The Law and Economics of Costly Contracting

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1. Introduction.

Contract theory models commonly assume that it is costless to write a contract, costless to play a contractual mechanism and costless to renegotiate. These "contracting costs" obviously are positive in real life. The standard treatment of them in the models thus apparently follows from the premise that contracting costs are of second order importance. Recent scholarship showing how efficiency is significantly reduced when transaction costs are introduced into standard bargaining and contract models suggests that this premise should be rethought.[1] This paper thus asks whether and how naturally occurring and legally created contracting costs affect the ability of parties to contract efficiently about relation specific investment.

1.1 The current legal and economic understanding regarding contracting costs.

The law's goal is to facilitate a court's ability to ascertain and implement the parties' intentions regarding the transaction at issue. Formalism — an almost exclusive focus on the written words, read with their dictionary meanings — now is thought to be at odds with this goal. The current legal view implies:

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[1]See, e.g., Anderlini and Felli (2001); Battigalli and Maggi (2000). The law and economics literature on default rules implicitly considers contracting costs; for it argues that the state should provide legal rules that will serve as contract terms when contracting costs altogether prevent terms from being written. This literature, however, does not consider how contracting costs affect the contracts that parties do write. The latter is our subject.

(a) *Contextual interpretation*: A court's search for intent should reach beyond the written words to include evidence of what parties said and did during the course of their negotiations. A corollary of this implication holds that courts should be reluctant fully to credit party efforts in their writing to limit reference to pre-contractual evidence.

(b) *Relaxed requirements of specificity*: If a court finds that parties intended to contract but their writing does not settle relevant details, the court fills in the blanks with default legal terms, customary terms in the parties' industry (if any exist) or "reasonable" clauses. The Uniform Commercial Code (the "UCC") authorizes a court to fill such gaps as the lack of a price, a specified time for delivery, or a specified product quality.

(c) *The relevance of past and current practice to interpretation*: A court should consider actions under prior contracts between the parties or actions after the current contract was made when deciding what obligations the current contract imposes. For example, a buyer's practice of accepting nonconforming deliveries under prior contracts may persuade a court to restrict the buyer's ability to reject under the current contract.

(d) *A preference for modifications*: The parties' latest expression of intent is preferred to earlier expressions because courts should implement what parties want, not what they once wanted, and also because later intentions are likely to be better informed than earlier ones. This view sustains the rule that a term in the initial agreement prohibiting renegotiation is unenforceable.[2]

These four implications best follow from an autonomy view of contract. On this view, contract law rules should require, or aid, a broad judicial search for parties' actual intent; it is a party's consent to be bound that legitimates the exercise of state coercion requiring the party to perform or pay damages.

The legal implications just summarized influence contracting costs. As an example, under current law the evidentiary base for interpreting the written contract includes prior oral and written communications and actions (Implications (a) and (c)). When the evidentiary base is this broad, parties

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[2]See Snyder (1999).

may be unable to predict just which of their words or actions a court later would find decisive when attaching meaning to contested terms. The parties may respond to this uncertainty either by making the writing as explicit as possible, or by using a more simple contract. The former response increases contracting cost; the latter may reduce contracting utility. Put more broadly, the net surplus from deals may fall in the seriousness of the courts' search for parties' actual intent.

The economic view regarding contracting costs follows from a commitment to efficiency. In the economic view, the costs of writing the initial contract ideally should be zero. When it is costless to contract, and also (relatively) costless to observe relevant actions and later states of the world, parties can write a complete state-contingent contract, prescribing the optimal action for each of them to take in every possible future state. When it is costless to contract, but costly to observe future actions and states, parties can write a contractual mechanism that will induce truthful revelation of relevant information when uncertainty is resolved. Assuming judicial enforcement of mechanisms that require parties to send messages[3], this contract form replicates the outcome of any ex post renegotiation; hence, it specifies efficient outcomes in equilibrium. An implicit premise of the economic view, then, is that when contracting is costless, parties always will write the contract that best implements their intentions.

The economic approach diverges from the legal approach in two important ways. First, the legal view ignores the effect of the interpretive practices just described on contracting costs. No economic approach would ignore costs. Second, the current economic approach implies that when

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[3]A message can be "Trade four units" or "Pay $5 per unit" or the like.

contracting is cheap, renegotiation should be costly. This is because a party would want to renegotiate a complete state-contingent contract or an efficient mechanism only for strategic reasons — to exploit a contract partner who has made a sunk cost investment. In complete contrast to the legal view, the economic approach thus implies that courts should ban recontracting or, at the least, enforce contractual bans on renegotiation.[4]

1.2 This paper's analysis.

This paper uses a standard efficiency framework to address the canonical problem of when parties can efficiently implement relation specific investment and efficient ex post trade. Efficiency is the goal here because the problem we analyze commonly faces firms. Firms are artificial legal entities, so a normative theory whose goal is to protect the autonomy of actual persons appears out of place.[5] The model set out below differs from the usual contract theory model, however, because it lets initial and renegotiation costs exceed zero.

Contract theory considers four contract forms: (i) a complete mechanism, which we denote a "coordinated message contract"; (ii) a complete state-contingent contract (which presupposes the

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[4]A contractual ban on renegotiation is convenient to enforce when the trading opportunity expires before the court intervenes. In this circumstance, the court's only role is to order the monetary transfers that the contract requires. An enforceable no-renegotiation clause then would authorize the court to reinstate the monetary transfers that the original contract required, and one of the parties always will request this relief. As a result, a party's affirmative response to a request for modification would not be credible, implying that the request would not be made. In the standard mechanism design context, in which the court is asked to intervene before parties trade, a contractual renegotiation ban would permit a party later to ask the court to reinstate the transfers that the parties would have made had they sent the messages the original contract required. Again, at least one party would have an incentive, after trade, to petition for these transfers.

[5]Part 5.2 develops further the theme that the regulation of contracts between firms should differ from the regulation of contracts between individual persons.

ability of parties to verify the ex post state); (iii) a one sided option contract (one or the other party has an option to trade at contracted prices, or not trade); (iv) a simple, noncontingent contract to trade a specified quantity at a certain price.

We show here that parties write coordinated message contracts under low contracting costs. Then, as just said, they want renegotiation to be costly. If it is expensive to create a mechanism, but relatively inexpensive to contract on the ex post state and verify that state to a court, then parties write state-contingent contracts; and again, they prefer barriers to renegotiation. Creating either of these sophisticated contracts in a world of positive contracting costs can cost more than a transaction would yield the parties, however. In this event, parties often will write simple noncontingent contracts. The legal rules that regulate contract interpretation can raise contracting costs. Therefore, a likely effect of these rules, we show, is to cause parties sometimes to shift from sophisticated efficient contract forms to simple less efficient contract forms. This effect of current legal interpretive practice has been overlooked.

A simple noncontingent contract will be suboptimal to perform in some states of the world. The parties to it thus know that renegotiation may be necessary to realize surplus, and this implies a party preference for low renegotiation costs. We extend this result to show that, when parties use a simple noncontingent contract and investment is "cooperative",[6] parties require renegotiation to give the

[6]A cooperative investment directly benefits the noninvesting party. For example, the seller's investment increases the value of performance to the buyer. The seller could be motivated to make such an investment, when it is efficient, by giving the seller an appropriate share of the resultant marginal increase in surplus. De Fraja (2000) and Che and Hausch (1999) argue that cooperative investment is common.

investing party a sufficient share of the contractual surplus to motivate its taking the efficient action. In addition, when initial contracting costs take "intermediate" values, parties may use one sided option contracts. Under these contracts, in contrast to the simple contract form just discussed, parties will want to burn some ex post surplus in the event of renegotiation in order to maintain efficient investment incentives. However, efficient investment produces high value only stochastically (in the model), so that parties to option contracts renegotiate with positive probability; and this causes them to prefer recontracting costs that are low enough not to exhaust the ex post surplus fully. Thus, the existence of intermediate initial contracting costs often implies a party preference for intermediate recontracting costs. We summarize these results with the remark that the pure economic view of renegotiation (that it be as costly as possible), and the pure legal view of renegotiation (that it be as cheap as possible), actually apply to different subsets of the contractual space.

We also explore the positive and normative implications of the analysis. To get a flavor of the former, our results imply, among other things, that parties who face high initial contracting costs should prefer low renegotiation costs; and that parties sometimes will write contracts that *require* renegotiation. Impressionistic evidence is consistent with these predictions. Regarding what is perhaps our most important normative implication, modern transactional law affords parties a much wider scope to contract over substantive issues than to contract over the rules of the game. Thus, parties generally are free to set prices and quantities, but they are much less free to restrict renegotiation or to restrict the evidentiary base that courts use to interpret contracts. Parties, however, not only have preferences over substantive terms; they also have preferences over the rules of the game, such as how easy or hard it should be to renegotiate. Preferences over the rules, our model shows, can be as parameter specific

as preferences over the substantive terms. This implies that the freedom to contract, at least for business parties, should extend more to the rules of the game than it now does.[7]

Part 2 below sets out the model. Part 3 derives the results summarized above. Part 4 presents an example that shows how the analysis applies to concrete cases. Part 5 discusses positive and normative implications of the analysis in more detail and Part 6 concludes.

2. The Model.

We analyze a straightforward extension of the standard model of mechanism design with renegotiation; our extension explicitly takes the costs of contracting and recontracting into account. In our model, the seller makes a private, unverifiable investment that influences a random variable. This variable, in turn, influences the (unverifiable) value the buyer can realize from trade. Both parties observe the draw of the random variable. Afterwards, the parties decide whether and how to trade. Trading decisions are verifiable and thus can be imposed by an external enforcement authority (the court), who acts to implement the parties' contract.[8] Contractual mechanisms prescribe trading outcomes as functions of information the court can access.[9] Contracting and renegotiation are costly,

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[7]This result is consistent with an implication of the mechanism design literature, that the court's role should be restricted to enforcing the mechanisms that parties specify. Eggleston, Posner and Zeckhauser (2001) also suggest, consistently with our analysis, that courts should obey interpretative instructions that parties give them.

[8]In Anderlini, Felli and Postlewaite (2001), the court maximizes expected ex ante gains from contracting. Our court plays a more passive role because in our analysis, unlike in theirs, performance under some type of contract always is ex post efficient.

[9]This is the "complete contract" approach in the sense that mechanisms are permitted, but it is the "incomplete contract" approach in the sense that contracting entails a cost. Tirole (1999) discusses these approaches in the contract theory literature. An accessible review is Schmitz (2001).

but parties can influence these costs by their choice of contractual form.

2.1 Model details.

The relationship between the buyer and seller takes places over five time periods:

Time 1: The parties make a contract, denoted *f*, with two components. The externally enforced component specifies a mechanism that the parties are to play at time 4. The outcome of the mechanism is a tuple (*d*, *p*, *s*), as explained below. The self-enforced component specifies an equilibrium of the mechanism (for each contingency) on which the parties coordinate. A contract *f* costs $\phi(f)$ to write.

Time 2: The seller makes an unverifiable and private investment decision x, that is chosen from a finite set X at an immediate cost of $F(x)$. The buyer does not observe x.

Time 3: A random event determines the *state of the relationship* θ, which is an element of a finite set Θ. The distribution of states partly depends on the seller's investment choice. The probability that state θ occurs is denoted $q(\theta, x)$. The value the buyer places on trade and the cost of trade are partly a function of the ex post realized state, which the parties observe at this time.

Time 4: The parties play the mechanism their contract specifies. The outcome of the mechanism is a joint *trade decision d*, a price *p*, and a recontracting parameter *s*. The decision *d* is an element of a finite set *D*, and is partly a function of θ. Thus, in some ex post states it may be efficient to trade in a certain way while in other states the same trading decision would be inefficient. The price *p* is a transfer from the buyer to the seller.

Time 5: The parties may recontract to change the outcome of the mechanism. The disagreement point for renegotiation is the outcome that the mechanism specifies. The recontracting

parameter *s* specifies the share of the gains from recontracting that transaction costs do not exhaust. We assume *s* 0 [0,1]. For example, if *s* = ½, then renegotiation dissipates one half of the contractual surplus. The outcome of recontracting is a new trade decision *d'* and a new price *p'*.

The parties' payoffs depend on the state, the seller's investment, the trade decision and price, and the costs of contracting and recontracting. Let *v*(*d*, 2) be the buyer's value from trade, and c(d,2) be the seller's cost of producing the traded goods. If the time 4 decision, *d*, specifies "no trade," then *v*(*d*, 2) = 0 and c(d,2) # 0.[10] Payoffs are linear in the price transfer. Thus, the buyer's payoff from trade is *v*(*d*, 2) – *p*, and the seller's payoff is *p* – *c*(*d*, 2). The *ex post optimal trade decision* in state 2, denoted *d**(2), maximizes the joint value of the trading decision, *v*(*d*, 2) – *c*(*d*, 2), by the choice of *d*. We assume that *d**(2) is unique for each state 2, and make the following

Assumption A: For each *x*, there exist at least two states 2, 2' 0 1 such that *d**(2) ... *d**(2') and *q*(2, *x*), *q*(2', *x*) > 0.

Assumption A requires that at least two different trading decisions will be optimal with positive probability, no matter the level of investment the seller chooses.

At time 5, parties renegotiate to *d**(2) if the mechanism would yield a suboptimal decision *d* ... *d**(2). The *renegotiation surplus* is given by

$$r(d, 2) / [v(d^*(2), 2) - c(d^*(2), 2)] - [v(d, 2) - c(d, 2)].$$

The first bracketed term on the right hand side is the gain from making the optimal trading decision; the

[10] It is possible to have *c*(*d*, 2) < 0 because the seller could incur a "negative cost" from selling the intermediate good to another party on the spot market.

second bracketed term is the *lower* gain that would have been realized had the parties allowed the outcome of the mechanism to stand. There is no gain from recontracting when the mechanism specifies the efficient outcome $d^*(\theta)$; then $r(d^*(\theta),\theta) = 0$.

Uncertainty is resolved by time 4, so the renegotiated contract that replaces the original contract always takes the simple noncontingent form, specifying a price p' and a trade decision d'. It must be that $d' = d^*(\theta)$, and parties choose p' to divide the fraction s of the renegotiation surplus $r(d^*, \theta)$ that remains after recontracting costs are incurred. We normalize the cost of writing a simple noncontingent contract to zero. Therefore, renegotiation is costly only when the renegotiation friction parameter $s < 1$.

Renegotiation is resolved according to the generalized Nash bargaining solution with fixed bargaining weights β_B and β_S for the buyer and seller, respectively. Thus, in state θ, if the outcome of the parties' initial contract is (d, p, s), then from time 5 the buyer obtains

$$z_B(d, p, s, \theta) \equiv v(d, \theta) - p + s\beta_B\, r(d, \theta)$$

and the seller obtains

$$z_S(d, p, s, \theta) \equiv p - c(d, \theta) + s\beta_S\, r(d, \theta).$$

The parties' total payoffs are these amounts minus the seller's investment cost $\phi(x)$ and the initial contracting cost $\psi(f)$. How the parties split $\psi(f)$ does not affect the analysis.

The mechanism played at time 4 is static: Each party sends a message to the court, which then prescribes the outcome (d, p, s) that the contract dictates given these messages. Let M_B denote the buyer's message space and let M_S denote the seller's message space. In addition to sending unrestricted messages, the parties also can directly verify none, some, or all aspects of the ex post state

to the court. M_D denotes the set of variables that the parties can verify.

The model collapses verification costs into initial contracting costs for convenience. We suppose that $M_D = \Omega$, so that the court can process information that directly reveals the ex post state. Courts, however, only know what parties are able to prove. This institutional fact implies that when parties cannot verify the state to the court, any contract f that conditions directly on Ω would have a cost $\psi(f) = \infty$ to create; that is, f cannot be written. This modeling strategy also permits analysis of cases when parties make the state verifiable by installing a monitoring technology. In such cases, a contract f that conditions directly on Ω would cost $\psi(f)$ to write, where $\psi(f)$ includes the cost of the technology.[11]

A message profile is denoted $m = (m_B, m_S, m_D)$, where m_B is the buyer's message, m_S is the seller's message, and $m_D = \Omega$ is what the court can directly verify. For any message profile m, the parties' initial contract prescribes the outcome $(d^f(m), p^f(m), s^f(m))$. Thus, from time 5 in state Ω, the parties receive the payoffs given by

$$z_B(d^f(m), p^f(m), s^f(m), \Omega) \text{ and } z_S(d^f(m), p^f(m), s^f(m), \Omega).$$

These payoffs, along with the messages spaces, define a game the parties play at time 4. We assume that a Nash equilibrium is played in each state and that, if there is more than one Nash equilibrium in any given state, the parties' initial contract specifies the Nash equilibrium on which they coordinate.[12]

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[11]We do not consider the ex post costs or strategic aspects of evidence disclosure. For research on these, see Bull and Watson (2001) and Bull (2001).

[12]Existence of equilibrium is assured because Ω is finite. However, it is generally not the case that, for a given state, any two equilibria of the message game are equivalent (yield the same payoffs). Equivalence holds in models with free renegotiation (see Segal and Whinston (2001), for example), but may not hold here because renegotiation is costly. We do not allow the contract to specify arbitrary

By the revelation principle, we can restrict attention to direct revelation mechanisms and equilibria with truthful reporting. Thus, we assume that $M_B = M_S = \theta$ and look for equilibria in which, in state θ, the parties actually report that θ is indeed the state. Letting $m_B(\theta)$ and $m_S(\theta)$ denote the messages sent by the parties in state θ, truthful reporting means $m_B(\theta) = m_S(\theta) = \theta$ for each state. Thus, in state θ, the equilibrium message profile is $m(\theta) = (\theta, \theta, \theta)$. To establish an equilibrium with truthful reporting, we must analyze what would happen if players unilaterally deviate, leading to such message profiles as $(\theta', \theta, \theta)$ or $(\theta, \theta', \theta)$.

Let $u_B(x \mid f)$ and $u_S(x \mid f)$ denote the parties' expected payoffs from time 3, under contract f and investment level x.

$$u_i(x \mid f) \equiv \sum_{\theta} q(\theta, x)\, z_i(d^f(m(\theta)), p^f(m(\theta)), s^f(m(\theta)), \theta),$$

for i = B,S, where the summation is taken over θ. Given a contract f and anticipating behavior at times 4 and 5, the seller chooses the investment level at time 2 that maximizes her payoff. This is the x^f that maximizes

$$u_S(x \mid f) - \Psi(x).$$

Note that x^f may differ from the first-best level of investment x^*, which maximizes

$$\sum_{\theta} q(\theta, x)[v(d^*(\theta), \theta) - c(d^*(\theta), \theta)] - \Psi(x),$$

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randomization over the outcomes (other than by using the state) for three reasons. First, randomization schemes can be costly to set up; implicitly, we are assuming that the set up costs are prohibitively large. Second, with positive contracting costs, detailed randomization schemes may be of little use. Third, the law also imposes constraints. For example, the rule in UCC §2-716 that conditions a court's ability to award specific performance on the occurrence of "proper circumstances" may prevent parties from conditioning outcomes on random events that a court would consider irrelevant to the contractual relationship.

where the summation is taken over Ω. At time 1, the parties select the initial contract f^* that maximizes the joint value of their relationship which, as a function of their contract f, is

$$u_B(x^f \mid f) + u_S(x^f \mid f) - \Phi(x^f) - \Psi(f).$$

2.2 Contracting costs: interpretation and assumptions.

Contracting and recontracting costs are captured by the function Ψ and the variable s. The former gives the cost of writing an initial contract f, which generally comprises intrinsic elements as well as elements that the law influences. The variable s represents recontracting costs that partly occur naturally but also are a function of the parties' contract and the legal rules. Complex contracts — those having a greater number of clauses or requiring a court to evaluate information from many different sources — are assumed to be more expensive to write. To capture this simple idea and to offer a more detailed interpretation of the contract cost function Ψ, we follow Battigalli and Maggi (2000). In their analysis, a contract is a series of clauses linking combinations of various possible "inputs" (that Battigalli and Maggi call *elementary events*) to prescriptions of behavior (that Battigalli and Maggi call *elementary actions*). In our model, the inputs are message profiles; the prescriptions are the possible outcomes of the mechanism, (d, p, s). For example, individual elementary events are: $m_B = \omega$ ("the buyer sends message ω"); $m_S \neq \omega$ ("the seller does not send message ω"); and $m_D = \omega$ ("the court verifies that the state is ω").

We need not focus on the technology of clause writing, but it is helpful to isolate certain components of contract creation costs on which the model depends.[13] There is a cost Ψ_B associated

[13]Battagilli and Maggi (2000) associate a cost with each separate instance in which the contract refers to an elementary event or action. Further, they differentiate between the cost of the initial

with creating the ability to send message m_B; a cost ε_S associated with creating the ability to send message m_S; and a cost ε_D associated with creating the ability to send message m_D that directly verifies the ex post state. These costs may result from the time or effort required to establish a "message channel", or to provide information or send instructions to the court, or to install a monitoring technology. A cost ε_i is *not* paid if and only if the functions d^f, p^f, and s^f are *all* constant in m_i — that is, if the trading and pricing decisions and the renegotiation parameter do not depend on the message from channel i.[14] Parties also incur a contracting cost κ in order to specify a value of the renegotiation parameter s that differs from the default parameter $\underline{s}$.[15]

The costs ε_B, ε_S, ε_D and κ relate to the "stark" aspects of contracts — whether the outcome is contingent on messages and whether the contract affects the renegotiation parameter. To see what is meant by "stark", consider a contract that specifies trade of five units if and only if the buyer sends the message "The state is H; send five units;" otherwise, the contract specifies no trade. We let ε_B be the cost of sending such a single buyer message; hence, this contract costs ε_B to write. The parties could write a more complicated contract that also conditions only on buyer messages. Such a contract could

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reference and the cost of later references. In our model, any contract f with externally enforced components d^f, p^f, and s^f, can be analyzed by considering the cost of creating a series of clauses that represent f. Parties are assumed to use the most efficient language possible; that is, parties choose clauses that minimize the cost of creating their contract f.

[14]This is the formal reasoning underlying our assumption that it is costless to write a simple noncontingent contract, which does not require messages or verification.

[15]In some of what follows, we assume that parties can choose the renegotiation parameter freely, but this choice actually is subject to two constraints: (i) some recontracting costs may be exogenous; and (ii) the legal rules may restrict the parties' freedom. Part 5 discusses the second constraint.

recite: "The buyer takes twelve units if he announces that the state is H; the buyer takes five units if he announces that the state is L; there is no trade if the buyer sends any other message (or none)". Parties would incur a cost greater than ε_B to write this more complicated contract because the contract partitions the buyer's message space more finely. Contracting costs not captured by ε_B, ε_S, ε_D, and γ are denoted "complexity costs". We do not analyze complexity costs in detail, but do make one simplifying assumption about the contracting cost structure:

Assumption B: It is costless to specify an *outcome* (d, p, s).

We group the set of possible contracts that parties can write into four contract forms:

Simple noncontingent: Under this contract, the functions d^f, p^f, and s^f are constant: The trade decision, price, and recontracting parameter do not depend on messages. A simple noncontingent contract costs $\varepsilon(f) = 0$ to write if $s^f = \underline{s}$, and costs $\varepsilon(f) = \gamma$ if $s^f \neq \underline{s}$.

Verified contingency. A verified contingency contract prescribes a trading outcome that is conditioned only on verifiable evidence regarding the realized state, not on the parties' messages. Parties must incur ε_D to create this contract form. Parties also incur γ if $s^f \neq \underline{s}$ is specified in at least one contingency, and will incur complexity costs if they contract on several ex post states.

Options. The outcome under an option contract is a function of either the buyer's message or the seller's message, but not both. An option contract, gives a party the option of trading at the specified prices or renegotiating. In the buyer-option case, contracting costs thus comprise ε_B, ε_D (if the contract requires the court to verify a datum directly), γ (if parties vary the default renegotiation parameter), and possibly complexity costs.

Coordinated message. The outcome depends on the messages of both the buyer and the seller. Contracting costs must include $\varepsilon_B + \varepsilon_S$, and may also include ε_D, γ, and complexity costs.

On our assumptions, simple noncontingent contracts are the least costly to write and coordinated message contracts are the most costly.

3. Results.

The standard "renegotiation-proofness principle" treats renegotiation as a *constraint* on contracting. Under the principle, parties can emulate the outcome of any ex post renegotiation with an appropriately designed mechanism (that specifies efficient outcomes in equilibrium). Because parties can achieve with a contractual mechanism everything they can achieve with ex post renegotiation, parties are assumed to prefer infinite renegotiation costs. The renegotiation-proofness principle does not necessarily hold under costly contracting, however, because emulating renegotiation may require a sophisticated mechanism that would be too expensive to construct and implement.[16] That renegotiation itself may be optimal in some contract scheme when contracting and recontracting costs are positive raises the question just how these costs affect the parties' ability to achieve desired outcomes with particular contractual forms. In attempting to answer this question, we make the simplifying

Assumption C: Complexity costs are zero; that is, all contracting costs are summarized by the variables $"_B$, $"_S$, $"_D$ and $($.[17]

Our first result shows that parties prefer very high renegotiation costs when they use coordinated message contracts (the most complicated form). These contracts must deter parties from

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[16]Further, the principle does not hold when there are renegotiation costs, as Brennan and Watson (2001) show.

[17]The Appendix proves that versions of the results in the text hold for the more general setting in which Assumption C is relaxed.

dishonestly reporting the ex post state. This opportunity is heightened when parties can renegotiate. Verified contingency contracts also are adversely affected by renegotiation because they too yield efficient trade decisions and investment if courts enforce them as written. We summarize this logic in

Proposition 1. If it is optimal for parties to use either a coordinated message contract or a verified contingency contract and to specify $s^{f*}(m) \geq \underline{s}$ for some message profile m, then there is an optimal contract f^* (of the same form) that specifies $s^{f*}(m) = 0$ for all m. Further, $d^{f*}(2, 2, 2) = d^*(2)$ for each state 2.

The first sentence in Proposition 1 holds that parties to the specified contracts would prefer renegotiation to be infinitely costly. The second sentence says that this preference is held because f^* prescribes the ex post optimal trading decision for each state. Regarding notation, recall that the equilibrium message profile is (2, 2, 2) in state 2.[18]

Our next result addresses the contractual form on the other side of the complexity spectrum: the simple noncontingent contract. Because this contract form is constant in the message profile, the contracted outcome can be described without the m argument.

Proposition 2. If the optimal contract f^* takes the simple noncontingent form, then the following conclusions hold generically.[19] If $s^{f*} \geq \underline{s}$ then $s^{f*} > 0$. Further, the parties will adjust the renegotiation parameter (setting $s^{f*} \geq \underline{s}$) if $($ is sufficiently small.

Proposition 2 holds that parties to simple noncontingent contracts want the renegotiation surplus to exceed zero. As will be illustrated in the example in Part 4, the investing party must anticipate receiving sufficient surplus or it will not invest.

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[18] This and the following Propositions are proved in the Appendix.

[19] By "generically," we mean that the conclusion may fail to hold only in special knife-edge cases of the contracting environment. See the proof of the proposition for elaboration.

We denote a contractual relationship as having *pure cooperative investment* — when $c(d,2)$ is constant in 2 (so that the seller's investment only affects the buyer's value of trade). We have for this case

Proposition 2': In a setting of pure cooperative investment, there is a function $B(x, d)$ with the following property: If parties use a simple noncontingent contract specifying d' and s', and the contract induces the seller to invest x', then it must be that s' is bounded from below by $B(x',d')$. Further, unless x' minimizes $F(x)$, $B(x', d') > 0$. Finally, if x' is the highest cost investment (it maximizes $F(x)$) and $s' \geq \underline{s}$, then it is optimal to have $s' = 1$.

Proposition 2' holds that when investment is purely cooperative and parties use simple, noncontingent contracts, parties never prefer renegotiation to be infinitely costly; and sometimes prefer it to be costless. Regarding the intuition, cooperative investment directly benefits the buyer, so the seller must be directly motivated to invest. Since the investment outcome is stochastic, simple noncontingent contracts are renegotiated with positive probability, which implies that renegotiation serves the dual purpose of achieving ex post efficiency and ensuring the seller enough surplus to invest efficiently.

Propositions 1, 2 and 2' together show: Parties prefer moderate to low renegotiation costs when they use simple noncontingent contracts. In this event, parties would not impose high barriers to renegotiation if they could control the recontracting parameter. On the other hand, parties prefer very high renegotiation costs when they use the more complex verified contingency or coordinated message contracts. Parties to these contracts would ban renegotiation (set $s = 0$) if law and the technology permitted.

The parties' preferences over renegotiation when they use one-sided option contracts depend on the nature of their investment. In the setting of *pure self investment*, where $v(d, 2)$ is constant in 2, a seller-option contract with $s > 0$ will induce the first-best level of investment x^*. However, with

cooperative investment, the optimal option contract generally specifies $s > 0$, as the example in Part 4 will demonstrate.

Turning to the contracting stage, Proposition 3 relates initial contracting costs to contractual form when these costs are sufficiently low to enable parties to use more sophisticated contractual forms.

Proposition 3. Suppose that the optimal investment x^* cannot be supported using option contracts even when contracting is costless. (a) Fixing the other parameters at positive levels, if ε_D is sufficiently small then parties optimally write verified contingency contracts. (b) If parameters ε_B, ε_S, and γ are small relative to ε_D, then parties optimally write coordinated message contracts.

To summarize, high initial contracting costs lead partes to choose simple contracts, and in consequence to have a preference for moderate or low recontracting cost. Low initial contracting costs yield more sophisticated contractual forms and a party preference for high barriers to renegotiation. Parties always would prefer the State to set $\underline{s}$ at the level that the parties themselves would choose because then they could avoid paying γ. This default rule approach to recontracting would be difficult to implement in practice, however, because the optimal $\underline{s}$ varies with the contractual form that parties choose and the particular parameters of their deal.

4. An Example.

The relationships among the variables our Propositions identify are clarified with a simple example. In it, there are two possible ex post states, three possible trade decisions, and the seller can choose one of two investment levels. To be precise, $\theta \in \{H, L\}$; $D \in \{d^H, d^L, d^0\}$; and $X \in \{h, l\}$, where h is the high investment level and l the low investment level. Assume that $c(d, \theta) = 0$ for each d and each θ, so that the seller can only incur the unverifiable investment cost x. The buyer's value $v(d, \theta)$ is given by the following table:

	d^H	d^L	d^0
H	60	20	0
L	0	20	0

Let q(H, h) = ½ be the probability of state H occurring when the seller chooses x = h, and q(H, l) = 0 be the probability of state H occurring when the seller chooses x = l. The parties are assumed to have equal bargaining weights: $\beta_B = \beta_S = 1/2$.

The parties can trade a specialized good (d^H), a standard good (d^L), or neither good (d^0). The standard good is worth 20 to the buyer. If the seller makes the low investment l, then the specialized good is valueless to the buyer. If the seller makes the high investment then, with probability ½ the specialized good is worth 60 (this is state H), and with probability ½ it is worth 20 (this is state L). Note that d^*(H) = d^H and d^*(L) = d^L. Let the seller's cost of choosing x = l be zero, and assume that ϕ(h) < (60 – 20)/2, or ϕ(h) < 20. This implies that it is ex ante efficient for the seller to select h. The *efficient joint value* is

$$(½)(60) + (½)(20) - \phi(h) = 40 - \phi(h)$$

There is a simple noncontingent contract that would allow the parties in this example to achieve a joint value of at least 20. To see how, begin with a sample contract that specifies $d = d^L$, p = 0, and $s = \underline{s}$. If the seller chooses x = l, then state L is realized with certainty; the parties do not renegotiate; the buyer receives 20; and the seller earns zero. The seller would choose x = h under this contract if his expected gain from renegotiation in state H exceeds his investment cost; and the parties would then obtain an expected joint value that exceeds 20. This contract achieves a value of 20 or more because,

recall, simple noncontingent contracts are costless to write.

The issue is whether parties can realize greater joint gains under other contracts, including the sophisticated ones. In analyzing this issue, we assume that $\gamma = 0$ (the parties can choose any recontracting parameter). This simplifying assumption permits us to focus on initial contracting costs, and also easily to observe party preferences over recontracting costs.

Simple noncontingent contracts. A contract specifying d^H will not give the seller the incentive to invest (because ex post renegotiation favors L). Contracts specifying either d^L or d^0 can motivate efficient investment, and equally as well. Consider a contract specifying d^L at price p. Under this contract, the seller will receive p if he invests at level l, because then L occurs and the contract is not renegotiated. If the seller invests h, then with probability 1/2 the state is H, in which case the parties will renegotiate to d^H, and the seller would receive $p + (1/2)s(60 - 20)$ from time 5. With probability 1/2, the state is L so the seller who chooses x = h receives just p. Thus, the seller will choose h if and only if

$$p + (½)(½)s(60 - 20) - F(h) \geq p,$$

which simplifies to $F(h) \leq 10s$.

This aspect of the example shows that, under a simple, noncontingent contract, low renegotiation costs have two virtues; they increase net ex post surplus and they create efficient investment incentives. Regarding investment, observe that the condition for high investment is easiest to satisfy when $s = 1$. The parties can specify this under the current assumption that $\gamma = 0$. Then, because initial contracting costs are zero under simple, noncontingent contracts, if $F(h) < 10$, the contract in the example yields the expected efficient joint value,

$$(½)(60) + (½)(20) - F(h) = 40 - F(h).$$

Verified contingency contracts. This contract form can support investment level h and the ex post optimal trading decision in each state. To see how, consider a contract that prescribes d^H at a price of 60 in state H, and d^L at a price of 20 in state L. The seller thus obtains all surplus in both ex post states; this has a net expected value of 20, so the seller will invest h.[20] The recontracting parameter *s* has no effect because this contract form prescribes the efficient trade decision for each state. Under a verified contingency contract, the parties receive a joint value of

$$(½)(60) + (½)(20) - F(h) - \phi_D = 40 - F(h) - \phi_D.$$

The simple noncontingent contract does better, yielding a joint value of $40 - F(h)$ when it is relatively inexpensive to invest ($F(h) \# 10$) and renegotiation is costless ($\phi = 0$ so the parties can set $s = 1$), because verified contingency contracts are costly to write. Parties would use them, in preference to the simple noncontingent contract, only when they cannot specify an optimal renegotiation parameter and verification cost is relatively low.

Option contracts. These contracts also are costly to write but sometimes do better than simple noncontingent contracts. To see how, consider a buyer-option contract under which the buyer chooses between outcomes (d^H, p^H , s^H) and (d^0, p^0 , s^0), where p^H and p^0 are set so that the buyer prefers trade of the specialized good at price p^H in state H and renegotiation from the no-trade outcome in state L. If the buyer trades the specialized good in state H, he receives $60 - p^H$; if he seeks the

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[20]Recall that the parties are assumed to have equal bargaining weights. Hence, the seller would make an up front payment of one half the expected surplus to the buyer. Since the seller keeps the entire realized surplus, efficient investment incentives are maintained.

specialized good in state L through renegotiation, he gets $-p^H + (½)s^0(20)$.[21] If the buyer always refuses trade and renegotiates, he receives $-p^0 + (½)s^0(60)$ in state H and $-p^0 + (½)s^0(20)$ in state L.

The buyer thus will behave as prescribed if and only if

$$60 - p^H \geq -p^0 + (½)s^0(60)$$

and

$$-p^0 + (½)s^0(20) \geq -p^H + (½)s^0(20).$$

Simplifying these expressions, we have $60 - 30s^0 \geq p^H - p^0 \geq 0$. The seller's incentive to invest at level h is highest if $60 - 30s^0 = p^H - p^0$; in this case, the seller expects $p^0 + (½)s^0(20)$ if he were to invest at level l and

$$(½)[p^0 + (½)s^0(20)] + (½)p^H - F(h)$$

if he were to invest at level h. The payoff from h can be simplified by substituting for p^H. Comparing the two payoffs, we find that the seller has an incentive to invest h if and only if $F(h) \leq 30 - 20s^0$. This may suggest that renegotiation should be made infinitely costly (the inequality is easiest to satisfy when $s^0 = 0$). Under option contracts, however, parties renegotiate with positive probability, and again they do not want the renegotiation surplus to be exhausted in transaction costs. The optimal s^0 in this example solves

$$s^0 = (30 - F(h))/20,$$

which the parties can select because $\gamma = 0$ is assumed. Thus, this option contract yields a joint value of

$$(½)(60) + (½)(20)[20 - F(h)]/20 - F(h) - \varepsilon_B = 45 - 1.5F(h) - \varepsilon_B.$$

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[21]Note that the parties renegotiate if d^H is prescribed in state L because d^L is the efficient decision in this state.

Parties may use this contract when it generates relatively large gains, or when the cost of creating it is nontrivially lower than the cost of verifying ex post states.

Coordinated message contracts. As is well known, the seller can be motivated to invest h using a coordinated message contract, by specifying that if the buyer's and seller's messages do not agree then the parties must accept the d^0 trade decision, with no renegotiation ($s = 0$). Reporting honestly is an equilibrium when the difference between the contracted prices in states H and L does not exceed 40. Thus, the coordinated message contract yields a joint value of

$$(½)(60) + (½)(20) - F(h) - \varepsilon_B - \varepsilon_S = 40 - F(h) - \varepsilon_B - \varepsilon_S.$$

On the parameters in this example, a coordinated message contract often does worse than the other contract forms, which helps to show why such contracts are infrequently observed.

Summary. This example illustrates that the parties' ability to induce high investment in costly contracting environments is inversely related to the cost of investment and the cost of contracting. More formally, every contract type can induce efficient investment for some parameter values if $\gamma = 0$ and the legal system is fully cooperative. To find the optimal contract in these circumstances, we must compare the joint values that these types achieve. The parameter space divides into five regions:

Region 1: $F(h) \geq 10$. The parties optimally select a simple noncontingent contract, set $s = 1$, and obtain the efficient joint value.

Outside Region 1, we have

Region 2: $20 \geq \min\{F(h) + \varepsilon_D, 5 + 1.5F(h) + \varepsilon_B, F(h) + \varepsilon_B + \varepsilon_S\}$. The parties choose a simple noncontingent contract that induces $x = l$.

Regions 3: $F(h) > 10$ and $.5F(h) + \varepsilon_B \geq 5 + \min\{\varepsilon_D, \varepsilon_B + \varepsilon_S\}$. The parties choose a buyer option contract and specify an intermediate renegotiation cost,

$$s = \frac{[30 - \sigma(h)]}{20}.$$

Regions 4 and 5: $F(h) > 10$ and $.5 + \varepsilon_B \geq 5 + \min\{\varepsilon_D, \varepsilon_B + \varepsilon_S\}$. In region 4, where $\varepsilon_D \neq \varepsilon_B + \varepsilon_S$, the parties select a verified contingency contract. In region 5, where $\varepsilon_D \geq \varepsilon_B + \varepsilon_S$, the parties select a coordinated message contract. In both regions, the parties pick $s = 0$.

Investment cost is exogenous in our model, but the parties and the law can influence the contracting and renegotiation parameters (ε and s). We turn next to consider how our analysis illuminates how parties do and courts should choose these variables.

5 Implications

5.1 Positive Implications

Contracting costs have been relatively neglected as a field of study. As a consequence, no papers we have found directly test the influence of these costs on contract form. Part 5.1 sets out the empirical predictions that the Propositions above support, and some evidence relevant to them. Given how sketchy this evidence is, our predictions should be taken much more as invitations to do research than as confirmation.[22]

1. *Simple noncontingent Contracts*: Contracts are more likely to take the simple noncontingent form when initial contracting costs are high relative to the gains the deal could create. More precisely,

A. Parties are more likely to use simple noncontingent contracts when their relationship is one shot. Regarding evidence, parties under a recent procurement practice write a detailed "master

[22]Predictions are put as declarative sentences. We set out relevant evidence when we have it.

contract" with a substantial number of terms. The buyer is expected to send a series of orders that specify only the items sought and a delivery time: All other aspects of each shipment are governed by the master contract, which is altered only when exogenous circumstances warrant. This practice suggests that complex contracts may become optimal when parties can spread fixed contracting costs over several deals, and is roughly consistent with the common observation that spot contracting is relatively simple.

B. The law encourages simple noncontingent contracting. As indicated in Part 1, Contract and Commercial Law create a one way rachet in favor of renegotiation. Courts discourage or do not enforce party efforts to make renegotiation more costly but permit party efforts to make renegotiation cheap. This discourages use of the sophisticated contract forms that disfavor renegotiation.

(C) The costs of writing state-contingent contracts are increasing in the number of relevant future states. This implies that, in periods of high volatility, parties write relatively simple contracts and rely on renegotiation to achieve good outcomes. There is some evidence relevant to this prediction. First, an index clause indicates that parties are using a verified contingency contract; under these clauses, the transaction price in any period is a function of verifiable aspects of the ex post state. Volatility increased substantially in the petroleum coke industry after 1973. A study of post-1973 contracts[23] reported that the contract mix shifted from a primary reliance on contract index clauses to an even split "between those [contracts] relying on indexing and those relying on renegotiation", but that "indexing ... functioned as part of the renegotiation process. The index was only expected to be in

[23]Goldberg and Erickson (1987).

force for short periods." Second, raw material prices are short-term volatile and commodity contracts seldom condition on future states.

2. Parties should prefer renegotiation to be cheap when it is costly to contract, and conversely. More precisely:

(A) Parties will attempt to reduce renegotiation costs when they use simple, noncontingent contracts or one sided option contracts. Data about renegotiation costs is hard to get, but there is a suggestive example. Fixed price contracts are common in raw materials markets though there is considerable price volatility. Parties thus anticipate frequent requests for "adjustments" – i.e., for renegotiation. The cost of renegotiating simple contracts could be high were the decision maker to treat a willingness to make adjustments under certain market conditions as a willingness to make them under all market conditions. In response to this concern, the trade association rules that regulate disputes in many commodity markets commonly exclude evidence of prior accommodations under the current contract, or of accommodations under earlier contracts.[24] This restriction facilitates renegotiation.

(B) Parties are more likely to use "no oral modification" terms, terms that restrict the authority of line agents to modify a deal, or other terms restricting renegotiation when they use more sophisticated contracts. As shown above, parties ex ante prefer not to renegotiate state-contingent and coordinated message contracts.

(C) Parties have an incentive explicitly to require renegotiation when they use the simpler contract forms and investment is cooperative. To understand this prediction, assume that the seller's

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[24]See Bernstein, 2001, 1999 and 1996.

investment permits the buyer to use the product more efficiently, and that the seller has rivals. Then, when a simple contract specifies no trade in the ex post state that materializes, the buyer can credibly threaten to purchase the product more cheaply from a rival, even though renegotiation with the original seller would yield a positive gain. The buyer's ability to make a credible exit threat may increase its bargaining power in renegotiation to the point where the seller would anticipate receiving too little surplus to invest efficiently (recall here Proposition 2', holding that when investment is purely cooperative, the optimal renegotiation surplus is bounded from below). A possible contractual response to this possibility is to require the buyer to renegotiate in good faith. A good faith renegotiation requirement is difficult to police, and so cannot reduce the buyer's exit threat to zero. On the other hand, the requirement can increase the buyer's exit costs by prohibiting such easily verifiable practices as buying elsewhere immediately after uncertainty is resolved or threatening to make a market contract during a renegotiation. Good faith renegotiation or price reopener terms sometimes are seen in long term contracts.[25] Their existence is consistent with the analysis here.

3. Party efforts to reduce initial contracting costs should be increasing in the complexity of the deals they would like to make. More precisely:

(A) Merger clauses should be more likely in complex deals. A merger clause attempts to restrict an adjudicator's interpretative base to the written words by excluding evidence of what was said and done during prior negotiations. Restricting the interpretive base is cost reducing. If prior negotiation evidence is admissible, parties may be unable to predict just what aspects of the

[25]See Schwartz (1992).

negotiations a court will later find dispositive. The resultant uncertainty is a tax on contracting. Also, verification costs (θ_D above) are reduced when parties need less evidence to verify each contractually relevant fact or obligation. Merger clauses, if enforceable, thus permit parties to reduce uncertainty and verification costs.

(B) There should be a positive correlation between the use of the more complicated state-contingent or coordinated message contracts and the use of arbitrators, for two reasons:

(i) Arbitration proceedings are less costly than judicial proceedings, and specialist arbitrators are better than generalist courts at evaluating ex post states.

(ii) Arbitrators obey the parties' interpretive instructions but courts commonly do not. This paper shows that efficiency is increasing in the ability of parties to affect initial and renegotiation costs. Thus, arbitration becomes attractive to parties for whom it may be particularly important to affect these costs – that is, to parties who want to give interpretive instructions to the adjudicator, such as not to consider certain forms of evidence (i.e., prior negotiations) or to enforce the original contract rather than a renegotiated contract. There is some evidence that parties who use arbitration routinely do give interpretive instructions. See Bernstein (1996, 2001). Further, such instructions seem more important in connection with sophisticated contracts, so the use of arbitration may be increasing in contract complexity.

(C) Parties should restrict the use of custom to determine the meaning of contract terms. Considerable uncertainty exists concerning when courts will find and how they will apply customs when interpreting contracts. See Craswell (2000). As above, parties may respond to this uncertainty by making contracts more explicit or more simple. An alternative response is to preclude resort to custom

in adjudication, and substantial evidence exists that commercial parties sometimes do attempt, in contracts and trade association rules, to restrict an arbitrator's recourse to custom as an interpretive resource.

That so little data exists relating contract costs to contract form implies the need for serious empirical research. Nevertheless, the theory seems plausible and there apparently is little contradictory evidence. This suggests that it is appropriate to consider the normative relevance of positive contracting costs. Part 5.2 next considers briefly how Contract Law should change.

5.2 Normative Implications

(1) *The Parol Evidence Rule:* This rule provides that when parties intend a writing to contain all of their rights and duties, evidence of prior or contemporaneous negotiations is inadmissible to show what the writing does. Two questions arise in litigation under this rule: Supposing that a contract can have several parts, (a) Did parties intend the writing fully to memorialize at least some aspects of what their agreement covered? (b) If so, does the writing contain only some or all of the parties' agreement? A party disadvantaged by a literal interpretation of the words thus has an incentive to introduce evidence that some or all of the writing is incomplete when read in context. Courts encourage this incentive because they permit extensive recourse to prior and contemporaneous negotiations to resolve interpretive disputes.[26] Consequently, the parol evidence rule is less effective in practice than its formal

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[26]The courts' interpretative stance regarding question (a) is summarized in Restatement (Second) of Contracts §209(3), which provides that when "parties reduce an agreement to a writing which in view of its completeness and specificity appears to be a complete agreement, it is taken to be an integrated [that is, complete] agreement *unless it is established by other evidence* that the writing did not constitute a final expression." (Emphasis added) The courts' interpretative stance regarding question (b) is summarized in the Official Comment to §2-209(3) that "a writing cannot of itself prove

statement might suggest.

(2) *The Merger Clause Rule:* There are two response to this concern. One is to add a "merger clause" to the writing that recites, in essence: "This contract contains the entire agreement of the parties". This response may be ineffective. A leading authority claims: "there has been a tendency to deny such [merger] clauses conclusive effect."[27] Parties thus may be caused to write contracts that not only are complete, but that appear complete; and these may be the simpler contracts. We illustrate this incentive by returning to the example in Part 4.

The example showed that if the parties could control the renegotiation parameter and investment cost was low, they would set s = 1 (renegotiation then becomes costless) and use a simple noncontingent contract. The requisite investment cost, $F(h)$, had to be less than 10. Under the parameters in the example, however, high investment was optimal when $F(h) < 20$. We now let $F(h) = 15$ so that the simple contract would induce the seller only to invest x = 1, yielding a product whose value is 20. Given our assumptions that the parties have equal bargaining weights and that low investment is costless, the price and the seller's net gain under this contract both would be 10.

We ask here whether the parties could do better using a verified contingency contract in either of two interpretive regimes. We denote as "textual" an interpretive regime in which courts apply the parol evidence rule to privilege the written text and also enforce merger clauses literally. The current interpretive regime, in which courts generally do neither, is denoted "contextual". Assume now that

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its own completeness, and *wide latitude must be allowed* for inquiry into circumstances bearing on the intention of the parties". (Emphasis added)

[27]Farnsworth (1999) at 436.

parties contemplate using a verified contingency contract. Under this contract, the price is 60 if the high state occurred (the product then is worth 60) and the price is 20 if the low state occurred. This contract yielded a joint gain of 40 - F(h) - "(d), where "(d) was verification cost. We now consider the possibility of strategic behavior: When the ex post state is high, the buyer claims that the state is low in order to pay the low state price.

Verification costs, it is important to see, are lower in the textualist interpretive regime. An aggrieved seller in this regime would prevail legally by successfully comparing the true ex post state to the contract description of that state. This would be a relatively inexpensive litigation that often could be won on summary judgment. However, if the legally permissible evidentiary base is broad, as in the contextualist regime, the buyer would attempt to show that when prior negotiations are considered the parties meant the actual facts to fall under the description of the low state, though a literal reading of the contract's words would suggest otherwise. The opportunity to make such a showing creates a more difficult law suit for the seller to win. In particular, the seller would have to introduce more evidence and contest more evidence to prevail, and her probability of prevailing will fall.

We capture these differences between the two interpretive regimes by assuming that verification cost is 2 in a textualist interpretive regime and the seller prevails with certainty in a law suit; but verification cost is 3 in a contextualist interpretive regime and the seller prevails with probability .9. On these assumptions, in a textualist legal regime the seller always receives the high price when the state is high. The joint gain from the verified contingency contract is 40 - 15 - 2 = 23, which the parties will split. The seller thus would make an up front payment to the buyer of 11.50, and she would expect to earn

$$½(60) + ½(20) - 15 - 2 - 11.50 = 11.50$$

The parties thus will make the verified contingency contract because both do better under it than they would have done under the simple noncontingent contract.

In the contextualist interpretive regime, verification cost is higher and the seller receives the high price when the state is high only with positive probability. To see how this matters, let y be the up front payment the seller makes to the buyer and calculate her expected gain under the verified contingency contract:

$$½[.9(60) + .1(20)] + ½(20) - 15 - 3 - y = 20 - y.$$

Regarding the first term on the left hand side, the state is high one half the time but the buyer claims the state is low; the seller then sues for the high state price; and she prevails 90% of the time. The state is low one half the time and the buyer then voluntarily pays the low state price. As is apparent, the seller does better under the verified contingency contract than under the simple noncontingent contract only if the up front payment $y < 10$. The buyer would reject any payment below 10, however, because he could earn 10 under the simple noncontingent contract. As a result, the parties would choose this inefficient contract and split the 20 gain. And to summarize, the current contextualist interpretive regime has a so far unnoticed cost; the regime can cause parties to use simple but less efficient contract forms.

(3) *Course of Performance, Course of Dealing and Usage of Trade*: The parole evidence rule bars courts from using evidence of prior or contemporaneous negotiations in connection with the current contract, but the rule does not bar the introduction of evidence regarding the parties' practice under other agreements, the parties' behavior under the current contract, or the customary meaning of the contract language. Section 2-208 of the UCC (and the Common Law) clarify the effect of this gap

in the rule by providing that practice under prior contracts or under the current contract, and "usage of trade" [i.e., custom] "shall be relevant to determine the meaning of the [current] agreement." The UCC does say that an "express" term shall control if one exists, but goes on to recite that a "course of performance shall be relevant [in a litigation] to show a waiver or modification of any term inconsistent with such course of performance." As argued above, these rules raise the cost of renegotiation, and thus seem out of place when parties use simple noncontingent contracts or option contracts. At the least, courts should be responsive to party requests to restrict the admissibility of this class of evidence.

(4) *The No Modification Rules*: Parties prefer to restrict renegotiation when they use state-contingent or coordinated message contracts. The Common Law rule provided that *any* contract could be modified by a later contract. This led courts not to enforce clauses banning renegotiation, and also not to enforce clauses that required modifications to be in writing.[28] The UCC, in §2-209, reversed the latter rule for sale of goods contracts, but then erected procedural and substantive barriers to the enforcement of no-oral-modification terms. Regarding procedure, such a term must be separately signed by the party that did not propose it. Regarding substance, "an attempt at modification ... can operate as a waiver." This last version of the UCC rule means in practice that if a party takes a costly action after an oral modification is attempted, the no-oral-modification term becomes unenforceable. The analysis here would reject the no modification rules in favor of a rule that permitted parties to choose the renegotiation parameter.[29]

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[28]See Blum (2001)

[29]Jolls (1997) makes a similar recommendation but she argues, consistent with the prior literature, that parties would prefer to set $s = 0$ (that is, ban renegotiation altogether).

Relevant here, there is a folk theorem genre of result in the contract theory literature that the parties can restrict renegotiation by involving a third entity. Thus, A and B can contract with each other and with C that if A and B later renegotiate they must pay $x >> 0 to C. The required payment will deter renegotiation. A and B, however, have an incentive to renege on this agreement in order to capture the renegotiation surplus. Thus, C may have to sue for x. This suit would be unsuccessful under current law. The legal principle that leads courts to refuse enforcement to a no renegotiation term in a two party contract would also lead courts to refuse enforcement to third party schemes whose objective is to replicate the no renegotiation term.[30] Our analysis implies that these schemes should be enforceable.[31]

(5) *Agreements to Agree:* Simple noncontingent contracts and one sided option contracts may achieve efficiency by specifying performance in some ex post states but no trade in others. Gains from trade were assumed always to exist in the model, however, so parties were expected to renegotiate in the no trade states. Renegotiation ensured the seller enough surplus to motivate her choice of the efficient investment level. As indicated above, this happy outcome may not occur when a buyer can use the threat to purchase from the seller's rival to capture most of the ex post surplus for

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[30]Current law thus may explain why third party schemes are not litigated and seem not to be observed.

[31]It is sometimes said that third party schemes are not collusion proof because A and B, in the example here, could induce C not to enforce their scheme by paying C a portion of the renegotiation surplus. This claim is unpersuasive for two reasons. First, if the third party scheme were legally enforceable, then C would do better suing for the entire fine than settling for a part of it in a voluntary transaction. Second, the contract parties may be able to choose a third party who cannot accept money. For example, if the parties directed that x be paid to the state as a fine and designated a local prosecutor or attorney general to play the role of C, then for A and B to offer C a share of the renegotiation surplus in return for nonenforcement would be an illegal bribe.

himself. Parties sometimes respond to the buyer's incentive to behave strategically with terms requiring the parties to renegotiate in good faith in specified circumstances. American courts are split on the enforceability of these "agreements to agree." Some courts think it is too difficult to give content to the obligation (what is "good faith"?), and so do not enforce the clauses; while other courts think they can effectively police the bargaining process and so do enforce. The analysis here suggests that the latter practice is best: Efficiency would be increased if courts attempted always to enforce renegotiation-in-good- faith terms in the contexts modeled here.

The Contract Law rules questioned in Part 5.2 seem attractive when the parties are individual persons. In these cases, perhaps the best normative justification for using the state's power to coerce performance is that the recalcitrant party actually consented to the deal. An effective judicial search for true consent requires consideration of *all* relevant evidence, while many of the reforms proposed here would permit parties substantially to restrict a court's interpretive base. The rhetoric of courts and many scholars regarding interpretation commonly does presuppose a picture of natural persons attempting to contract. The model here, in contrast, applies to two firms with linear utility functions who are attempting to maximize the size of the pie in conditions of asymmetric information and uncertainty, and who are repeat market players. When this is the real picture, efficiency is an attractive normative goal, and it implies the default of tying courts more tightly to the written word.

6. Conclusion

This paper embeds positive initial contracting and renegotiation costs in an otherwise standard mechanism design model. The extension yields several interesting implications about party preferences over these costs and over the relation between them. Thus, parties generally prefer low initial

contracting costs because this maximizes party freedom to choose the contractual form that is optimal in their circumstances. When parties choose forms that themselves ensure efficient investment and trade (such as a complete mechanism), they strongly prefer that these contracts not be renegotiated. Initial contracting costs can be high in relation to contractual gains, however, and then parties choose more simple contractual forms that require renegotiation to ensure efficient investment and trade. Our conclusions regarding contracting costs imply the existence of contracting practices that actually are seen, such as the explicit contractual requirement that parties renegotiate in good faith, and party efforts to facilitate renegotiation when they use simple noncontingent contracts.

Contract Law encourages courts to search thoroughly for the parties' actual intentions in creating the contract and in renegotiating it. We show that this search has yielded legal rules that make it extremely difficult for parties to restrict renegotiation, and that can increase greatly the cost of creating sophisticated contracts. As a consequence, parties now have legal incentives to use the more simple contract forms, though these may be the least efficient in a world of more cooperative courts. The search for actual intent rather than the intent that is most consistent with the parties' writing, we argue, is largely misplaced when parties are firms. Thus, Contract Law should change materially (in ways detailed above) to reflect the fact that efficiency is the appropriate normative objective for business contracts, and that efficiency is best served by rules that minimize initial contracting costs and, more broadly, that permit parties to choose the interpretative rules that govern their relationship.

Contracting costs have received little attention in the theoretical and empirical literature on contracting. This paper appears to be the first formal cut at a difficult subject. That we are able to generate a fairly large set of positive and normative implications with a relatively simple model suggests

that these costs should receive more attention than they now do.

Appendix: Generalization and Proofs.

This appendix analyzes contracting environments for a weaker version of Assumption C; and it also provides proofs of the Propositions in the text. We start with technical definitions. Let $M \equiv 1^3$ denote the message space. Given a contract f, we call a subset $K \subseteq M$ a *contract event* if K represents exactly the set of message profiles that the mechanism maps to a single outcome — that is, for some $m \in M$, we have

$$(d^f(m), p^f(m), s^f(m)) = (d^f(m'), p^f(m'), s^f(m'))$$

if and only if $m' \in M$.

Any contract can be written as a list of events and their associated outcomes. More precisely, a contract defines a partition of the message space and it specifies an outcome for each element of the partition. Because we assume that it is costless for parties to specify an outcome (Assumption B), contracting cost is treated here as a function of the partition of the message space. This cost is composed of γ_B, γ_S, γ_D, and κ and complexity costs relating to the fineness or coarseness of the partition. In place of Assumption C, we make the following weaker

Assumption C': Contracting costs are weakly increasing in the size of the implied partition of the message space. That is, if contract f implies a partition that is a refinement of the partition implied by contract f', then $\gamma(f) \geq \gamma(f')$.

We call a contract event K a *null event* if

$$K \cap \{(2, 2, 2) \mid 2 \in 1\}.$$

Finally, we call K a *state* θ *event* if $(\theta, \theta, \theta) \in K$ and either

$$K \cap \{(\theta, \theta, \theta') \mid \theta' \in \Theta\}$$

or

$$K = \{(\theta', \theta'', \theta) \mid \theta', \theta'' \in \Theta\}.$$

If K is a null event, then it is a set of message profiles that would not occur in equilibrium. If K is a state θ event, then K is either a set of message profiles where the buyer and the seller both report θ, or it is the set of message profiles where θ is directly verified.

Proposition 4. There is an optimal contract f^* with the following properties. Given f^*, every null event and every state θ event for which f^* specifies $s \ldots \underline{s}$ turns out to have $s = 0$. Further, if f^* admits a state θ event, then $d^{f^*}(\theta, \theta, \theta) = d^*(\theta)$.

In less formal language, the first conclusion of Proposition 4 is that, for all null and state events of f^*, whenever f^* prescribes a different renegotiation parameter than the default $\underline{s}$, the contract bars renegotiation. The second conclusion is that the contract prescribes the ex post optimal trading decision for all state events.

Proof of Proposition 4: Suppose f is an optimal contract. Represent f as a partition P of M and a list of outcomes, one for each element of the partition. Let *contract* f^* specify the same partition P. For each element K of partition P, we define the outcome specified by f^* in the following way.

1. If K is a null event and if f specifies $s \ldots \underline{s}$ for this event, then let f^* prescribe the same outcome as specified by f except with $s = 0$.

2. If K is a state θ event and if f specifies $s \ldots \underline{s}$ for this event, then let f^* prescribe decision $d^*(\theta)$ and renegotiation parameter $s = 0$ for this event; the price p is set so that the seller obtains the same payoff under f^* as she does under f, for K.

3. If K is a state 2 event and if f specifies $s = \underline{s}$ for this event, then let f^* prescribe decision $d^*(2)$ and renegotiation parameter $s = \underline{s}$ for this event; the price p is set so that the seller obtains the same payoff under f^* as he does under f, for K.

4. Otherwise, have f^* prescribe the same outcome as does f for event K.

Finally, suppose f^* prescribes the same (truthful) behavior at time 4 as f prescribes.

Contract f^* has the same cost as does contract f. It also has all of the properties described in Proposition 4. Furthermore, the parties have the same incentives at time 4 — to report truthfully — with contract f^* as they do with contract f. Finally, by the construction of f^* (in particular, the way the prices are set), we have $u_S(x \mid f^*) = u_S(x \mid f)$ for every investment level x; hence, the seller has the same investment incentive. We also have $u_B(x \mid f^*) \$ u_B(x \mid f)$. Thus, f^* and f have the same cost, f^* and f induce the same investment, and f^* has state-contingent payoffs that are at least as large as the ones under f. This proves that f^* is optimal. *Q.E.D.*

Proof of Proposition 1: We use Proposition 4 to prove Proposition 1. Suppose that, under Assumption C, it is optimal for the parties to use a coordinated message contract f' that specifies $s \ldots \underline{s}$ in some contingency. Since complexity costs are assumed to be zero, this contract will cost $"_S + "_B + (.$ Note that, at the same cost, the parties could write a coordinated message contract f that has the finest possible partition of the message space and specifies the same outcome for each message profile as does contract f'. Contract f thus partitions the message space into separate contract events for each of the messages sent by the parties — where every set

$$\{(2', 2'', 2) \mid 2\,0\,1\}$$

is a separate event, for each $2'$ and $2''$. Contract f is obviously optimal. Note, further, that every event in the partition implied by f is either a null event or a state event. Proposition 4 then implies the

existence of an optimal contract f^* that specifies $d^{f^*}(\theta, \theta, \theta) = d^*(\theta)$ for each state and $s = 0$ whenever f' sets $s \ldots \underline{s}$. In fact, we can assume that f^* specifies $s(m) = 0$ for every message profile m. The same method can be used for the case in which f' is a verified contingency contract. *Q.E.D.*

Proof of Proposition 2: Suppose f' is an optimal simple noncontingent contract specifying $s^{f'} \ldots \underline{s}$. Let the seller choose investment level x' under contract f'. Because x' solves the seller's optimization problem at time 2, it is the case that

$$u_S(x' \mid f') - \Phi(x') \geq u_S(x \mid f') - \Phi(x)$$

for every $x \in X$. From Assumption A, it must be that $d^{f'}$ (the decision prescribed by f') is not ex post optimal in some state θ' that occurs with positive probability following investment x'. In state θ', the parties' strictly prefer to renegotiate ex post. If the parties' contract bars renegotiation, however, ($s^{f'} = 0$), then allowing the parties to share in the renegotiation surplus would disrupt the seller's incentive to select x'. In other words, the seller's incentive constraint is binding:

$$u_S(x' \mid f') - \Phi(x') = u_S(x \mid f') - \Phi(x)$$

for some $x \neq x'$. However, this equality occurs only in knife-edge cases. To see this, observe that if, holding all other aspects of the technology fixed, $\Phi(x')$ were lowered, then the seller's incentive constraint would hold with slack when $s = 0$. The optimal contract would then specify a higher value of s (so the parties could realize some renegotiation surplus). Further, fixing the other aspects of the contracting environment, parties generally will not prefer the default parameter $\underline{s}$ for any investment level x become only a finite number of values of $\underline{s}$ would be optimal. This implies that if ε is low enough, parties will set $s \ldots \underline{s}$. *Q.E.D.*

Note that Proposition 2 does not require Assumption C.

Proof of Proposition 2': Because $d(d,2)$ is constant in 2, the seller has an incentive to choose investment level x' only if

$$\sum q(2, x')s'B_s\, r(d, 2) - F(x') \geq \sum q(2, x)\, s'B_s\, r(d, 2) - F(x)$$

for all x, where the summation is taken over 1. Rearranging this expression yields

$$s'B_s \sum r(d, 2)\,[q(2, x') - q(2, x)] \geq F(x') - F(x)$$

The bound $B(x', d)$ can be defined as the maximum of

$$[F(x') - F(x)] / B_s \sum r(d, 2)\,[q(2, x') - q(2, x)],$$

over all x for which $F(x') > F(x)$. The conclusion about $s' = 1$ obviously holds when $F(x') \geq F(x)$ for all x.

Proof of Proposition 3: Obvious.

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[Incomplete — citations to be added]

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