Describability and Contract Interpretation

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Abstract

A problem in economic contract theory is to know when the inability of parties to describe what the parties want to trade prevents creating efficient investment incentives. A problem in legal contract theory is to develop optimal rules to guide courts in interpreting contracts. These problems are related because actual parties attempt to describe what they want to trade in their contracts, and offer evidence at trial of their ex ante intentions. Hence, the extent to which parties can solve the describability problem is partly a function of how well the legal interpretive rules work. This paper attempts to derive optimal interpretive rules. We show, among other things, that (a) an optimal interpretive rule trades off accuracy in recovering the parties’ intentions against the costs of contract writing and evidence production; (b) an optimal rule sometimes prevents parties from introducing relevant evidence and deters some parties from writing contracts (in these cases, the describability problem is unsolvable); (c) different enforcement institutions – courts and arbitrators – exist in equilibrium; (d) contract writing and evidence production are substitutes while enforcer expertise (appropriately defined) and contract writing are complements; (e) parties need not give interpretive instructions to enforcers because the enforcers and the parties share the same goal: to create efficient incentives to invest; and (f) parties want to instruct courts because courts do not necessarily share the parties’ goals and may not be well informed about the relevant costs and benefits.

1. Introduction

We begin with a description from a case:

Plaintiff Lewis has been doing business as a sawmill operator .... In order to meet competition, Lewis decided to convert his power equipment to hydraulic equipment. He purchased a used system .... Following the installation [of the system], Lewis requested from Frank Rowe, a local Mobile oil dealer, the proper hydraulic fluid to operate his machinery. .... The only information given to Rowe by Lewis was that the machinery was operated by a gear type pump. ... Rowe ... sold plaintiff a product

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known as Ambrex 810. This is a straight mineral oil with no chemical additives.

Within a few days after operation of the new equipment commenced, plaintiff began experiencing difficulty with its operation. The oil changed color, foamed over, and got hot...approximately six months after operations with the equipment had begun, the system broke down.... [Ultimately] on the pump manufacturer’s and Mobile’s representative’s recommendation, a new oil was used which contained chemical additives, principally a “defoament”. Following these changes, plaintiff’s system worked satisfactorily ....

1.1 The describability concern

Consider the classic hold up problem. Parties agree to trade a widget at price P; the widget’s value is an increasing function of the seller’s effort. After the seller invests, the buyer rejects the contract to offer a lower price. The seller’s cost is sunk so trade occurs at $p < P$. Sophisticated sellers anticipate this result and under-invest.

Parties could create efficient investment incentives with “specific performance contracts” that specify price and quality. In conventional wisdom, these contracts are difficult to create and to enforce. A lack of verifiability can preclude enforcement. Bolton and Dewatripont (2005 at 569) explain:

Think, for example, that were the seller to deliver the good, the buyer could always claim it is not of “appropriate quality”. If quality is unverifiable, the court can only observe whether trade took place ... but cannot distinguish who is responsible for the lack of trade.”

When the court cannot tell whether the seller complied with the contract or not, the buyer again can renegotiate to trade at the low price $p$. 

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2 Lewis v. Mobile Oil Company, 438 F2d 500 (8th Cir. 1971). The Ambrex 810 oil was well made, but unsuitable for plaintiff’s equipment. The court held that Mobile breached the contract because it supplied the wrong oil.
The verifiability concern, it seems, should seldom be serious. Let the court observe the seller’s physical performance (for example, the hydraulic oil that Mobile delivered in the Lewis case). Assume also that the court can recover the parties’ purpose for contracting (to trade oil that would lubricate the buyer’s particular pump). Then the buyer could claim that the product “is not of ‘appropriate quality’” only if the product failed to work (the oil caused “foaming”). To generalize, courts usually can observe both whether parties traded or not and what the seller offered to trade. Hence, the verifiability problem disappears if the court also can recover the parties’ contracting intentions.

This reasoning suggests that “describability” may be the more important concern. Consider Hart and Moore’s statement of the problem (1999 at 125), with “oil” substituted for “widget”:

Even though the buyer and seller know at state 1 which oil is the special oil [they want to trade], they have no words to describe it, other than the N [large number of] names, any one of which may turn out to be appropriate at stage 3.

The buyer at stage 3 thus could trigger a renegotiation by claiming that the product the seller delivered did not match the contract description.

Actual parties cope with the describability problem in three ways. (i) contracts often contain extensive descriptions of the subject of sale together with “whereas” clauses describing the parties’ contracting goals; (ii) parties offer description and purpose evidence at trial; (iii) parties choose among adjudicators — we call them “external enforcers” — partly on the basis of an enforcer’s competence in recovering their purposes. How well these efforts solve the describability problem raises a subject that has been lightly treated by economists but is of major concern to lawyers: contract interpretation. The law contains “interpretive rules” that govern a
court’s search for the parties’ purposes, particularly the evidence that a court may consider when making that search. A large fraction of contract cases that reach the appellate courts ask whether these interpretive rules were correctly applied.

This paper attempts to make progress on two fronts. We ask how an optimal interpretive process would work and, relatedly, we ask when describability is a serious problem. To introduce our analysis, let a particular contractual relationship be a “type”. Mobile Oil and Mr. Lewis, in his role as sawmill operator, constitute a type. Their type was formed to trade a particular oil. The major task of the external enforcer — a court, an arbitrator — is to uncover a relationship’s type. This is because the seller complies with the contract when her physical performance and the parties’ type match (the seller delivers lubricating oil with a “defoament” additive). In this event, the enforcer should order the buyer to make the contractually specified transfer, but otherwise not. When parties expect enforcers to be accurate, contracts can create efficient investment incentives.

Contract interpretation is a nontrivial exercise because it can be difficult for an enforcer to recover a relationship’s type. The enforcer decides on basis of the contract, the seller’s performance, commonly known facts (hydraulic oil is used for machines, not heating homes), the enforcer’s special knowledge (he may be an arbitrator who knows the lumber industry), and the evidence parties introduce. These bits of information shrink the possible “type space,” though not necessarily to a singleton. As a consequence, the categories “verifiable” or not and “describable” or not are too restrictive. Rather, identification of a relationships’ type depends on the mixture of verifiable items, describability, and the ways in which contracts are interpreted. In particular, the external enforcer’s expertise and the interpretive rules that he applies will partly
determine whether a particular relationship’s type can be distinguished from other types.

1.2 Model and results

We use this view of the interpretive process to address the following questions: (a) What interpretive rules are optimal (i.e., best solve the describability problem)? (b) In precisely what does enforcement expertise consist? (c) Why do multiple systems of external enforcement, such as courts and arbitration panels, coexist? (d) Should an external enforcer hear all the evidence that parties want to admit? (e) Do contracting parties have preferences over external enforcers and their rules? (f) Should the enforcer obey any interpretive instructions that follow from these preferences?

That asymmetric information is at the core of contractual problems is well known. Of particular importance are information asymmetries between the contracting parties (jointly) and the external enforcer. In this respect, our model emphasizes the distinction between *outcome asymmetry* and *contextual asymmetry*. Outcome asymmetry exists when the enforcer cannot observe an action that an agent took under a contract. Contextual asymmetry exists when the enforcer cannot recover sufficient details about the parties’ circumstances (at the time they contracted) to identify their type, i.e., what they intended to trade.\(^3\) For example, the enforcer may be insufficiently informed about the properties of hydraulic oils, sawmill machines or the lumber business to know whether Ambrex 810 complied with the contract (if so, the problem was the buyer’s poor maintenance of his pump), or whether Ambrex 810 was unsuited for the pump the buyer owned. Put more generally, describability is a problem when parties cannot

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\(^3\)The distinction between outcome asymmetry and contextual asymmetry is related to the distinction between hidden action and hidden information, where outcome asymmetry refers to productive actions that occur after contracting and are not observed by the enforcer, and contextual asymmetry refers to information that the parties have when they contract but which the enforcer may not directly observe later.
sufficiently reduce contextual asymmetry.

Much of the contract-theory literature focuses on outcome asymmetries. The literature on renegotiation and hold-up concerns actions that occur after the contract is made. The central issues in that literature concern when and how outcome asymmetry precludes efficient outcomes.

Contextual asymmetry is particularly important when the contracting environment is more complex than the language in which the contract can be written. If the “context space” (the various types of contractual relationships) and the “outcome space” (the various things that can occur in a relationship) are both complex, then a simple language is insufficient for all contractual relationships to describe their preferred outcomes precisely. A contract then functions as a signal parties send to the external enforcer of their type. The signal’s quality depends on the limits of the available language read in connection with other data that the enforcer can access.

We model relationships (a buyer and a seller) that contract to perform a productive action such as providing a service or producing a product. The seller chooses an effort level, which the enforcer cannot observe. As in the example above, the enforcer’s role is to recover the relationship’s type, which identifies the intended performance (i.e., the required product) and the optimal effort level for this particular relationship. The enforcer observes the contract, evidence that he permits parties to introduce in the enforcement phase, and the performance the seller tenders (i.e., the product but not the effort that generated the product). The enforcer compels

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4 Following Shavell, we note that the existence of contextual asymmetry is a necessary condition to the presence of contracts. Suppose that the external enforcer could costlessly recover the full context that existed for the parties when they came together. Then he could ex post (at the time of enforcement) calculate the optimal contract that this type of contractual relationship would ex ante want. The enforcer then could then match this reconstructed contract to the seller’s performance, thereby saving the parties the cost of writing the contract themselves.
transfers on the basis of his information, which includes his updated belief about the parties’
type.

The more accurate the enforcer is — the more likely he is to order a transfer when the
seller actually complied with the contract — the better are the parties’ ex ante incentives. The
parties thus prefer accurate enforcers. Accuracy can be increased through more detailed
contracts and the provision of context evidence, but contracts are costly to write and evidence is
costly to produce.\(^5\) Much of our modeling effort is geared toward deriving optimal interpretive
rules: the interpretive “styles” that best trade off the virtues of accuracy against the costs of
contract writing and evidence production.

The model’s main endogenous elements are the contractual specifications of the various
relationships in the population and the external enforcer’s interpretive rule, which maps
contracts, performance outcomes, and evidence into transfers. The optimal interpretive rule
solves the design problem of maximizing social welfare (aggregate welfare across the population
of contractual relationships).

The main exogenous objects of analysis are (i) the size and costs of the available
contractual language, (ii) the cost of providing context evidence (about the type), and (iii) the
external enforcer’s level of technical sophistication. Item i measures the number of different
contracts that can be formed and their cost. Item ii measures both the costs of producing
evidence and the amount of evidence needed to inform the external enforcer of the parties’ type.
Item iii denotes the external enforcer's ability to distinguish among different relationship types
on the basis of the signals he observes. The quantum of necessary evidence varies inversely with

\(^5\) Accuracy can also be increased by raising the external enforcer’s expertise, but this also involves costs and
institutional constraints.
the enforcer’s expertise. Similarly, an expert enforcer can make accurate type inferences from relatively coarse contract descriptions.

Regarding results, we show that it is sometimes optimal for the enforcer to disallow contextual evidence. The external enforcer optimally shuts down the evidence channel (that is, prevents the parties from introducing context evidence) when evidence production is sufficiently costly. We also explore how expertise and language are related, either as substitutes or as complements. Raising the external enforcer’s technical sophistication — his ability to evaluate evidence — reduces the parties’ need to signal their type through the contract; then the parties will optimally use a coarser contractual language. A parameter shift that lowers the cost of evidence production has the same effect. On the other hand, the better able the enforcer is to observe the performance outcome, the more productive are contract descriptions and evidence production. Further, multiple enforcers exist in equilibrium because the choice of enforcer is a signal of type. The phrase “we will use arbitration” thus can substitute for contractual whereas clauses. The existence of multiple enforcers with different interpretive styles therefore effectively expands the language in which contracts can be written.

Finally, parties in our model have no need to send interpretive instructions to enforcers because parties and enforcers share the same goal: to maximize welfare. An enforcer pursuing this goal will choose interpretive rules that create efficient investment incentives. Hence, an enforcer admits context evidence when parties would want it admitted, and not otherwise. In contrast, parties may need to give interpretive instructions to courts because Contract Law’s interpretive rules do not attempt to implement welfare maximization, nor are courts as expert as our enforcers at making cost/benefit tradeoffs.
Our modeling exercise takes as an input the literature on costly contracting and limits on describability (Dye 1985, Anderlini and Felli 1999, Battigalli and Maggi 2002, Schwartz and Watson 2004). Our work is closely related to that of Shavell (2006). Certain core elements of our model are in his (both having contextual asymmetry and a limited language). There are significant differences in our studies, however. Our model includes evidence production and expertise, and we focus on the trade offs between language, evidence, and expertise; on the comparison and interaction of multiple enforcers; and on the various elements of language costs and welfare consequences. Shavell (2006) does not analyze these issues. We also differ regarding the nature of meaning in contract. Shavell assumes that words have exogenously defined “literal meanings” and some of his results follow from this premise. In our model, the meaning of a contract is inferred from its contractual setting: that is, from its interpretation by an external enforcer.6

2. The Model with a Single External Enforcer

There is a population of contractual relationships consisting of buyers and sellers. Each relationship is distinguished by its type \( t \in [0, 1] \), where the interval \([0, 1]\) is the space of types and the type distribution is uniform. The type variable represents characteristics of an individual relationship (the seller is an oil company; the buyer needs a particular kind of lubricating oil for his pump). The seller agrees to perform a service for the buyer. She chooses an action \( q \in [0, 1] \) where \( q \) is the seller’s effort level or investment, which we refer to as effort. Performing at level

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6Shavell’s premise leads him to conclusions such as that “opt-out” clauses (that would prohibit the external enforcer from using certain evidence) should be enforced verbatim. We conclude instead that whether interpretive instructions should be obeyed — indeed, whether they will be given — is a function of what the enforcer is maximizing and how he behaves.
\(q\) costs \(c(q)\). The seller’s service yields output for the buyer, which is high with probability \(q\) and low with probability \(1 - q\). High output gives the buyer a benefit of 1; low output yields zero. The seller privately knows \(q\) (the buyer does not observe it) and the buyer privately observes the benefit.

With transferrable utility, a relationship’s welfare is maximized when the seller selects \(q\) to solve:

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\max_q q - c(q).
\]

The cost function \(c\) is twice continuously differentiable, with the standard properties \(c' > 0\), \(c'' > 0\), \(c''' > 0\), and \(\lim_{q \to 1} c(q) = \infty\). Let \(q^*\) denote the solution to the maximization problem. That is, \(c'(q^*) = 1\).

After output is realized, a related public signal \(x\) is drawn and observed by the external enforcer. We call \(x\) the productive outcome of the relationship. It also is convenient to think of \(x\) as the seller’s physical performance. The signal \(x\) provides information about output quality, but knowledge of \(t\) is required to extract the information. As in the example above, a court can know that the seller delivered well made Ambrex 810 oil, which tells the court that the parties were unlikely to be trading computers. On the other hand, the court does not know whether Ambrex 810 delivered high or low output unless the court also knows \(t\) (the seller’s product line, the buyer’s machinery, and so on).  

The interpretive problem illustrated here is common in Sales Law. Section 2-314 of the Uniform Commercial Code provides that a seller’s performance is compliant if it “passes without objection in the trade” or is “fit for the ordinary purposes for which is used”. The former criterion requires the court to find what goods trade types commonly buy, and whether the parties before it likely comprise one of those types. For example, a certain type of grain would be acceptable to a maker of animal feed but not to a maker of bread. A seller who delivers that grain is in compliance if the court believes that the parties are a “feed type”. The latter criterion requires the court to find what trade types require of the goods they buy. For example, grain intended for baking must rise to a certain level when mixed with yeast. The grain the seller delivered has certain rising properties. If the court believes that the parties at bar are a “baking type”, the court can match the grain’s properties to baking type requirements.
To represent the relationship between $x$ and $t$ in a simple way, we let the space of productive outcomes be coextensive with the space of types, so $x \in [0, 1]$. When output is high, $x = t$ with probability $s \in [0, 1]$; with complementary probability $1 - s$, $x$ is drawn from a uniform distribution over $[0, 1]$ (i.e., $x$ is unilluminating). When output is low, $x$ also is drawn from a uniform distribution over $[0, 1]$.

On this view, $x$ – what the seller delivers – is uninformative about the quality of output without some knowledge of $t$. On the other hand, $x$ perfectly reveals output quality when the relationship’s type is known.

Parties interact with the enforcer after the seller performs. The enforcer can compel a monetary transfer between them as a function of the information that he has about their relationship. This information consists of (i) the contract, (ii) a signal of the parties’ type that represents what the enforcer can readily observe about context, (iii) evidence about type that the parties submit, and (iv) the productive outcome $x$. The first three items refer to contextual information (the relationship’s type); the productive outcome relates to both type and output.

The contract is written in a language that may be limited relative to the space of types and outcomes, $[0, 1]$. The space of feasible contracts is the set of positive integers, $P = 1, 2, 3, ...$. Selecting a contract is costly. For each $k \in P$, contract $k$ costs the parties $y_k$ to form. Contracts

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Returning to the first criterion, if the product in question would be acceptable to trade types but the buyer rejects it, the particular parties’ type may be special. In this case, the seller is not in breach unless she should have recognized the relationship type she was forming. See UCC §2-315.

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8 The distribution of $x$ treats pairs of types symmetrically; that is, if type $t$ gets an outcome $x \neq t$ then the type is equally likely to be any other type. In other words, each type is equally close to every other type in the distribution of $x$. Although this extreme form of symmetry is not particularly realistic, it is helps to keep the model tractable.

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9 This signal includes the pleadings in a law suit, and knowledge the enforcer may have acquired about deals in general or the parties’ industry in particular.
are ordered so that \( y_k \) is increasing in \( k \), and we let \( y = (y_1, y_2, \ldots) \). Also, let \( k = 0 \) represent “no contract,” which means that the buyer and seller decide not to have a relationship. For simplicity, we sometimes use the word “language” to refer to contracting costs, where “greater language” means lowering some components of \( y \). If the contracting cost eventually becomes large in \( k \), which mean that for every \( \kappa \) there is a \( k \) such that \( y_k > \kappa \), then some contractual relationships optimally, and in equilibrium, will not differentiate themselves by their contract choice. Different types choose contracts that are sufficiently similar so that the enforcer, without more information, cannot distinguish one type from another. Hence, different contracts — different \( k \)’s — are contracts that the enforcer can reasonably distinguish among.\(^{10}\)

The external enforcer’s direct signal of a relationship’s type — information category (iii) above — is modeled as a partition \( \Lambda \) of the type space \([0, 1]\). For each type \( t \), rather than observing \( t \) itself, the enforcer observes only a particular subset \( \Lambda(t) \subset [0, 1] \) that contains \( t \). Because \( \Lambda \) is a partition, we have that \( t' \in \Lambda(t) \) implies that \( \Lambda(t') = \Lambda(t) \). For example, if the partition is given by \( \Lambda = \{[0, 1/2], [1/2, 1]\} \) then, for any relationship type \( t \), the enforcer could observe whether or not \( t < 1/2 \). Thus \( \Lambda(t) = [0, 1/2) \) for every \( t < 1/2 \); and \( \Lambda(t) = [1/2, 1] \) for every \( t \geq 1/2 \).

More concretely, contractual phrases that cause interpretive concern do not have a “plain” meaning in our model. Rather, the external enforcer finds meaning by using context information. As an example, a seller takes ten days to deliver a piece of medical equipment under a contract that specifies “prompt delivery”. A ten day delivery probably would be a

\(^{10}\) a special case, there is a set \( 1, 2, \ldots, K \) of “common” contracts that the external enforcer is familiar with and that are relatively easy to specify. We might then assume that \( y_k = 0 \) for \( k \leq K \). The question would then be whether a contractual relationship would have the incentive to expand the set of contracts in use by selecting contract \( K + 1 \) at some positive cost.
breach if the equipment were needed for urgent care but may be compliance if the equipment was to be stocked for future use. An enforcer with knowledge of the health care industry would believe that the parties type is such that they contracted for overnight delivery if the equipment commonly is purchased only as needed. Using the model’s notation, \( \Lambda(t) \) would take up a small fraction of the type space (i.e., the type at issue is drawn from the small set of types who trade that piece of medical equipment under the understanding that fast delivery is expected). For a less expert enforcer, \( \Lambda(t) \) takes up more of the possible type space so he needs more evidence to locate the parties’ type.

We model evidence by assuming that, at cost \( \gamma \in [0, 1] \), the buyer can submit evidence that reveals his relationship type \( t \).\(^{11} \) This is a coarse account of evidence production, but it is sufficient to yield the trade-offs we are interested in analyzing. The key feature is that the incentive to provide evidence will depend on the realized outcome \( x \) as well as on the other information available to the enforcer.

Three elements of the model represent the external enforcer’s expertise. As just suggested, the partition \( \Lambda \) represents what the enforcer can readily infer about context. A more refined partition implies greater expertise; that is, if \( \Lambda' \) is a refinement of \( \Lambda \) (mathematically, each element of \( \Lambda' \) can be written as the union of a set of elements in \( \Lambda \)), then \( \Lambda' \) represents a greater level of expertise than does \( \Lambda \). The parameter \( \gamma \) also represents expertise in the sense that less evidence is needed to reveal the type to an expert enforcer. Hence, the lower \( \gamma \) is the greater the enforcer’s expertise is. Finally, \( s \) represents the enforcer’s ability to access the performance

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\(^{11}\)We later show why only buyers submit evidence in the model. Note that context evidence introduced at trial reveals a relationship’s type with certainty. If evidence only revealed type with positive probability, then since evidence is costly an optimal interpretive rule would preclude admission in more cases than the rule we derive below. The model’s qualitative results would not change, however.
outcome accurately when output is high. The greater is \( s \) given a particular \( x \), the more expert the enforcer is. We refer to expertise in reference to \( \Lambda \) and \( \gamma \) with the term *technical sophistication*, and we refer to expertise in reference to \( s \) with the term *probatory depth*.

Here is a summary of the timing:

1. A buyer and seller meet and learn their type \( t \). The parties select a contract \( k \) and jointly pay the cost \( y_k \). They divide the expected surplus by making an up-front transfer.

2. The seller chooses \( q \) and incurs cost \( c(q) \). Her choice of \( q \) is private information.

3. The seller performs so the productive outcome \( x \) is drawn: the buyer obtains 1 if output is high.

4. The buyer decides whether to provide evidence of \( t \) at cost \( \gamma \). Evidence reveals \( t \).

   The seller observes \( x \).

5. The external enforcer observes \( k \), \( \Lambda(t) \), and \( x \). If the buyer produces evidence, the enforcer also observes \( t \). The enforcer compels a monetary transfer \( m \) from the buyer to the seller.

   The buyer thus chooses whether to provide evidence before the seller observes \( x \). The motivation is that the buyer sees the outcome first, and he has to decide whether to expend resources on evidence before the parties are in a position to renegotiate. Thus, it is not possible to remove the inefficiency due to costly evidence production through renegotiation. One could model evidence and renegotiation in a more sophisticated way, but this would not reveal more about the enforcer’s interpretive role.

Regarding it, an *interpretive rule* maps the enforcer’s information \((k, \Lambda(t), x, \text{and})\)
sometimes \( t \) to the enforcer’s selected transfer \( m \). We use two functions, \( f \) and \( g \), to describe the rule. Function \( f \) gives the enforcer’s choice of transfer if evidence reveals \( t \), so \( m = f(x, k, t) \). Function \( g \) gives the enforcer’s choice of transfer if there is no indicative evidence, so \( m = g(x, k, t) \) with the additional assumption that, as a function of \( t \), the function \( g \) is measurable with respect to \( \Lambda \). The measurability requirement for \( g \) represents the enforcer’s limited direct information about the type.

The interpretive rule allows or disallows evidence depending on whether
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f(x, k, t) + \gamma \leq g(x, k, t).
\]

The left-hand side of this inequality is the transfer that an enforcer who knows the relationship’s type compels plus the buyer’s cost of informing the enforcer. The right-hand side is the transfer that an enforcer compels when he does not see context evidence at trial. When the inequality holds, the buyer provides evidence of his relationship’s type and pays the associated cost \( \gamma \), so that he will be compelled to transfer \( f(x, k, t) \) rather than \( g(x, k, t) \).

To keep the model simple, we limit attention to the case in which, in the absence of evidence, the interpretive rule separates the outcome space into two sets, with some arbitrary transfer \( m^0 \) for one set and a transfer of zero for the other set. The enforcer cannot compel the seller to make an arbitrarily large transfer. In the US, courts cannot impose penalties (transfers that exceed the buyer’s expected gain). Also, parties usually face liquidity constraints.

The constraint on transfers sometimes binds because the enforcer cannot perfectly detect when output is high. When there is a great deal of noise (when the enforcer does not know \( t \), and \( s \) is strictly less than 1), the seller will choose the efficient effort level only if the difference between the transfer the buyer must make when the enforcer receives a good signal of output and
The assumption of a bound on transfers is not critical to our modeling exercise or our main points. More general versions of the model without transfer constraints have similar features to the model discussed here but are more complicated to analyze. The enforcer thus could require the buyer to transfer 1 to the seller if he receives a good signal about output, and to require no transfer otherwise.

The enforcer’s interpretive style is said to be contextual if his rule is sensitive to indicative evidence and gives the buyer an incentive to submit it in some contingency (implying that $f$ and $g$ are not identical). For this enforcer, that is, $f$ and/or $g$ are not constant as a function of $t$. The enforcer’s interpretive style is acontextual if $f$ and $g$ are constant in $t$.

In equilibrium, we have that:

(i) each relationship forms the contract that maximizes its value, given the external enforcer’s interpretive rule;

(ii) the seller behaves optimally in choosing $q$ and the buyer behaves optimally in deciding whether to provide contextual evidence; and

(iii) the external enforcer selects an interpretive style to maximize the total value of the population of contractual relationships.

Consider two different accounts of how the external enforcer and the contracting parties interact. In the first account, the external enforcer can commit to an interpretive rule (the

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functions \(f\) and \(g\) before contractual relationships are formed. In the second account, the external enforcer is unable to commit, but rather selects the interpretation “on the fly” — that is, when contracting parties present contracts and request enforcement. The first account is realistic in environments in which enforcement institutions (including interpretive rules) remain fixed for long periods of time. The second account is realistic if institutions can adjust relatively often. The two accounts are related, however, because in the second account contracting parties would, in equilibrium, correctly anticipate the external enforcer’s interpretive rule. In fact, equilibrium behavior in the first setting constitutes an equilibrium in the second setting. Further, equilibrium behavior is characterized by the solution to a simple decision problem that is described at the end of the next section. We ignore distributional concerns (how value is divided between the seller and buyer).

3. Characteristics of the Optimal Interpretative Rule

3.1 The enforcer’s task and the parties’ behavior

The enforcer’s task is give the seller an incentive to exert effort. Effort is private information so the enforcer must order a higher transfer when output is high than when output is low. The enforcer, however, cannot directly observe output: whether the seller actually complied with the contract. Hence, the enforcer must create a margin on the basis of his observation of the productive outcome \(x\) (the seller’s observable performance). The seller thus must be rewarded for values of \(x\) that are associated with high output, and not rewarded otherwise.

To see how the enforcer proceeds, observe first that he must distinguish between types because he cannot infer a compliant performance from \(x\) alone. Also, relationship types cannot
differentiate themselves arbitrarily finely through contract selection because contract costs are increasing in contract informativeness. Hence, the optimal interpretive style is contextual: the enforcer sometimes should consider evidence in addition to the contract and the seller’s performance in order to cabin the type space.

Recall also that the enforcer can distinguish between different elements of the partition \( \Lambda \) on the basis of his own experience and in the light of publically available information that is illuminating regarding context. Parties will not use the contract or supply evidence in order to differentiate themselves across partition elements that the enforcer can create on his own. Hence, we analyze individual elements of the partition \( \Lambda \) independently of the analysis of other elements. For example, if the enforcer can readily determine whether \( t \in [0, 1/2] \) or \( t \in [1/2, 1] \), then a type in \([0, 1/2]\) is concerned only to differentiate itself from other types in this set.

Given separability across elements of \( \Lambda \), we restrict attention to a single element of \( \Lambda \). Denote this element \( T \). Thus, we write \( T = \Lambda(t) \) where \( t \in T \). In the above example, we could have \( T = [0, 1/2] \). Letting \(|.|\) denote cardinality (size), and recalling that \(|[0, 1]| = 1\), we see that \(|T|\) is the fraction of types in this element of the enforcer’s information partition. In the example above, we have \(|[0, 1/2]| = 1/2\).

\( T_k \) denotes the subset of types in \( T \) that select contract \( k \), as pictured below. We calculate, for a fixed \( T, k, \) and \( T_k \), the optimal specification of \( f(\cdot, k, t) \) and \( g(\cdot, k, t) \) over all \( t \in T \). That is, we calculate the optimal interpretive rule restricted to \( T \) and \( k \) under the assumption that \( T_k \) is fixed. Although the enforcer’s interpretive rule influences which relationships actually select contract \( k \), as is explicated below, we show next that the optimal interpretive rule maximizes the
total value of the relationships in $T_k$ holding fixed this set.$^{13}$

Given the limitations we have imposed on the interpretive rule, two logical steps simplify the analysis. Because $T$, $k$, and $T_k$ are assumed fixed for now, we write $g$ as a function of $x$ only. Also, because $f$ is the enforcer’s interpretive rule when he sees evidence, we write $f$ as a function of $x$ and $t$. Let $S$ denote the set of outcomes for which the enforcer compels transfer $m^0$ in the absence of evidence. That is, we have $g(x) = m^0$ for all $x \in S$, and we have $g(x) = 0$ for all $x \not\in S$. We need to determine $m^0$, the set $S$, and the optimal values of $f(x, t)$ for all $x$ and $t$.

First note that, conditional on the type being in set $S$, any productive outcome $x \in S$ is “good news” regarding high output (because high output increases the chance that $x = t$, which is in $S$). Likewise, any $x \not\in S$ is “bad news”. Because outcomes in $S$ lead to the transfer $m^0$ in the absence of evidence, and outcomes outside $S$ lead to zero transfers, sellers in relationships with types in the set $S$ are given some incentive to exert effort; sellers with types outside of $S$ have no such incentive. Since only types in $T_k$ selected contract $k$, the effort incentive is tailored to these types. Thus, we know that $S \subset T_k$. $^{14}$

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$^{13}$ If in equilibrium the enforcer is not maximizing as described, then there is another interpretive rule that improves the total value for types in $T_k$ under the assumption that this is exactly the set of types that select contract $k$. Some types in this set may now prefer to use a different contract and types outside of this set may want to switch to use contract $k$. These adjustments can only further raise aggregate value, however.

$^{14}$ To see more clearly what is claimed, recall the medical equipment example above. The enforcer may believe that parties who wrote the contract at issue commonly require delivery within two days; Let $S$ denote these relationship types. The enforcer then observes that the seller delivered within two days; that is, the productive outcome $x$ falls within the two-day limit. Hence, $x \in S$ and the enforcer will compel a transfer that rewards the seller.
Second, observe that the specification of \( f(x, t) \) affects the incentives only of the seller in the type \( t \) relationship. Thus, we can determine the optimal interpretive rule \( f(x, t) \) by calculating the value of this relationship. Recall that the buyer provides evidence when the outcome is \( x \) and

\[
f(x, t) + \gamma \leq g(x) = m^0
\]

Since \( x = t \) signals high output, the seller’s effort incentive is enhanced by rewarding her in this case. Thus, for the case of \( x = t \), it is best to set \( f(t, t) \) high. Since the buyer will not provide evidence to increase the amount he must pay to the seller, any \( f(t, t) \) above \( m^0 - \gamma \) yields the same result, so we can set \( f(t, t) = m^0 \). The buyer thus provides evidence only when \( x \in S \setminus \{t\} \). In this case, the relationship is not of type \( t \) but the enforcer, without evidence, regards \( x \in S \) as good news and so would require the buyer to make the transfer \( m^0 \). By providing evidence, the buyer can show that \( x \) is actually bad news (because it does not equal \( t \)). The productive outcome, in other words, indicates breach so the buyer should not pay the contract price.

The question then is whether the interpretive rule gives the buyer a sufficient incentive to provide evidence when appropriate. Suppose that \( f(x, t) \) is low enough so that

\[
f(x, t) + \gamma \leq g(x) = m^0.
\]

In this case, the buyer provides evidence when the outcome is \( x \), so it is optimal to set \( f(x, t) = 0 \). That is, the buyer proves at trial that \( x \) incorrectly signals his type — the seller has not performed
— so the buyer should pay nothing. The seller anticipates this result and thus has an added incentive to exert effort. If the inequality $f(x, t) + \gamma \leq m^0$ does not hold, the buyer will not provide evidence so the exact value of $f(x, t)$ does not matter. Therefore, we need to consider two possibilities: either $f(x, t) = m^0$, in which case evidence is not allowed, or $f(x, t) = 0 \leq m^0 - \gamma$, in which case the enforcer will hear evidence.

### 3.2 Determination of when context evidence should be allowed

We derive the conditions under which context evidence should be allowed, beginning by analyzing the case in which evidence is allowed. Suppose that $x \neq t$ and let evidence be admissible. We know that the buyer produces evidence whenever $x \in S \setminus \{t\}$ to avoid having to pay $m^0$. The seller’s expected payoff from choosing $q$ thus is

$$qsm^0 - c(q),$$

The seller receives the transfer $m^0$ when output is high (with probability $q$) and when the outcome correctly matches her relationship’s type (with conditional probability $s$). The seller receives no transfer otherwise because $x$ is not in $S$ or because the buyer provides evidence indicating that $x \neq t$. The seller maximizes her expected payoff by choice of $q$, which yields the first-order condition:

$$sm^0 = c'(q).$$

Let $q^E$ denote the solution. Types in $T_k \setminus S$ get a value of zero under this interpretive rule
(because their sellers have no incentive to exert positive effort). Each relationship whose type is in $S$ gets an expected joint value gross of contracting cost of

$$v^E = q^E - \gamma(1 - sq^E)|S| - c(q^E).$$

The superscript E denotes the case where evidence is admissible. The first term on the right-hand side is the value of the seller’s performance; the second term is the expected cost of evidence production (when it is optimal for the buyer to produce it); and the third term is the seller’s effort cost. Because $q^E$ is less than the efficient effort level, $v^E$ is increasing in $q^E$.

Combining this with $q^E$ increasing in $m^0$, it is optimal to require the highest possible transfer: $m^0 = 1$.

Next consider the case in which the external enforcer does not allow evidence: $f(x, t) = m^0$ for $x \in S \backslash \{t\}$. The seller’s expected payoff from when he chooses $q$ is then

$$qsm^0 + q(1 - s)|S|m^0 + (1 - q)|S|m^0 - c(q).$$

The first term is the seller’s payoff when quality is high and the outcome is $x = t$. The second term describes the case in which output is high but $x \in S \backslash \{t\}$, which occurs with probability $q(1 - s)|S|$. The third term is the seller’s payoff when quality is low and $x \in S \backslash \{t\}$, which occurs probability $(1 - q)|S|$. The seller receives the transfer $m^0$ in all three cases. The first-order condition for the seller’s effort-choice problem is:
\[ s[1 - |S|]m^0 = c'(q). \]

Let \( q^N \) denote the solution. Note that the seller exerts less effort when evidence is excluded because the enforcer is less accurate then. Furthermore, \( q^N \) is decreasing in \( |S| \) because as \( S \) gets larger (and more and more types are lumped together) the strength of the good-news signal diminishes. Also, \( q^N \) converges to \( q^E \) as \( |S| \) goes to zero. As with the case of allowed evidence, types in \( T_k \setminus S \) get a value of zero under this interpretive rule, whereas each relationship whose type is in \( S \) gets an expected joint value of

\[ v^N = q^N - c(q^N). \]

As before, increasing \( m^0 \) has the effect of increasing \( q^N \) and thus improving welfare. So we conclude here as well that it is optimal to set \( m^0 = 1 \).

To summarize, it is optimal to set \( m^0 = 1 \) regardless of whether evidence is allowed. The remaining tasks are to calculate the optimal \( S \) and to determine whether it is best to allow evidence. \( S \) enters the expressions above only through \( |S| \), which means that only the size of this set matters. We can thus write \( v^E \) and \( v^N \) as functions of \( |S| \). We write \( \sigma = |S| \). Recall that \( |S| \) is the size of the subset \( S \) of the type space. For example, \( S = [\frac{1}{2}, 5/8] \) implies that \( |S| = 1/8 \).

The external enforcer optimally allows evidence if \( v^E(\sigma) \geq v^N(\sigma) \). The enforcer’s goal is to maximize the aggregate value of relationships, which is \( \sigma \) times the larger of \( v^E \) and \( v^N \) (because the types in \( T_k \setminus S \) get zero). Thus, for the set of types \( T_k \) that select contract \( k \), welfare under the optimal interpretive rule gross of contracting cost is
It is easy to see that $v^E$ and $v^N$ are continuous. These variables are *decreasing* in $\sigma$ and converge to zero as $\sigma$ approaches 1. Remember that $\sigma$ becomes larger as the set $S$ expands. When $\sigma = 1$, the set $S$ includes every type. Putting this simply, when a partition includes many types, those types are unlikely to be relevantly similar. Hence the enforcer can infer little about type from observing the partition. The analysis implies:

**Lemma 1**: $w$ is continuous, with $w(0) = 0$. There exists a value $\sigma \in (0, 1)$ such that $w$ is strictly increasing for $|T_k| < \sigma$ and constant for $|T_k| > \sigma$.

Regarding the intuition, $w(0) = 0$ because an infinitesimal group of types contributes an infinitesimal amount to aggregate welfare, though their contract is interpreted to favor them perfectly. Welfare increases as more types use a contract because the enforcer can give these types good incentives. This “quantity effect” is nonmonotonic, however, because, when the number of types that use the same contract becomes large, the enforcer becomes inaccurate. Note also that $q^E(0) = q^N(0)$ and so $v^E(0) = v^N(0)$; the latter is the slope of $w$ at $|T_k| = 0$.

### 3.3 Interpretation and describability

This analysis allows us to explore two aspects of the optimal interpretive rule and equilibrium behavior. First, for a given element $T$ of the partition $\Lambda$, suppose the set $T_k$ of types in $T$ that select a specific contract $k$ has a mass of more than $\sigma$; that is, suppose that $|T_k| > \sigma$. Then the external enforcer favors a subset of size $\sigma$ (compelling the transfer 1 if and only $x$ is in
this subset of types). The other types in $T_k$ get zero. If $y_k > 0$ (there is a positive cost of forming contract $k$) then the disfavored types are better off selecting no contract and separating. We thus have:

**Lemma 2:** In equilibrium, $|T_k| \leq \sigma$ for every $T$ and $k > 0$.

The second aspect of the optimal interpretive rule relates to whether the external enforcer allows context evidence. This requires a comparison of $v^E$ and $v^N$ for given $T$ and $k$. In general, there may be values of $\sigma$ for which $v^E(\sigma) > v^N(\sigma)$, so that it is optimal to allow context evidence, as well as values of $\sigma$ for which $v^E(\sigma) < v^N(\sigma)$, so that it is optimal to disallow context evidence. Under some mild additional assumptions, we can be more precise. By calculating first and second derivatives of the value functions with and without evidence, and using the seller’s first-order conditions and the implicit function theorem, we derive the following:

**Lemma 3:** As a function of $\sigma$, $v^E$ is affine and decreasing, and $v^N$ is strictly concave and decreasing. There is a number $\sigma^E \in [0, 1]$ so that $v^E(\sigma) > v^N(\sigma)$ for $\sigma > \sigma^E$ and $v^E(\sigma) < v^N(\sigma)$ for $\sigma < \sigma^E$. A necessary and sufficient condition for $\sigma^E = 0$ is $\gamma(1 - s q^E) c''(q^E) < s (1 - s)$, which holds in particular if $\gamma$ close to 0.

(The proof follows from straightforward calculations of the derivatives of $q^N$, $v^E$, and $v^N$, and use of the implicit function theorem.)

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*15 If $y_k = 0$, the disfavored types are indifferent between selecting contract $k$ and not contracting, in which case we assume that they do not contract.*
Regarding the intuition, evidence is more valuable when \( \sigma \) is large (i.e., a relatively large number of types would be treated the same otherwise). The evidence permits the enforcer to “break down” the type space and order transfers such that sellers expect to be paid when they comply. More obviously, since evidence always is helpful, more should be admitted when evidence production is cheap.

To illustrate the results so far, consider the cost function \( c(q) = q^2/(1-q) \). For this function and a fixed value of \( s \), if \( \gamma \) is small enough, then \( \sigma^E = 0 \) so the external enforcer should always allow context evidence; otherwise \( \sigma^E > 0 \) and the enforcer optimally disallows context evidence if the mass of types using a given contract is small enough. In this latter case, the enforcer can infer type reasonably well without evidence. Here is a graphical depiction of the two cases:

![Graphical depiction](image)

We now can characterize the optimal interpretive rule as the solution to a simple “planner’s problem”. Given the symmetry between types in the model, we need not keep track
of which specific types select the same contract; instead, we can focus on the size of the subset of types that select each contract. For each element $T$ of the enforcer’s information partition $\Lambda$ and for each contract $k$, let $\mu_k \equiv |T_k|$. As developed earlier, the enforcer’s optimal interpretive rule leads to welfare of $w(\mu_k)$, gross of the contracting cost, for the types that select contract $k$. Implied by the function $w$ is that $\mu_k \succeq \sigma$ (Lemmas 1 and 2) and that contextual evidence is allowed if only if $\sigma > \sigma^E$ (Lemma 3). Thus, we have

**Proposition 1**: The optimal interpretive rule and the relationships’ equilibrium behavior solve, for each $T \subset \Lambda$, the problem of selecting $\mu_0^T, \mu_1^T, \mu_2^T, ...$ to maximize

$$\sum_{k=1}^{\infty} \left[ w(\mu_k^T) - \mu_k^T y_k \right]$$

subject to $\sum_{k=0}^{\infty} \mu_k^T = T$ and $w(\mu_k^T) \geq \mu_k^T y_k$ for every $k$. In the solution to this problem, for each $T \subset \Lambda$ there is an integer $K^T$ such that contracts $k = 1, 2, ..., K^T$ are precisely the contracts chosen by various types in the set $T$.

**Remark 1**: The external enforcer effectively chooses the types that select the various contracts. His choice determine how each subset $T_k$ forms, though the exact set of types that compose $T_k$ is indeterminate; it is the mass of the types included in the set that matters. The last condition of the Proposition ensures that each type of relationship will pay the cost of the contract meant for it.

**Remark 2**: When a relationship type considers whether to contract, the type knows its
own context as well as the interpretive rule that the enforcer later will apply. The thus anticipates, for every contract in the possible set of contracts, when the enforcer will order the buyer to make a transfer without evidence and when the enforcer will admit evidence. Every type realizes that the enforcer will not order a positive transfer under contract $k$ if $x \notin T_k$. Hence, sellers in relationships that fail to use the contract meant for their type have no incentive to provide effort, but then their contract would not increase value. The enforcer’s goal, recall, is to maximize welfare over the set of contractual relationships. Therefore, an optimal interpretive rule induces types to choose optimal contracts.

**Remark 3:** The welfare term in Proposition 1 is net of evidence costs and the second term reflects contracting costs. Recalling Lemma 1, the optimal interpretive rule induces some potential relationships not to make contracts. The cost to these types of describing context in a contract and supplying more context at trial exceed the gains from better effort incentives. Therefore, in this model the optimal interpretive rule is second best efficient regarding describability. Parties contract only when description is cost justified, but there would be more efficient contracts if costs were lower.

**Remark 4:** There may be multiple optimal interpretive rules. We let $W(c, y, s, \Lambda, \gamma)$ give the aggregate welfare of the population of relationships under an optimal interpretive rule, as a function of the model’s parameters.

### 3.4 A Simple Example with Bounded Language Size

Consider a case with a bound on language so that $y_k = 0$ for every $k = 1, 2, ..., K$, for some positive integer $K$, and where $y_k$ is very large for $k > K$. We can call $K$ the size of the language. Then it is optimal to have the population of relationships utilize all $K$ of the low-cost contracts to
distinguish themselves. If we further assume that \( \gamma \) is close to zero — introducing evidence is cheap — then it is optimal to allow evidence \( (\sigma^e = 0) \). Concavity of the function \( w \), which follows from concavity of \( v^e \), then implies that it is optimal to have \( \mu_1^T = \mu_2^T = ... = \mu_K^T \). In words, the sets of types that select the various contracts are, in equilibrium, the same size. If \( K\sigma < |T| \) then a mass \( |T| - K\sigma \) of types in \( T \) will not contract (that is, they will choose \( k = 0 \)) and we have \( \mu_k^T = \sigma \) for every \( k = 1, 2, ..., K \). Since evidence would be allowed, it is the language that prevents these types from describing what they would like to trade. Otherwise, all types in \( T \) form contracts and \( \mu_k^T = |T|/K \) for every \( k = 1, 2, ..., K \). This in the top figure on the following page.
The case of $\sigma^E = 0$.

The case of $\sigma^E > 0$. 
If $\sigma^E > 0$ ($\gamma$ is not sufficiently close to zero), the function $w$ is not concave because it is the upper envelope of $v^E$ and $v^N$ as shown in the right frame of the Figure above. Here, depending on $|T|$ and the location of $\sigma$, the optimal interpretive rule may specify that contextual evidence is allowed for some contracts but disallowed for others. This would arise, in particular, if $|T|/K$ is close to $\sigma^E$. The bottom figure above illustrates this case.

4. Expertise, Language Costs, and Externalities

We consider how the aggregate value of relationships under the optimal interpretive rule depends on contracting costs and the external enforcer’s expertise.

**Proposition 2:** Social welfare $W(c, y, s, \Lambda, \gamma)$ is weakly (a) decreasing in the vector $y$; (b) increasing in $s$; (c) decreasing in $\gamma$; and (d) increasing as $\Lambda$ becomes more refined.

**Proof:** For each parameter shift described, welfare would weakly rise under the optimal interpretive rule prescribed for the original parameter values (before the shift). By adjusting the interpretive rule to its new optimum, $W$ remains the same or increases further. In particular, a relationship is less able to communicate its type when contracting costs increase ($y$). Further, the enforcer becomes more accurate as he is better able to infer type from a physical performance ($s$ is high); as evidence production cost falls ($\gamma$); and as the enforcer is better able to infer type from public information ($\Lambda$ is a finer partition of the type space).

There is an issue, relevant to policy, regarding how contractual language and the external enforcer’s expertise interact. These could be *complements*: the marginal benefit of a less costly
language is increasing in the level of the enforcer’s expertise. Alternatively, expertise and language could be substitutes: the marginal benefit of a larger language is decreasing in the level of expertise. It is difficult to obtain results on the relation between expertise and language in a local sense (for small parameter shifts), but there is a straightforward and intuitive relation for large parameter shifts. Furthermore, probatory depth and technical sophistication behave differently in relation to language.

**Proposition 3**: For sufficiently large parameter shifts, (a) technical sophistication (measured by \( \Lambda \) and \( \gamma \)) and improved language (lowering contracting costs) are substitutes; (b) probatory depth and improved language are complements.

**Proof**: For a fixed value of \( s \), given the constraints in the model, an upper bound on the effort level that can be induced is the value \( q^H \) that solves \( s = c'(q^H) \). This follows from the seller’s first-order conditions in both the evidence and no-evidence cases; in fact, \( q^E \) achieves this bound and \( q^N \) is generally below it. Let \( v^H = q^H - c(q^H) \) denote the joint value for a relationship in this case, gross of contracting costs and without evidence costs. With \( s \) fixed, \( v^H \) is a type’s highest possible joint value.

Respecting part (a) of the Proposition, start from any given values of the other parameters. As \( \Lambda \) approaches the maximally fine partition, the seller’s effort comes arbitrarily close to \( q^H \), so that the relationship’s joint value comes arbitrarily close to \( v^H \). The same result also obtains if the components of \( y \) converge to zero, so that relationships could distinguish themselves finely by their contract selection. Thus, \( \Lambda \) and \( y \) are substitutes in the large.
Respecting part (b), that probatory depth— expertise with respect to $s$ — is a complement for large parameter shifts follows from the observation that an almost efficient level of effort $q^*$ can be induced only if $s$ is close to 1 and at least one of the other shifts just discussed occurs. As to the intuition, recall that $x$ is the productive outcome (what the seller did). If the seller performed appropriately (quality is high), the enforcer observes $t$ with probability $s$; otherwise, $x$ is uniformly distributed over $[0, 1]$ and thus is uninformative. If the seller did not perform properly, $x$ is again uninformative. Hence, a low $s$ when the seller produces high quality is equivalent to the case in which the seller produces low quality. As a result, a seller cannot be given good incentives unless $s$ is high. But if $s$ is high, then welfare can be enhanced by improving any of the other parameters. Hence, probatory depth and an improved contracting language (or a finer partition) are complements.

**Remark 5:** Proposition 3 shows that an enforcement system can be improved by making large improvements in the available language (lowering contracting costs) and by increasing the enforcer’s expertise. The Truth in Lending Law, for example, greatly lowered contracting cost by requiring firms to quote interest rates in the form of an annual percentage rate. Such state created formulas are public goods; the analysis here suggests that they may be under-provided. Improving enforcer expertise may be more challenging, but an enforcement system can function effectively with either an expert enforcer or a rich language; it is not necessary to have both. On the other hand, probatory depth is a necessary condition for achieving high aggregate welfare.

5. Multiple External Enforcers

There is a welfare benefit to having multiple enforcement systems, such as courts and arbitration panels, in our model. To see why, realize that language relating to adjudication
procedure is relatively acontextual. Consider the phrase “disputes under this contract will be resolved in binding arbitration”. An enforcer needs little context to know that, if society supplies courts and an arbitration system, the parties prefer arbitration. Hence, a contracting relationship can (almost) costlessly and effectively specify their choice of enforcer when more than one exists.

Suppose then that there are two enforcers: E1 and E2. Unless they are identical in all respects, the selection of enforcer can serve to signal something about a relationship’s type. Thus, in equilibrium, a fraction of types will contract for E1 and a fraction will contract for E2. To see why, consider the case in which the two enforcers have identical levels of expertise. Let $y$ denote contracting costs in a setting of a single enforcer. Then we can represent the presence of the two enforcers in terms of an adjusted cost structure in the basic model: $y'$, where for each even integer $k$ we have $y'_k = y_{k-1}' = y_{k/2}$. In words, each of the first two contracts costs $y_1$ to write, the first specifying E1 and the second E2; the next two contracts cost $y_2$ to write, one specifying E1 and the other E2; and so on. The presence of multiple enforcers thus expands the available language by lowering contracting costs (because $y_k$ increases with $k$). Welfare therefore increases. Multiple enforcement systems always raise welfare in equilibrium, as long as $s$ is not significantly lower, and $\gamma$ is not higher, for the entrant enforcer. How relationships divide between enforcers is indeterminate; that is, there are multiple equilibria where the enforcers use different interpretive rules.

**Proposition 5:** Consider an enforcement system E1 in which the enforcer lacks perfect direct information about types ($\Lambda$ is not the most refined partition), and in which it is costly to produce
evidence. (a) For any additional enforcement system $E_2$ that has the same values of $s$ and $\gamma$, both external enforcers get positive shares of the relationship types in equilibrium if the enforcers use optimal interpretive rules; (b) Aggregate welfare is strictly higher than when only $E_1$ exists; (c) $E_1$ and $E_2$ optimally interpret contracts differently. (proof omitted)

**Remark 6:** Proposition 5 is consistent with the observation that in many industries a positive fraction of contracts contain arbitration clauses.

**Remark 7:** Proposition 5 may suggest that the best regime would have a single external enforcer who replaces terms such as “disputes will be resolved through binding arbitration” with more open terms that are interpreted differently (multiplying the language by two rather than designating which enforcer has authority). This suggestion may be sound if many substantive terms resemble the arbitration term, having a fixed meaning that cannot be re-engineered by enforcement systems. In this case, it would be easier to multiply language by having multiple enforcers rather than by trying to redefine the meaning of terms that are already fixed in society. It would be informative to continue the analysis by adding structure to represent societal limits on the range of interpretations possible for various contract terms.

6. Conclusion

6.1 Summary

Specific performance contracts can materially improve investment incentives if an external enforcer can observe the parties’ physical performance and recover enough information about the parties’ contracting context to know whether that performance is conforming. If the enforcer applies an optimal interpretive rule, the context condition often is met. The rule induces
relationship types to inform the enforcer by putting context information in their contracts and by introducing context evidence at trial. This is because a capable and well informed enforcer compels only those intra-party transfers the anticipation of which will cause types to invest efficiently. Complexity thus precludes (second best) efficient contracting only when the enforcement institution functions poorly. Otherwise, parties contract efficiently, all costs considered. Optimal interpretative rules thus ameliorate the describability problem that otherwise would deprive much ex ante contracting of purpose.16

6.2 Interpretation in courts

The external enforcers in our model pursue a substantive goal: to maximize welfare over sets of contracting relationships. Courts engage in what one of us has called “goal neutral interpretation”. See Schwartz and Scott (2009). The judge, that is, sees her function as recovering the parties’ intentions, whatever those intentions may have been. Goal neutral interpretation is consistent with efficiency because parties, under any enforcement system, write contracts to maximize expected gains. A court thus advances the parties’ goal when it recovers the contract the parties intended to write.

Nevertheless, the courts’ interpretive rules are likely to be suboptimal for two reasons. First, the court is unlikely to give parties as good incentives as the enforcers in our model give because the court is not trying to give incentives at all. Rather, the court is only trying to find

16We focus here on context, but contracts sometimes focus on outcome variables such the work to be performed. We do not distinguish between outcome-specified and context-specified contracts because language has no predetermined meaning in our model. Were a system of plain meaning to exist, however, contracts might make this distinction. If the outcome space is more complicated than the type space, a contract’s plain meaning likely would specify the type. If the outcome space is simple relative to the type space, then the contract would narrowly specify the outcome. But still, there would be a straightforward implication for how distinctions are made regarding context and this is what our model examines.
what the parties said. Thus, the set of cases in which it is optimal for the parties to have the
court hear evidence and the set of cases in which the court wants to hear evidence probably are
disjoint. Second, the enforcers in our model are “ideal” in the sense that they know the costs to
parties of introducing evidence and of writing contracts. Real judges are unlikely to be as well
informed.

This analysis suggests that the courts’ interpretive rules should be defaults. A default is a
rule that parties can vary by including instructions in their contract. There is no need for parties
to send interpretive instructions to an enforcer in our model. The enforcer and the parties have
the same goal — to maximize welfare — and the enforcer is competent to solve the relevant
maximization problem. The enforcer therefore admits evidence when admission is optimal and
excludes evidence when that is best. Relationship types have no need to instruct the enforcer
regarding the evidentiary base because the enforcer is their perfect agent. In contrast, courts are
not the parties’ perfect agents, and thus should permit parties to vary whatever interpretive rules
a goal neutral interpretive theory would otherwise imply.

6.3 Empirical Implications

We conclude by briefly sketching out some of the model’s empirical implications.

A. Parties give as many interpretive instructions to courts as current doctrine permits.
Contracts with arbitration clauses should contain fewer instructions. This is both because
arbitrators may have more expertise than courts and because arbitrators are more likely than
courts to share the parties’ contracting goals.

B. Contracts intended for arbitration should contain fewer whereas clauses than contracts
intended for courts. Whereas clauses communicate context information to enforcers. The more
knowledgeable the enforcer already is — i.e., the finer is the partition $\Lambda$ — the less need there is to include context information in the contract.

C. Parties should prefer arbitration when the seller’s physical performance is difficult to evaluate. The enforcer draws an inference as to the parties’ type from the performance. In the model’s language, the enforcer observes $x$ — the performance — and correctly infers that the type is $t$ with probability $s$. Recall that an interpretive rule cannot give close to efficient investment incentives unless $s$ is high. The better the enforcer is at inferring type from performance, the higher is $s$. Suppose that an arbitrator with industry knowledge is more expert — $s$ for him is higher — than a court is. Evidence also is believed to be cheaper to introduce in arbitration ($\gamma$ is low). Probatory depth — expertise with respect to $s$ — and $\gamma$ are complements. Hence, the probability that parties use arbitration should vary directly with the complexity of the seller’s performance.

References


