically, the limited capacity of transactors to anticipate, identify and describe optimal responses to future events.

3.1 Complete Contracting

The cornerstone of complete contract theory is the recognition that courts may not be able to verify some contingencies or outcomes and that contracting parties, therefore, may not be able to condition performance on every relevant contingency. The concern posed by nonverifiability is that, with the court no longer able to determine whether some aspect of promised performance has occurred, transactors stand to gain by strategically withholding information or by altering their behavior in ways that yield private benefits but reduce joint gains. In the standard terminology, the propensity to deviate from joint-surplus maximizing behavior in the presence of asymmetric information is called *moral hazard* when the distortion involves actions or information revelation *ex post*, and *adverse selection* where *ex ante* private information leads only those transactors with less desirable characteristics to transact (the so-called 'lemons' problem).

The problem of contract design in the complete contracting framework consists of discovering a contingent payment schedule, or sharing rule, that is *incentive compatible*, that is, that satisfies the requirement that the contract leave the party with discretion over the unverifiable action at least as well off acting in the parties' joint interests as taking any other feasible action. When only one party's actions affect outcomes and that party is risk neutral, a contract that makes that party the residual claimant (and distributes expected gains to the other via a fixed payment) will be efficient. Nontrivial design tradeoffs arise when aligning one party's incentives results either in inefficient risk sharing (if that party is also the more risk averse of the two) or in inefficient incentives for the other party (the case of double-sided moral hazard). In the latter settings, first-best outcomes will generally not be feasible. (Reviews of this literature can be found in Hart and Holmstrom, 1987, and Furubotn and Richter, 1998, among other sources.)

Although contracts designed to elicit voluntary performance of unverifiable actions depart from the Arrow-Debreu ideal in leaving gains from trade potentially unrealized relative to the cooperative (nonstrategic) outcome, economists generally regard contracts optimally designed to deal with information asymmetries as complete in the sense that such agreements (i) still fully specify each party's performance obligations for every possible contingency, and (ii) yield the best possible outcome given the information available to the courts at the time the agreement is carried out and thus 'never need to be revised or complemented' (Holmstrom and Tirole, 1989, p. 68).

Despite the variety of settings in which risk sharing, moral hazard and adverse selection are potentially important (see below), complete contract theory's performance as a positive theory has been disappointing. Aside from the broad prediction that efficient sharing rules will balance incentives for one party against inefficient risk bearing by that party or the incentives of trading

partners, asymmetric information models yield few testable hypotheses. One reason for this is the 'extreme sensitivity' of optimal incentive schemes to slight changes in the relation between actual performance and verifiable information (Hart and Holmstrom, 1987, p. 105). Complete contract theory also fails to account for the observed simplicity of sharing rules in most real world contracts. Whereas the theory admits potentially detailed and complex payment rules specifying each party's performance obligations for every possible contingency (in the case of discrete contingencies) and elaborate nonlinear pricing rules (in the continuous case), actual contracts incorporate few if any explicit contingencies and generally use simple, typically linear, pricing schemes (Holmstrom and Hart, 1987; Bhattacharyya and Lafontaine, 1995). Complete contract theory has also been faulted for its inability to distinguish between, and therefore account for the choice between, contracting and other institutional and organizational forms such as property rights and the firm.

3.2 *Incomplete Contracting*

Contract theorists consider a contract incomplete, or to contain a 'gap,' if performance of the actual terms of the agreement would leave gains from trade unrealized *given* the information available to the parties and the courts at the time performance takes place (see, for example, Holmstrom and Tirole, 1989, p. 68; Tirole, 1994, p. 18). Under the assumption that transactors possess unlimited foresight and cognition, such an omission could never occur. Incomplete contract theory relaxes the extreme rationality assumption of complete contract theory and assumes that the limits on rationality that make courts less than fully omniscient apply to contracting parties as well: sophisticated but boundedly rational transactors will omit contingencies when the costs of anticipating, devising optimal responses to, and drafting provisions for improbable events outweigh the expected gains in efficiency from doing so. Departures from the Arrow-Debreu ideal may thus arise in incomplete contract theory from failures of the contracting parties to foresee and provide for contingencies in formulating their agreement, instead of or in addition to the inability of courts to verify performance.

The prospect that contracts might leave gains unrealized raises an issue for the analysis of incomplete contracting that is not germane to complete contracting, namely, how, if at all, contracting parties respond to opportunities for mutually advantageous *ex post* adjustment. Two types of models can be distinguished: those that permit renegotiation *ex post*, and those that do not.

(a) *Models without Renegotiation* Although linearity restrictions on sharing rules have often been imposed by complete contract theorists for tractability rather than theoretical or empirical reasons, exogenous restrictions on feasible contracts will, except under special conditions, lead to *ex post* inefficiencies.

Accordingly, linear principal-agent contracts will in general be incomplete. (Not surprisingly, therefore, considerable effort has been applied to identifying the conditions under which linear contracts are sufficient for efficient outcomes; see, for example, Holmstrom and Milgrom, 1987; Bhattacharyya and Lafontaine, 1995.) Early principal-agent models mainly dealt with opportunities for mutually advantageous adjustment within linear contracts by ignoring them; contract terms were presumed to be definitive and immune to *ex post* bargaining, and any 'residual loss' from imperfect adjustment to changing events considered a component of 'agency costs' (Jensen and Meckling, 1976, p. 308; see also Matthewson and Winter, 1985; Allen and Lueck, 1992, 1993.)

Because of their greater tractability and more realistic starting assumptions, linear agency models have been more successful than complete contract theories at generating predictions and explaining observed contracts. Settings in which moral hazard and adverse selection are likely to pose problems for contracting parties are numerous, and many relationships can be cast in principal-agent terms. Linear principal-agent models have been the primary framework for analyzing contract terms in franchising (Matthewson and Winter, 1985; Lal, 1990), agricultural share-cropping (Stiglitz, 1974; Eswaran and Kotwal, 1985), and product warranties (Priest, 1981; Cooper and Ross, 1985), among other settings. The linear agency model has also recently been extended to analyze multi-task settings in which agents perform either multiple activities or a single activity with multiple dimensions (Holmstrom and Milgrom, 1991).

Formal tests of agency model predictions have proved difficult, however. The optimal sharing parameter that is the primary focus of these models depends on factors such as the relative risk aversion of the principal and agent and the relative effects of their actions on joint surplus. Because these factors are difficult or impossible to measure, acceptance of the model often turns on accepting the modeler's risk preference and marginal productivity assumptions (Stigler and Becker, 1977; Allen and Lueck, 1995). More generally, heavy reliance by agency theorists on risk aversion to explain observed contracting practices has been criticized, especially in the context of commercial transactions, for diverting attention from other potentially more important considerations (see Williamson, 1985b, pp. 388-389; Goldberg, 1990).

(b) Models with Renegotiation More recent models of incomplete contracting generally assume that transactors can negotiate to take advantage of any *ex post* gains on the grounds that (i) unrealized gains from trade create an incentive to renegotiate, and (ii) contract law generally allows modification of contract terms by mutual consent. Incorporating renegotiation into the analysis, however, requires a model of bargaining, a perennial difficulty for economic theory. The formal literature on incomplete contracting has generally circumvented that problem by assuming that the parties costlessly negotiate to

the cooperative (Nash) outcome (Grossman and Hart, 1986; Hart and Moore, 1988; Lutz, 1995).

The assumption of costless renegotiation assures *ex post* efficiency and thereby eliminates any role for contracts in establishing *ex post* incentives. Benefits may nevertheless accrue to contracting if either (i) transactors are risk averse or (ii) efficiency requires unverifiable *ex ante* investments. Even though the parties are free to modify their agreements by mutual consent, the ability of either party to enforce the contract's original terms establishes the threat points in any subsequent negotiation. Hence, by contracting, transactors are able to influence the distribution of *ex post* surpluses and, thereby, the allocation of risk and expected return on investments.

Incomplete contract theory has permitted formal analysis of alternative organizational and institutional arrangements, especially the existence and locus of property rights (for example, Grossman and Hart, 1986; Hart and Moore, 1990) for which the complete contract framework was unsuitable. In the eyes of some theorists, however, the gains in analytical scope come at the cost of generality. While sympathizing with the view that individuals are not capable of dealing with unlimited complexity, purists complain that, in the absence of an accepted model of bounded rationality, restrictions on feasible contract forms are unavoidably arbitrary and ad hoc (for example Tirole, 1994, pp. 15-17; Hart and Holmstrom, 1987, pp. 133, 148).

4. Contracting in Law and Economics

In most respects, conceptions of contracting in law and economics conform to those in economic theory more generally. Like mainstream economics, the law and economics literature conceives of contracting as a device for communicating substantive performance objectives. As Goetz and Scott (1985, p. 265) describe it, contracting parties seek first 'to negotiate a subjective understanding about the combination of underlying substantive rights that form the basis for mutually beneficial trade. What remains is an instrumental problem, that of formulating contractual terms that mirror the desired exchange.' Like incomplete contract theory, law and economics also recognizes that limitations of language and foresight generally prevent transactors from drafting all-encompassing agreements, of which Arrow-Debreu contingent claims contracts are again the archetype (for example, Shavell, 1984; Schwartz, 1992a, 1992b; Ayres and Gertner, 1992, p. 730). As a consequence of these imperfections, contracts often contain gaps that leave performance under the contract potentially inefficient, thus creating opportunities for efficiency-enhancing adjustments.

Where law and economics and economic treatments of incomplete contracting diverge is in the manner through which adjustments come about. In economic contract theories, courts mechanically enforce contract terms, and

adjustments, if any, are accomplished through costless renegotiation. In law and economics, the courts, rather than the transactors, evaluate opportunities for adaptation and implement the necessary contractual modifications. In the typical scenario, one of the parties will find performance at the contractually specified price unprofitable and attempt to escape his contractual obligations, leading the other party to bring suit to enforce the contract. If the contract is incomplete and *ex post* bargaining is prohibitively costly, requiring performance as specified in the agreement will be inefficient on at least some occasions. By, instead, enforcing the contract in a way that corrects such defects, courts will enhance efficiency, first, by increasing the efficiency of performance *ex post* and, second, by reducing the need for transactors to formulate detailed agreements, and hence the cost of contracting, in the first place.

In general, the law and economics literature on contract advises courts to complete incomplete contracts with terms the parties 'would have bargained for' themselves had the costs of anticipating and incorporating provisions for the event at hand been sufficiently low (see Chapters 4400 Implied Terms - Interpretation; 4500 Unforeseen Contingencies - Risk Allocation; and 4600 Remedies). Since what the parties would have bargained for in the absence of imperfections encountered during contract formation is a complete contract, courts are essentially charged with discovering and implementing rules that yield the efficient outcome given the information available to (that is, verifiable by) the court (see Schwartz, 1992a, p. 281).

Overall, law and economics offers a richer characterization of background legal rules and the role of courts in enforcing contracts from which economic theories of contracting could benefit. At the same time, legal scholarship on contracting can be faulted for not being more explicit about the purposes of contracting and the ramifications of contract law for contracting behavior. As Rubin (1996) observes, 'When American legal scholars speak of "contracts" they typically do not mean contracts at all, but rather judicial decisions ... involving disputes about contracts. Contracts themselves, the transactions that create them, and the business decision to comply with them, renegotiate them, or breach them have rarely surfaced in the academic study of [contract]' (as quoted in Williamson, 1996).

5. Relational Contracting

Despite substantial differences in the roles they ascribe to courts, law and economics and economic contract theory operate under the 'legal centralist' assumption that courts perform their assigned functions in 'an informed, sophisticated, and low-cost way' (Williamson, 1983, p. 520). But whereas that function in economic theories of contracting entails enforcing explicit

provisions, law and economics assigns courts the much more demanding responsibility of discovering contracting parties' 'real' intentions and identifying opportunities for and implementing efficiency-enhancing adjustments. As Oliver Williamson (1985b, p. 201) has remarked, 'Judgement based on detailed *ex post* knowledge of the particulars, including an examination of the magnitude of the profitability consequences that accrue, will often be the only way to ascertain whether an adjustment is warranted' (compare Ayres and Gertner, 1989, pp. 116-117; Scott, 1990, pp. 600-601). The prescription that courts fill gaps in incomplete contracts with what the parties would have bargained for effectively presumes that courts possess such knowledge and the expertise to perform the substantive calculations the transactors would themselves have had to make to determine efficient performance.

Law and economics' confidence in the efficacy of court ordering and its emphasis on substantive performance contain a paradox, however: if courts are able to fill gaps accurately and costlessly, why would transactors ever incur the time and expense of drafting definite performance obligations in the first place? Instead, transactors could just indicate a vague intention to transact and let the courts fill in the details thereafter. In a world in which contract formation is costly and adjudication costless, a perfectly indefinite agreement, rather than comprehensive Arrow-Debreu bargains, becomes the ideal contract (see Charny, 1991, pp. 1840-1841). If transactors do specify definite performance obligations, it must be to reduce the cost or inaccuracy of court ordering.

Explicit integration of adjudication costs into the analysis of contracting has two immediate implications for contract design. First, where transactors design contracts to avoid court ordering, the presumption that contract terms define the substantive outcomes the transactors wish to see take place is no longer justified. Transactors might reasonably prefer contract provisions that leave gains from trade unrealized, or that relegate sufficiently worthwhile adjustments to renegotiation or other forms of self help, over terms that specify the efficient course of action but increase the costs or likelihood of litigation. In such circumstances, express terms may have only an indirect, and possibly even a contradictory, relation to the parties' substantive aims (for example, Masten and Snyder, 1993, pp. 60-63).

Second, the existence of judicial imperfections opens the door to conduct designed to contrive cancellation, evade performance, or otherwise force a renegotiation of the existing terms. Unlike moral hazard, which is a passive response to price signals within an existing agreement, such behavior aims to exact a *de jure* modification of terms previously agreed to. Among the tactics available to a party seeking a redistribution of the gains from trade are suing for trivial deviations, 'working to rule,' and withholding relevant information in hopes of inducing breach (see Muris, 1981; Williamson, 1983, p. 526; Goldberg, 1985; Masten, 1988b). Contracts from this perspective do not so

much define the terms of trade as determine the process through which the terms of trade are ultimately arrived at (Macaulay, 1985). As Victor Goldberg (1976, p. 428) has described it, the emphasis shifts from devising 'a detailed specification of the terms of the agreement to a more general statement of the process of adjusting the terms of the agreement over time-the establishment, in effect, of a "constitution" governing the ongoing relationship'.

Inasmuch as both regard contract terms as starting points for future negotiations, relational and incomplete contract theories bear a passing resemblance. The difference, however, is that renegotiation in the relational framework is costly and unilateral preservation of the contract's original terms (including price) is neither certain nor free. An essential element of contract design, therefore, becomes structuring the relationship in a way that reduces the incentive to engage in wasteful efforts to evade performance or force a renegotiation (compare Williamson, 1983; Goldberg, 1985; Klein, 1992, 1995, 1996; Masten, 1988b). Contract terms will also be used to affect the extent of court ordering. Indefinite contracts that use terms such as 'best efforts', 'gross inequity', or 'substantial performance' to describe contractual obligations leave the parameters of acceptable performance ultimately to the courts. By contrast, contracts that specify precise performance obligations, define sanctions (such as liquidated damages or termination), and allocate discretion to invoke those sanctions unilaterally, shift the locus of decision making and adjustment, to the extent courts defer to written terms, from the courts to the transactors.

Finally, a process orientation also highlights the interaction between judicial enforcement policies and contract design. To the extent that deviations between contract terms and transactors' substantive intentions reflect efforts to economize on adjudication costs, judicial efforts to complete 'incomplete' agreements may frustrate rather than foster the parties' intentions. The ability of contracting parties to achieve process objectives - to reduce court ordering through the use of more precise language, for example - depends on the extent to which courts are willing to defer to written terms.

6. Empirical Evidence on Contractual Choice

Several reviews of the empirical literature on contracting have been published, the most recent of which are Shelanski and Klein, 1995; Crocker and Masten, 1996; Lyons, 1996, and Lafontaine and Slade, 1997, 1998. The following identifies some of the most prominent findings and regularities and their relation to the theories discussed above.

6.1 Contracting and Contract Duration

One of the most firmly established regularities in the empirical literature on contracting is the association between relationship-specific investments (or reliance) and the use and duration of contractual agreements. An early and well-known example is Joskow's (1987) econometric analysis of the duration of nearly 300 coal contracts. Exploiting regional differences in the characteristics of coal and transportation alternatives and variations in contract quantity, Joskow's study showed the duration of coal contracts to be significantly correlated with measures of physical- and site-specificity and dedicated assets. A more recent study of engineering subcontracting practices in the United Kingdom by Lyons' (1994) suggests that specificity affects not only the duration of contracts but the decision to contract in the first place. The engineering firms and subcontractors in Lyons' sample were significantly more likely to adopt formal contracts, over more flexible but less secure informal agreements, where investments in relationship-specific physical and human capital left the subcontractor vulnerable to *ex post* opportunism. Empirical research has also identified a correlation between long-term contracting and specificity in natural gas (Crocker and Masten, 1988); petroleum coke (Goldberg and Erickson, 1987); and ocean shipping contracts (Pirrong, 1993), among others.

Contracting appears less attractive as a way of protecting reliance or relationship-specific investments, however, where the alternative to contracting is integrated ownership and production. Empirical research on integration decisions reveals a consistent preference for integration over contracting as the specificity of investments increases (for overviews, see Joskow, 1988; Shelanski and Klein, 1995; Crocker and Masten, 1996; and Chapter 0530 New Institutional Economics). Contracting thus appears to be only an imperfect response to the hazards posed by relationship-specific investments. Empirical research suggests, moreover, that the costs and limitations of contracting grow with the complexity and uncertainty of the transaction. In Lyons' (1994) study of engineering transactions, for example, firms were less likely to use formal contracts for advanced technology projects than for relatively simple procurements. Meanwhile, Goldberg and Erickson (1987) and Crocker and Masten (1988) found that contract duration in petroleum coke and natural gas contracts decreased in periods of increased uncertainty, contrary to what would be expected if risk-sharing were the primary motive for contracting. Research on the determinants of make-or-buy decisions suggests that uncertainty and complexity diminish the attractiveness of contracting relative to integration as well (for example, Masten, 1984; Anderson and Schmittlein, 1984).

Though clearly an important determinant, the protection of specific investments is not the sole motive for contracting. Unsupported assertions to the contrary notwithstanding, relationship-specific investments in franchising appear to be modest and unimportant as a motive for franchise contracting (see

Lafontaine and Slade, 1997, 1998). Indeed, the viability of some contractual arrangements, such as franchising and equipment leasing, may depend on assets actually being redeployable at reasonably low cost (Klein, 1995; Masten and Snyder, 1993). Case studies have also shown benefits of contracting to accrue to the desire to control free-riding on the provision of information or services (for example, Rubin, 1978; Masten and Snyder, 1993) and to avoid unproductive search and sorting costs (Kenney and Klein 1983; Gallick, 1984).

6.2 Contract Design

(a) *Incentive Provisions* The empirical literature offers broad support for the proposition that transactors choose contract terms to promote efficient adaptation and mitigate transaction costs. In contemporaneous studies of natural gas contracting, Masten and Crocker (1985) and Mulherin (1986) found that take-or-pay percentages in natural gas contracts varied with the alternative value of gas reserves, supporting an incentive interpretation over the alternative view that take-or-pay provisions serve distributional or risk-sharing purposes (for example, Hubbard and Weiner, 1986). Case studies describing the use of minimum purchase requirements for coal (Carney, 1978) petroleum coke (Goldberg and Erickson, 1987), and bauxite (Stuckey, 1983), among other products, corroborate this finding (see Masten, 1988a, pp. 91-92, for a discussion). In a related study, Crocker and Masten (1988) found that the prospect of inefficient adaptation associated with distortions in the size of take-or-pay provisions significantly reduced the willingness of parties to engage in long-term contracting.

Incentive considerations also appear to be influential in determining sharing arrangements. Lafontaine (1992), for example, found that royalty rates across franchises tend to vary with the relative importance of franchisor and franchisee effort. Observed correlations between uncertainty and royalty rates (and the use of franchised versus company outlets) are inconsistent with the standard assumption of franchisee risk aversion, however. (Reviews of the empirical literature on franchise contracting can be found in Lafontaine and Slade, 1997, 1998).

Risk sharing as a motive for contracting has fared poorly in other settings as well. Allen and Lueck (1992), for instance, conclude that the incidence of crop-share versus fixed-rent contracts between farmer-tenants and landowners are unrelated to the riskiness of crops. Similarly, Leffler and Rucker (1991) reject risk sharing as an explanation for why timber track owners and harvesters sacrifice the incentive advantages of lump-sum relative to royalty contracts in favor of the hypothesis that the use of royalty contracts on relatively remote and heterogeneous timber tracks reflects the desire to avoid wasteful pre-bid inspection under lump-sum contracts. Finally, Holmstrom and Milgrom (1991) interpret Anderson's (1985) and Anderson and Schmittlein's (1984)

finding that importance of non-selling activities and difficulty measuring performance of sales agents explain manufacturer reliance on low-powered incentives as evidence that measurement costs in multitask settings are a critical determinant of the intensity of incentives in contractual relations (see also, Slade, 1996).

(b) Relational Contracts Whereas most of the empirical contracting literature focuses on standard price and quantity provisions, research on relational contracting has sought to account for the widespread use of contracts that leave important terms like price and quantity indeterminate. Examples of such provisions include price renegotiation and 'market out' provisions in natural gas contracts (Crocker and Masten, 1991), 'gross inequity' provisions in long-term coal contracts (Joskow, 1985), termination-at-will and best-efforts clauses in franchise agreements (Hadfield, 1990), substantial performance requirements in construction contracts (Goetz and Scott, 1981), and other 'open term' agreements (for example, Gergen, 1992).

Large-scale analyses of relational contract provisions have focused on methods of price adjustment. Crocker and Masten (1991), for instance, conclude from their study of price adjustment in natural gas contracts that circumstances favoring the use of long-term, fixed-quantity agreements favor the adoption of relatively indefinite price adjustment provisions over formulaic adjustment mechanisms that, although less costly to implement, are more likely to induce efforts to evade performance obligations in extreme situations. As Goldberg and Erickson (1987) note, greater reliance on renegotiation provisions in fixed versus variable quantity contracts is difficult to reconcile with incentive alignment motives. Crocker and Reynolds' (1993) study of jet engine procurement contracts also found that price adjustment was likely to become less definite as performance horizons lengthened and technological uncertainty increased, while contractor litigiousness and the absence of alternative engine suppliers favored more definite price terms. The available evidence thus generally supports the notion that transactors' choice of contract terms reflects a tradeoff between the specification costs and rigidities associated with specifying detailed performance obligations in uncertain or complex transactions, on the one hand, and the greater flexibility but higher expected cost of establishing the terms of trade *ex post* in less definite relational contracts.

7. Implications and Directions

Economic research on contracting is important to both legal scholarship and practice. Contracting is a - perhaps the most - fundamental institution of legal as well as economic interaction (compare Williamson, 1996). At a practical level, the study of contracting stands to inform lawyers and lawmakers about

the objectives of contracting parties and the sources of contractual failures. For lawyers, such knowledge can provide insights with which to help clients design more effective agreements. For legislatures and courts, understanding the functions and limitations of contracting is crucial to the formulation of appropriate legal rules and their application in individual cases. As noted previously, whether and how courts intervene in contractual relations will depend on the theory of contracting behavior to which they subscribe. Theories that place confidence in the ability of parties to effect private orderings either through *ex ante* specification of contingent performance or through low-cost, *ex post* negotiation will favor a policy of passive judicial enforcement, whereas theories that emphasize the behavioral and cognitive impediments to *ex ante* alignment and *ex post* negotiation without similar regard for the cognitive limitations of judges will tend to favor more active enforcement and intervention by the courts.

As various commentators have noted, official contract law, as reflected in the United States in Section 2 of the Uniform Commercial Code and Restatement (2nd) of Contracts, has moved increasingly toward favoring more active judicial enforcement. Where once courts were discouraged from using extrinsic evidence in interpreting contractual obligations, modern contract law endorses an active enforcement policy, encouraging courts to interpret contractual agreements 'in light of surrounding circumstances'. Despite this widely-noted shift, however, the evidence is that courts have been far from uniform in their approach to contract enforcement. In practice, courts as a group neither universally seek to discover the parties' true intentions from the context of their agreement - as the Code and Restatement recommend - nor consistently defer to written terms (Goetz and Scott, 1985, p. 307; Schwartz, 1992a). Such variations, moreover, cannot be explained entirely by philosophical differences among courts; judicial enforcement policies appear to vary systematically across disputes, courts tending to enforce franchise and distributorship agreements more passively than contracts for intermediate goods between manufacturers and suppliers (see Hadfield, 1990, pp. 978-990; Schwartz, 1992a, pp. 271, 304-305; Farnsworth, 1990, p. 556). Further research on variations in judicial enforcement policies and the dimensions along which they vary is likely to shed additional light on the functions and limitations of contracting.

Although there are indications that recent research on contractual choice has already begun to influence how courts think about contracting and resolve contract disputes (see, for instance, *PSI Energy v. Exxon Coal, USA*, 991 F.2d 1265 (1993)), much more needs to be done before positive theories of contracting can provide a solid basis for normative prescriptions. Such basic questions as why transactors choose super-compensatory liquidated damages have yet to receive a fully satisfactory explanation. More subtle but important issues like the effects of contractual protections on the willingness of

transactors to make relationship-specific investments are just beginning to receive scrutiny (for example, Saussier, 1998). Although theoretical tensions are likely to persist between those who value axiomatic rigor and those willing to invoke empirical regularities to develop testable predictions, on one issue at least, the two approaches appear to be converging, namely, that further progress on understanding contracting requires a better appreciation of the interactions of contract design and contract enforcement and the process functions of contracting (compare Tirole, 1994).

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