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CONTRACT'S ROLE IN RELATIONAL CONTRACT

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What role do contracts play in long-term relationships? Very little, if any, according to the relational contract literature. It is not the contract that induces promise keeping but the imposition of (or threat of imposing) relational or informal sanctions, such as suspension or termination of trade. Yet, in reality, parties in long-term relationships write elaborate contracts enforceable through litigation (often with vague, open-ended clauses such as "best efforts") or set up dispute resolution mechanisms that mimic formal adjudication processes. Why go through all that trouble if formal mechanisms are to be used rarely? This Article attempts to answer this question. The Article argues that formal sanctions have two important advantages that informal sanctions often lack. First, with formal sanctions, parties can design the remedy (for example, liquidated damages) and even the adjudica-

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tion process (for example, arbitration). Such flexibility allows them to decouple the deterrence benefit of the sanction from the cost of its imposition, and achieve a better deterrence cost-benefit ratio. With relational sanctions, by contrast, both the deterrence benefit and the execution cost are largely dictated by the value of future relationship: The more valuable the future relationship, the larger the deterrence benefit from threatening to terminate it, but also the larger the cost of carrying out that threat. Second, the formal adjudication process often uncovers evidence that parties and other market actors can use to better tailor relational sanctions. In fact, the desire to generate more accurate information might explain why contracting parties use vague, open-ended standards, such as “best efforts.” Recognizing these benefits but wary of inducing too much litigation, the most effective means for deterring breach of contract will often combine relational and legal sanctions, an approach commonly observed in the real world. The Article also shows how various empirical findings are consistent with the theoretical predictions and how the findings can inform courts in interpreting good faith obligations.

INTRODUCTION

A long line of legal scholarship has emphasized the prevalence and importance of using nonlegal, informal sanctions to deter misbehavior and maintain cooperation among private entities. Celebrated examples include the ranchers in Shasta County, the whalers in New England, the cotton traders in the South, the diamond merchants in New York, and even sophisticated commercial entities.¹ Particularly with re-

¹ The places where only informal sanctions are used (or where informal sanctions are the primary tools) are surprising and interesting. See Robert Ellickson, *Order Without Law: How Neighbors Settle Disputes* 185–88 (1991) [hereinafter Ellickson, *Order*] (ranchers in Shasta County); Lisa Bernstein, *Opting Out of the Legal System: Extralegal Contractual Relations in the Diamond Industry*, 21 *J. Legal Stud.* 115, 116 (1992) [hereinafter Bernstein, *Diamond*] (diamond merchants in New York); Lisa Bernstein, *Private Commercial Law in the Cotton Industry: Creating Cooperation Through Rules, Norms, and Institutions*, 99 *Mich. L. Rev.* 1724, 1737–39 (2001) [hereinafter Bernstein, *Cotton*] (buyers and sellers in the cotton industry); Robert Ellickson, *A Hypothesis of Wealth-Maximizing Norms: Evidence from the Whaling Industry*, 5 *J.L. Econ. & Org.* 83, 94 (1989) (whalers in New England); Stuart Green, *Plagiarism, Norms, and the Limits of Theft Law: Some Observations on the Use of Criminal Sanctions in Enforcing Intellectual Property Rights*, 54 *Hastings L.J.* 167, 196–97 (2002) (academic plagiarism); Stewart Macaulay, *Non-Contractual Relations in Business: A Preliminary Study*, 28 *Am. Soc. Rev.* 55, 61–62 (1963) (commercial entities relying primarily on reputational sanctions); Dotan Oliar & Chris Sprigman, *There’s No Free Lunch (Any-*

spect to the last group, Professor Stuart Macaulay famously posed the questions: What good is contract law? Who uses it? When and how?² Based on surveys of corporate executives, he found that commercial parties in long-term relationships rarely relied on, or even looked at, the written agreement.³ Instead, according to the survey respondents, they performed obligations out of the need to preserve a reputation as a good business partner, as someone who could be trusted with future deals.⁴ Inspired by such observations, research by several influential scholars led to the birth of what is known as the “relational contract” theory,⁵ which fundamentally questions what role, if any, contract law plays in promoting and maintaining trade.⁶

While the relational contract theory has had much influence on the legal scholarship over the past fifty years, some important questions have remained unanswered: If the parties perform obligations, or fulfill their promises, out of the fear of reputational or relational sanctions, why do they bother to write enforceable formal contracts in the first place? Why do they often set up private dispute resolution mechanisms with bells and whistles that resemble those of court-based litigation? After all, writing a long-term commercial agreement or setting up a dispute reso-

more): The Emergence of Intellectual Property Norms and the Transformation of Stand-Up Comedy, 94 Va. L. Rev. 1787, 1812–21 (2008) (stand-up comedians); Barak D. Richman, How Community Institutions Create Economic Advantage: Jewish Diamond Merchants in New York, 31 Law & Soc. Inquiry 383, 400–05 (2006). For theoretical and doctrinal analyses of relational contracts, see, e.g., David Charny, Nonlegal Sanctions in Commercial Relationships, 104 Harv. L. Rev. 373, 426–43 (1990); Robert Cooter & Ariel Porat, Should Courts Deduct Nonlegal Sanctions from Damages?, 30 J. Legal Stud. 401, 401 (2001); Charles J. Goetz & Robert E. Scott, Principles of Relational Contracts, 67 Va. L. Rev. 1089, 1114 (1981); Ian Macneil, Contracts: Adjustments of Long-Term Economic Relations Under Classical, Neoclassical, and Relational Contract Law, 72 Nw. U. L. Rev. 854, 875–83 (1978) [hereinafter Macneil, Adjustments]; Alan Schwartz, Relational Contracts in the Courts: An Analysis of Incomplete Agreements and Judicial Strategies, 21 J. Legal Stud. 271, 273–74 (1992); Robert Scott, The Case for Formalism in Relational Contract, 94 Nw. U. L. Rev. 847, 848 (2000) [hereinafter Scott, The Case for Formalism]; Robert Scott, Conflict and Cooperation in Long-Term Contracts, 75 Calif. L. Rev. 2005, 2034–54 (1987).

² Macaulay, *supra* note 1, at 55 (commercial entities relying primarily on reputational sanctions).

³ *Id.* at 59.

⁴ *Id.* at 62–63.

⁵ See Macneil, Adjustments, *supra* note 1; Ian Macneil, Relational Contracts: What We Do and Do Not Know, 1985 Wis. L. Rev. 483 [hereinafter Macneil, Relational Contracts]; Ian Macneil, Values in Contract: Internal and External, 78 Nw. U. L. Rev. 340 (1983) [hereinafter Macneil, Values in Contract].

⁶ See Macneil, Adjustments, *supra* note 1; Macneil, Relational Contracts, *supra* note 5, at 484; Macneil, Values in Contract, *supra* note 5, at 341–43.

lution system is not free. The parties haggle over terms and procedures, they hire lawyers, and they send multiple drafts back and forth. That is a lot of trouble if, in fact, the formal contract or the dispute resolution process will not be used or will be used rarely. What role does the formal contract and the accompanying dispute resolution mechanism play in an “informal” relationship? What is the relationship between the formal sanctions available under the contract and the informal sanctions that are utilized outside the dispute resolution system?

This Article will attempt to answer some of these puzzles with the help of a simple repeated game model. The basic problem is that contracting parties in a long-term arrangement need a mechanism to control opportunism. Imagine a buyer and a seller engaged in a sale of goods transaction. Both the buyer and the seller fear that the other will take the benefit of the exchange and then not live up to her end of the bargain. The seller might take the buyer’s cash and provide a substandard product or service in return. The buyer might take delivery on credit and subsequently not pay on time, perhaps arguing opportunistically that the delivered good is nonconforming. To assuage these fears and thereby promote a mutually beneficial relationship in the long run, both the buyer and the seller must anticipate and suffer negative consequences for a decision not to honor commitments.

In a long-term relationship, these negative consequences could flow from (1) formal or legal sanctions, such as monetary damages imposed by a court or arbitrator following a lawsuit; (2) informal or relational sanctions, such as the suspension or termination of trade; or (3) a combination of the two. To make the analysis interesting and realistic, we consider settings where both legal and relational sanctions are costly to impose. Legal sanctions, on the one hand, require spending resources, including time, money, and opportunity cost on dispute resolution. Relational sanctions, on the other hand, involve failure or refusal to trade even when trade may be beneficial.⁷ Indeed, imposing relational sanc-

⁷ We focus on informal sanctions that involve no trade (or boycott) to make the analysis easy to follow. There are, of course, other possible informal sanctions. A firm who fails to meet its commitments today might be forced to drop its price to “win” back its customers. It may also have to offer a more generous warranty (or liquidated damages) or other favorable nonprice attributes. From the firm’s perspective, what is important is the tradeoff between its own, private cost of informal sanctions (determined by the reduction in profit) and the benefits of deterrence. Generous warranties, for instance, will induce more frequent litigation and engender additional litigation costs, and the size of the additional cost will determine the size of the deterrence benefit (especially when the firm can “back out” generous warranty pay-

tions often means switching contracting partners and incurring the startup costs of a new relationship. In theory, parties would desire a system that deters opportunistic conduct at the lowest possible cost, understanding that neither sanction is free. When both types of sanctions are costly, it is a priori unclear which sanctions the parties will rely on more heavily in a given relationship.

Notwithstanding the theoretical indeterminacy, this Article will show that legal sanctions have two benefits that relational sanctions often lack. First, parties can decouple the deterrence benefit of a legal sanction from its execution cost. Relational sanctions deter misconduct largely by taking away (or threatening to take away) the benefits or the surplus from future transactions: Parties behave because they do not want to lose future business. The larger the value of the future business, the more the threat to take it away will cause a party to think twice about renegeing. At the same time, the larger the value of the future transactions between the two parties, the higher the cost the parties suffer if they have to actually execute the threat by stopping or suspending that relationship. In short, the deterrence benefit and the execution cost of informal sanctions are closely intertwined.

The story, however, differs for legal or formal sanctions. When the parties adopt monetary damages as formal sanctions, for instance, the amount of deterrence is largely dictated by the size of the damages that the losing party has to pay. At the same time, the dispute resolution cost incurred by the parties will often be smaller than the damages. This will be particularly true since litigation is usually brought when the size of the (expected) recovery is larger than the (expected) cost of litigation. Furthermore, parties in a long-term relationship can contain the cost of dispute resolution, for instance, by using arbitration and through tailoring of rules on procedure and evidence, while keeping the size of the

ments with higher prices ex ante). Similarly, when the firm has to offer a lower price (for the same quality product), it suffers a reduction in profit and the size of that reduction will dictate the size of the deterrence benefit and the (private) cost of producing deterrence. On a related note, the price cut option has the potential to be an "efficient" punishment scheme; that is, it may be able to induce the seller to cooperate without generating any inefficiency due either to litigation or no trade. See Joseph Farrell & Eric Maskin, *Renegotiation in Repeated Games*, 1 *Games & Econ. Behav.* 327, 331 (1989). Creating such an efficient punishment mechanism, however, requires the parties to be quite patient. If they are not, relational sanctions will have to entail some inefficiency (such as litigation, boycott, or lack of cooperation). See *infra* note 103 and accompanying text for a more in-depth analysis on this issue.

promised monetary damages sufficiently large. Through proper tailoring of monetary recovery (for example, liquidated damages) and successful control of dispute resolution cost (for example, arbitration), formal sanctions can, on occasion, deter contractual opportunism at a lower cost than informal sanctions.

Furthermore, through the dispute resolution process, legal sanctions allow the parties to uncover relevant information that enables them to better tailor relational sanctions. One reason that relational sanctions are costly is that they can misfire. In an ideal world, transacting parties would be fully aware of one another's behavior and the relational sanctions would get carried out only when one misbehaves. In fact, termination of the relationship would never happen since, with sufficient deterrence, no one would misbehave. Unfortunately, knowledge and monitoring are imperfect in reality. Parties have to rely on indicators—rather than perfect knowledge—of misbehavior in imposing relational sanctions, and with imperfect indicators, relational sanctions will sometimes misfire. Examples are easy to find. A shoddy product by a manufacturer or an unsatisfactory experience at a restaurant is not necessarily the result of negligence or lack of care, but can nevertheless lead to a decrease in demand or a cessation of customer traffic.

Given the tendency of relational sanctions to misfire, transacting parties will naturally want to increase the reliability of any indicators of poor performance. A formal dispute resolution helps by allowing parties to use the resolution process to uncover relevant evidence of true behavior and to then condition relational sanctions on the more accurate indicators.⁸ For instance, instead of using poor quality as the only signal of misbehavior, the parties or other market actors might impose relational sanctions upon observing both poor quality and a judicial or arbitrator's finding of insufficient effort or bad faith. To the extent that the adjudicator's finding is correlated with the true behavior, any relational sanctions that follow a judgment will misfire less frequently and become a more effective deterrent.⁹ In fact, parties can induce the judge or arbitrator to

⁸ While we are emphasizing the informational benefits of litigation, information flow will often be bilateral. Contracting parties' current and past interactions can often provide beneficial information for the courts in determining breach and remedy. Indeed, the Uniform Commercial Code expressly sanctions the use of course of performance and course of dealing evidence to "explain and supplement" the writing. See U.C.C. § 2-202 (2013).

⁹ As is well known, the deterrence effect of any sanction increases with its accuracy; that is, how often "innocent" parties are correctly exonerated and "guilty" parties correctly con-

make findings about behavior by conditioning liability on fault-based standards, such as “best efforts” and “good faith” in the performance of a contract. In a long-term relationship, such terms can improve the performance of relational sanctions.

Although we emphasize these two important benefits provided by legal sanctions, there are, of course, costs to harnessing these advantages. Larger damages will likely induce larger litigation expenditure, either due to more suits being filed or because parties will spend more in any given suit. It may very well be the case that providing \$100 worth of deterrence through damages might actually require litigation expenditures of more than \$100. In such cases, the parties are better off relying more on relational sanctions. Similarly, adopting a fault-based and open-ended standard, such as “best efforts,” could lead to additional expenditure in dispute resolution, as parties will have to litigate over what the standard means and whether one or both parties have abided by that standard. This will cause the parties to think more carefully about the tradeoff between the informational benefit and the additional cost of dispute resolution, leading them, on occasion, to adopt a no-fault standard rather than a fault-based standard for determining breach.

This Article is organized as follows. Part I will review the existing scholarships on both relational contract theory and on nonlegal sanctions more generally. It also presents the unsolved puzzle over why formal sanctions *and* adjudication processes play an important part in many long-term relationships. Part II will present the main arguments of the Article in nontechnical language. It focuses on how formal sanctions operate differently from informal sanctions in terms of the deterrence cost-benefit calculus and various strategies that real-world parties have adopted to maximize the deterrence bang for the buck. This Part will also show the information benefits that using open-ended obligations, such as “best efforts,” can achieve. That analysis, in turn, leads to implications about the proper judicial interpretation of “good faith” in contractual performance. Part III will present a more formal analysis based on a repeated game model. It stylizes a long-term relationship between a buyer and a seller. The example shows how relying solely on either formal or informal sanctions will be suboptimal and how, in many cases, parties will want to rely on a combination of both types of sanctions. It

victed. See Louis Kaplow & Steven Shavell, Accuracy in the Determination of Liability, 37 J.L. & Econ. 1, 2–3 (1994).

also formally demonstrates the deterrence cost-benefit advantage and informational benefits of formal sanctions. The final Part will conclude.

I. EXISTING LEGAL SCHOLARSHIP ON NONLEGAL SANCTIONS

Early on, legal scholars recognized that parties in long-term relationships or in settings with repeat interactions could resort not only to legal but also to nonlegal sanctions to maintain cooperation and deter misbehavior. Professor Robert Ellickson, for instance, has famously documented that the ranchers in Shasta County, California, rarely, if ever, resort to legal means in resolving disputes.¹⁰ Rather, they rely on various types of self-help and informal enforcement mechanisms (such as tit-for-tat) to ensure that the members of the community cooperate with one another and to maintain order.¹¹ Similarly, Professor Lisa Bernstein has shown how New York diamond merchants and cotton traders in the South have opted out of the formal court-based system provided by the state.¹² Instead, these parties structure their own dispute resolution systems with tailored rules and often resort to more informal, nonlegal mechanisms—such as termination or suspension of trade with the party who has been found to have violated the rules—to enforce cooperation among members.¹³

Nonlegal and informal enforcement mechanisms play an important role for other commercially sophisticated entities as well. According to numerous interviews with corporate executives and lawyers conducted by Professor Macaulay, commercial entities in long-term relationships tend to resort more to nonlegal sanctions.¹⁴ According to the interviews, nonlegal sanctions range from expressing anger or deep dissatisfaction over defective performance to gossiping and spreading rumors about competitors, deliberately withholding or delaying payment for unsatisfactory performance, or maintaining a “report card” of suppliers and terminating or suspending relationships with those with too many “Ds” or “Fs” on the report card.¹⁵ In fact, although businesses often do enter into detailed contracts, they “use legal sanctions to settle disputes [only]

¹⁰ Ellickson, *Order*, supra note 1, at 40.

¹¹ *Id.* at 56–57.

¹² Bernstein, *Diamond*, supra note 1; Bernstein, *Cotton*, supra note 1.

¹³ See Ellickson, *Order*, supra note 1, at 56–57, 79–81; Bernstein, *Diamond*, supra note 1; Bernstein, *Cotton*, supra note 1.

¹⁴ Macaulay, supra note 1, at 55.

¹⁵ *Id.* at 63.

when other devices will not work and when the gains are thought to outweigh the costs.”¹⁶ Inspired by such observations, Professor Macaulay and others question the role contract law plays in actual transactions, leading to the birth of relational contract theory.

According to this theory, relational or informal enforcement becomes necessary (or the contract becomes “relational”) when writing a complete, state-contingent contract is either impossible or impractical.¹⁷ It is not difficult to imagine that planning for every contingency will be hard to do, if not impossible. The parties might be unable to anticipate every future contingency or planning and drafting for the event will take too much time and effort. As a result, contracts become incomplete and thus fewer contingencies are covered by the prospect of legal sanctions. As a result, parties often rely to some degree on relational or nonlegal sanctions to achieve desired results.¹⁸ Many (if not most) transactions are relational: They are incomplete and enforcement occurs to some extent by threats of nonlegal sanctions. Examples include long-term contracts for the sale of oil or gas, franchise agreements, exclusive dealing arrangements, and employment contracts. In each of these settings, the parties (1) fail to write a complete plan of action for every contingency and (2) anticipate the use of informal sanctions.

Unsurprisingly, given the importance of relational contracts in the economy, legal scholars have devoted substantial effort to understanding them. The literature separates into two strands. The first asks the normative question: How should courts interpret terms in a relational contract? On one side, scholars like Professors Robert Scott and Alan Schwartz advocate for a formalist interpretation.¹⁹ They argue that courts should refuse to fill gaps in the contract, thereby leaving room for the nonlegal sanctions to do much of the enforcement work.²⁰ On the other side, Pro-

¹⁶ *Id.* at 65.

¹⁷ See Scott, *The Case for Formalism*, *supra* note 1, at 847.

¹⁸ Because contracts are incomplete, scholars have often addressed the normative question of how courts should fill in the gaps. See, e.g., Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 *Yale L.J.* 87, 87 (1989); Lucian Ayre Bebchuck & Steven Shavell, *Information and the Scope of Liability for Breach of Contract: The Rule of *Hadley v. Baxendale**, 7 *J.L. Econ. & Org.* 284, 284–85 (1991); Goetz & Scott, *supra* note 1, at 1114; Alan Schwartz, *The Default Rule Paradigm and the Limits of Contract Law*, 3 *S. Cal. Interdisc. L.J.* 389, 390 (1993).

¹⁹ See Alan Schwartz, *Incomplete Contracts*, in 2 *The New Palgrave Dictionary of Economics and Law* 277, 277 (Peter Newman ed., 1998); Scott, *The Case for Formalism*, *supra* note 1, at 848.

²⁰ Scott, *The Case for Formalism*, *supra* note 1, at 848, 861–62.

fessor Ian Macneil advocates for a more aggressive judicial hand with less reliance on the terms of the original agreement.²¹

As discussed in the Introduction, the second strand of literature examines instances where parties rely on informal sanctions to foster promise-keeping.²² This strand often focuses on issues such as (1) what enables parties to opt out of state-sponsored legal enforcement and (2) what alternative dispute resolution procedures, if any, replace the ones offered by the state.

While much of the existing literature takes as given the existence of a relational contract or the use of social norms as the primary (if not the exclusive) means of inducing cooperation between contracting parties, basic questions remain unanswered. If relational or informal sanctions are the primary means of inducing cooperation, why do parties choose to have any formal contract at all? After opting out of the court-based adjudication system, why do some communities of traders nonetheless set up elaborate private adjudication systems to resolve disputes? More fundamentally, what role does law, either in the form of a formal contract or a private dispute resolution mechanism, play in long-term relationships or in settings where nonlegal, repeat-interaction-based sanctions can be readily deployed? We turn to these questions in the following Parts.

II. THE ROLE OF CONTRACTS IN LONG-TERM RELATIONSHIPS

This Article's central claim is that formal or legal sanctions have two underappreciated benefits when compared to informal or relational sanctions. First, by designing the remedy and the adjudication process, parties can decouple the deterrence benefit of the formal damage award from the cost of providing that deterrence. Second, formal sanctions can generate information that the parties or other actors can use to more carefully calibrate nonlegal sanctions. The main objective of this Part will be to explain our claims in nontechnical language with the help of actual case law and empirical evidence. In Section A, we will support

²¹ See Macneil, *Adjustments*, *supra* note 1, at 890 ("In a truly relational approach the reference point is the entire relation as it had developed to the time of the change in question (and in many instances as it has developed since the change). This may or may not include an 'original agreement;' and if it does, may or may not result in great deference being given it.").

²² See Ellickson, *Order*, *supra* note 1; Bernstein, *Diamond*, *supra* note 1; Bernstein, *Cotton*, *supra* note 1; Green, *supra* note 1; Macaulay, *supra* note 1; Oliar & Sprigman, *supra* note 1; Richman, *supra* note 1.

our claims using a recent case dealing with a long-term contract between two sophisticated commercial entities. In Sections B and C, we will refer back to various empirical cases analyzed by previous scholars and will show how our theory is consistent with their findings. In Section D, we will pivot to take a slightly more normative stance, explaining how our findings might aid the courts in imposing the contractual duty of good faith.

A. The Case of Silicon Power Corporation v. GE Zenith Controls

Let us first illustrate the main arguments with the help of a real-world relationship between two sophisticated commercial companies, Silicon Power Corporation and General Electric Zenith Controls, Inc.²³ In the early 2000s, Silicon Power Corporation (“Silicon Power”) was developing a new technology for transfer switches, called low voltage static transfer switches (“LVSTS”).²⁴ Often used in power generators, transfer switches swap out one power source for another in the event the first power source fails.²⁵ They are used anywhere a constant source of electric power is important, for instance factories, hospitals, transmission towers, and even Internet data centers.²⁶ Switching speed, as one might imagine, is critical for this technology. The faster the switching speed, the less likely there will be an interruption in the power supply.²⁷

After coming up with the basic design and developing the prototype of the LVSTS, Silicon Power wanted to both commercialize its product and enter the transfer switch market with an even newer technology. To accomplish these goals, Silicon Power entered into two agreements with General Electric Zenith (“GE Zenith”).²⁸ In the first agreement (called the “Joint Development Agreement,” or “JDA”), GE Zenith and Silicon

²³ *Silicon Power Corp. v. Gen. Elec. Zenith Controls, Inc.*, 661 F. Supp. 2d 524, 526 (E.D. Pa. 2009).

²⁴ *Id.* at 527.

²⁵ *Id.*

²⁶ See Response of General Electric Zenith Controls, Inc., to Motion to Vacate Arbitration Award at 8, *Silicon Power Corp. v. Gen. Elec. Zenith Controls, Inc.*, 661 F. Supp. 2d 524 (E.D. Pa. 2009) (No. 08-4331) (“Many industries, like data centers and hospitals, require continuous power to operate their equipment. In the case of a power interruption, a static switch moves to an alternate power source, such as a generator, in a fraction of a second. The change happens so quickly the equipment supported by the power source does not notice the disruption.”).

²⁷ *Id.*

²⁸ *Silicon Power*, 661 F. Supp. 2d at 527.

Power agreed to jointly develop ultra-fast LVSTS ready for mass production and commercialization.²⁹ The second agreement (called the “Sourcing and Distribution Agreement,” or “SDA”) made GE Zenith the exclusive distributor of Silicon Power LVSTS in the United States and Mexico for a five-year period.³⁰

The exclusive dealing arrangement (SDA) will be the focus of our story. It contained various sales “targets.” GE Zenith was first to obtain five to seven million dollars in orders before Silicon Power completed construction of transfer switches with the new technology.³¹ During the first twelve months following the construction, GE Zenith “was to obtain \$12 million in orders.”³² And, shortly thereafter, the goal was to capture “15% of the [transfer switch] market.”³³ These estimates were projections about entry into the transfer switch market, not promises by GE Zenith.³⁴ In case GE Zenith failed to meet the projections, under the contract, Silicon Power could first terminate the “exclusive” part of the exclusive dealing arrangement—that is, Silicon Power could allow someone else to sell its transfer switches.³⁵ In addition, the contract required both parties to meet and negotiate a “mutually agreeable solution,” and if they failed to do so within thirty days, either party could terminate the entire agreement.³⁶

Unfortunately, the market for Silicon Power transfer switches never took off. In fact, it declined sharply in the early 2000s. According to the district court involved in the eventual litigation, “GE Zenith did not have much success selling Silicon Power’s [transfer switch] products. GE Zenith fell significantly short on quote activity and on orders compared to the . . . targets. The relationship between the parties deteriorated significantly as a result.”³⁷ Eventually, Silicon Power filed a lawsuit, alleging breach of contract.³⁸ The dispute went to arbitration where GE Zenith prevailed.³⁹ The arbitrator made a number of specific findings about

²⁹ *Id.*

³⁰ *Id.*

³¹ *Id.* at 527–28.

³² *Id.* at 528.

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.* at 532–33 (citations omitted) (internal quotation marks omitted).

³⁸ *Id.* at 533.

³⁹ *Id.*

the level of effort GE Zenith devoted to selling the Silicon Power transfer switches. He also found that low demand for Silicon Power switches could be attributed to many sources, including changes in the overall market and the inability of Silicon Power to provide a workable switch for customers when GE Zenith did, in fact, negotiate an order.⁴⁰

The agreements between GE Zenith and Silicon Power had all the characteristics of relational contracts. They involved both distribution of an existing technology and the joint development and marketing of a new technology. The SDA contemplated a five-year term. The SDA did not specify the level of effort GE Zenith would use in trying to sell Silicon Power equipment across all future contingencies. Instead, the agreement specified sales “targets.” Indeed, GE Zenith was reluctant to legally commit to actual numbers because it did not know what the future market for transfer switches would look like. In many ways, the contract was incomplete and the parties would have to resort to relational means in achieving desired results. At the same time, however, the contracts did stipulate sales targets and other legal obligations on both parties. Such obligations would have been unnecessary if the parties viewed relational sanctions alone as sufficient to enable them to establish a workable relationship and deter opportunistic behavior.

1. Maximizing the Deterrence Bang for the Buck

In order to maximize their joint, long-run surplus of the relationship, the parties needed to deter GE Zenith from shirking its sales effort. Specifically, GE Zenith needed some way to commit to working hard (“co-operate”) to maximize the future sales of Silicon Power technology, and Silicon Power needed some way to hold GE Zenith accountable for its choice of effort. Silicon Power presumably lacked the capacity to perfectly observe GE Zenith’s effort. It could not tell exactly how much effort GE Zenith put into making sales. To solve this monitoring problem, the parties agreed to (potentially) impose legal and relational sanctions against GE Zenith in case of low sales. In particular, Silicon Power had the ability to terminate the relationship, particularly the exclusivity component, for low sales, an informal or relational sanction. It could also—as it eventually did—file a lawsuit alleging breach of contract, a formal or legal sanction.

⁴⁰ Id. at 530–31.

Why were informal sanctions insufficient to solve the commitment problem? Why did the parties enter into a contract that allowed Silicon Power to bring a formal lawsuit against GE Zenith? The answer, we suspect, lies in the parties' attempt to maximize what we have been calling the deterrence bang for the buck. Let us think about the costs and benefits of two kinds of sanctions. First, for relational sanctions, if GE Zenith shirked, it was more likely to fail to meet the targets, and failure to meet the targets provided grounds for termination of the exclusive dealing arrangement. The deterrence "bang" associated with termination depended on how large of a benefit the exclusive dealing arrangement provided going forward. If the arrangement provided little benefit, the threat to take it away would not do much to motivate GE Zenith. If the relationship had lots of value going forward, the threat to take it away could be quite powerful. At the same time, if the relationship had lots of value as a going concern, terminating would impose a large cost on Silicon Power. Both the size of deterrence from termination and Silicon Power's cost of executing that threat turned on the value of the ongoing relationship. In other words, the costs and benefits of termination were closely correlated.

By way of contrast, now let us think about the threat of a lawsuit: the formal, legal sanction. Like termination, a lawsuit was more likely if GE Zenith failed to hit the targets. And such a failure was more likely if GE Zenith shirked. The deterrence "bang" of the formal sanction, on the other hand, turned on, among others, the size of the damages award. The larger the damages available for breach of contract, the more GE Zenith would be motivated to work hard at hitting the targets. At the same time, however, the cost to Silicon Power of using the formal sanctions is not the damages award, but instead its own cost of litigation. Imagine that Silicon Power could file the lawsuit cheaply; the in-house counsel was a talented former litigator, perhaps. In that case, the cost of using the formal sanction might be (substantially) smaller than the deterrence benefit that formal sanctions provide. Unlike with relational sanctions, Silicon Power and GE Zenith could decouple the costs and benefits of the formal sanctions, enabling them to attain a better deterrence bang for the buck.

Of course, we do not want to blindly emphasize the virtues of legal sanctions without also thinking about downsides. With higher damages available for a breach of contract claim, the parties are apt to spend more resources on litigation, and it is plausible that (at the margin) the deter-

rence cost-benefit ratio might have been worse than that of relational sanctions. Perhaps Silicon Power might have found bringing a formal enforcement too costly, given only expectation damages were available. It is precisely at these moments, then, that Silicon Power would find it more efficient to pull the trigger quickly on terminating the relationship in the face of disappointing sales. Simply put, by having both types of sanctions in their toolbox, the parties could resort to whichever type that provides the best deterrence bang for the buck. This, in turn, helps explain why the contracting parties expressly allowed for—and contemplated—both types of sanctions.

2. Information Generation

The second benefit of formal sanctions is the generation of relevant, previously unavailable information. In the arbitration between Silicon Power and GE Zenith, while declining to impute “best efforts” into the SDA,⁴¹ the arbitrator did make detailed findings to determine whether GE Zenith was in breach of its good-faith obligations toward Silicon Power. Citing the arbitrator, the district court emphasized that:

- (1) “GE Zenith put considerable effort into marketing Silicon Power’s [transfer switch] products. GE Zenith assigned Tim Cole as the product manager. . . . Cole has a degree in civil engineering and an MBA. . . . Cole spent about 80% of his time on the [Silicon Power products].”⁴²
- (2) “GE Zenith and Silicon Power held three training sessions for GE Zenith’s sales team in October and November 2001.”⁴³
- (3) “GE Zenith’s sales representatives and manufacturers’ representatives did engineering lunch-and-learns to promote the [Silicon Power products].”⁴⁴

⁴¹ According to the district court, the arbitrator explained that, since the SDA provided that Silicon Power could terminate GE Zenith’s exclusive rights, or terminate the contract entirely, if GE Zenith failed to meet its sales targets for any three month period, the SDA was not the type of exclusive dealing contract for which New York law implies a best efforts obligation. *Silicon Power*, 661 F. Supp. 2d at 533–34. Presumably, this implies that the SDA is out of the realm of U.C.C. § 2-306(2) (2014), which imposes the obligation of “best efforts” in exclusive dealings contracts “unless otherwise agreed.”

⁴² See *Silicon Power*, 661 F. Supp. 2d at 528–29 (citations omitted).

⁴³ *Id.* at 529.

⁴⁴ *Id.* (internal quotation marks omitted).

- (4) “GE Zenith . . . ran incentives with its manufacturers’ representatives to make sure we were getting our fair share of the sales guys’ marketing time. In addition, GE Zenith encouraged its sales representatives to promote the Silicon Power [product] even in instances where they knew that another product had been specified by the architect or engineer.”⁴⁵
- (5) “Evidence was presented . . . that Silicon Power . . . products that GE Zenith sold to three customers failed catastrophically.”⁴⁶
- (6) “GE Zenith sold a Silicon Power [transfer switch] to Bridge Securities in South Korea. That switch failed in October 2003, causing the South Korean stock exchange to shut down.”⁴⁷
- (7) “[M]any customers who had previously purchased [transfer switch] products for data centers began to resell them just like new in 2002, depressing the price for new [transfer switch] products. Consequently, in early and mid-2003, GE Zenith learned that all of its quotes were priced too high because the market had collapsed.”⁴⁸

Produced by the litigation, these findings explain why GE Zenith could not sell Silicon Power equipment. The equipment was mispriced and malfunctioned. The findings make plain that a shirking GE Zenith did not cause the disappointing sales. The potential to obtain damages for breach of contract led Silicon Power to file the lawsuit. The lawsuit produced information about what transpired, specifically whether GE Zenith was to blame for the low sales. To prevail in litigation, Silicon Power had to prove a lack of good faith on the part of GE Zenith. Low sales were not enough. They had to link the low sales to low effort on the part of GE Zenith.

Given that Silicon Power and GE Zenith had completely terminated their relationship, the uncovered information may not have been of immediate value to Silicon Power. But, it can play an important role in controlling the behavior of other market participants. Termination (or suspension) of the relationship is one type of relational sanction, but not

⁴⁵ Id. at 530 (citation omitted) (internal quotation marks omitted).

⁴⁶ Id. at 531.

⁴⁷ Id. at 532.

⁴⁸ Id. at 530 (citation omitted) (internal quotation marks omitted).

the only one, or perhaps even the most significant one. GE Zenith's failure to sell Silicon Power equipment might make other equipment sellers (or other power switch developers) reluctant to deal with GE Zenith in the future. By exonerating GE Zenith, the outcome of the litigation allows these other market actors to rest easy and feel more comfortable dealing with GE Zenith. If, on the other hand, the arbitrator had found that GE Zenith shirked its effort or acted in bad faith, other market actors would be more hesitant in dealing with GE Zenith. Simply put, litigation over effort can produce information that allows for a better tailoring of the market's reaction to poor performance. That, in turn, makes the market-based or relational punishment more effective.⁴⁹

In closing this Section, two remarks are worth making. Silicon Power and GE Zenith did not settle, possibly due to the fact that they disagreed on the cause of the poor sales. Most times, especially when there are no informational barriers to settlement, the parties do not wait for the judge to determine what accounts for poor performance. If they are informed of each other's behavior, they can better tailor relational sanctions on their own without the help of litigation. Furthermore, the final judgment is not the only way a dispute resolution can produce useful information. The parties or other market actors can use any signal from the judge or the arbitrator about the underlying behavior. The parties might suspend trade in response to the denial of the seller's summary judgment motion or the buyer's motion to dismiss. All that matters is that the judicial signal (or the signal from the dispute resolution process) contains some useful, albeit noisy, information about the parties' actual behavior.⁵⁰

⁴⁹ Another important advantage of information production through dispute resolution may be in controlling an agent's behavior within an organization. Presumably, the bulk of the sales efforts were undertaken by lower-level employees while the decision to either proceed with the relationship (or to defend the lawsuit) was being made at a more senior level within GE Zenith. If the senior executives are unaware of whether GE Zenith's salespeople did indeed do their best in promoting Silicon Power's switches, they will have a more difficult time managing their relationship with Silicon Power: An agency problem arises due to lack of information. The threat of litigation can allow the senior executives to better control the behavior of the sales personnel. This can also explain why many employment contracts include open-ended, vague standards such as the obligation to put in "best efforts," often in addition to an explicit incentive scheme. See Albert Choi & George Triantis, *Completing Contracts in the Shadow of Costly Verification*, 37 *J. Legal Stud.* 503, 506 (2008) [hereinafter Choi & Triantis, *Completing Contracts*]; Albert Choi & George Triantis, *Strategic Vagueness in Contract Design: The Case of Corporate Acquisitions*, 119 *Yale L.J.* 848, 888–89 (2010) [hereinafter Choi & Triantis, *Strategic Vagueness*].

⁵⁰ When market participants' relational sanctions are a concern, parties might want to settle quickly and quietly to suppress the bad information from being released to the market.

Second, the litigation for breach of contract in the case involved two issues, first on whether performance was poor and second on the reasons for such poor performance. Given two issues are in dispute, any litigation is apt to be more expensive. It is probably a lot easier to show that GE Zenith failed to meet the sales target than to demonstrate both that failure and the reasons behind it. Obviously, incorporating additional litigation expenses renders contractual liability rooted in effort—or fault-based liability—a less attractive option. The benefit of better formal sanctions and less frequent informal sanctions remains, however. With additional expenses, the calculus would entail trading off these additional benefits against the higher cost of litigation.

B. Evidence on Decoupling Deterrence Benefit from Cost

In this and the next Section, we will show how our theoretical findings are consistent with the existing empirical evidence. We start with Professor Lisa Bernstein's famous study of the diamond market. Professor Bernstein documents how buyers and sellers in the diamond industry in New York have opted out of public enforcement of contracts.⁵¹ Instead, for formal sanctions, they use a private arbitration system operated through the New York Diamond Dealers Club. Details of any arbitration are kept secret. The Club's bylaws, however, provide "[a]ll decisions of arbitration panels including floor committee arbitrations which are not complied with within 10 working days, together with the picture of the noncomplying member, shall be posted in a conspicuous place in the Club rooms."⁵² Unlike a state court, the arbitration panel lacks the ability to enforce the judgment on its own. It cannot order, for instance, foreclosure of property or garnish the wages of parties who breach contracts.

In this market, both formal and informal sanctions attach to opportunistic conduct. Jilted sellers and frustrated buyers can file a grievance with the arbitration panel. They can also refuse to deal with the opportunistic counterparty going forward. Reliance on formal sanctions at all

Given this incentive, quick and quiet settlement could carry an unnoticed cost across the range of all contracting parties in the long run because it may make any relational sanction less accurate. Barriers to a settlement, such as lack of symmetry in information, might not actually be as costly as they first appear because the lack of settlement could lead to better, more accurate relational sanctions.

⁵¹ Bernstein, *Diamond*, supra note 1, at 115, 117.

⁵² *Id.* at 128.

is surprising in this market. After all, the buyers and sellers all know one another; they run in the same social and business circles. Informal sanctions can include preclusion from future social and business transactions. Given the potential power of informal sanctions, why go to the trouble of forming an arbitration panel and hearing grievances? The ability of formal sanctions to decouple the deterrence benefit from its cost provides one rationale for why this close-knit community still relies partly on formal sanctions.

A second observation is that the arbitration panel has the ability to ratchet up any award to include punitive damages. At first blush, this practice appears puzzling, since the parties may want to limit damages and rely more on informal sanctions when litigation is costly. Notably, the diamond industry draws arbitrators from industry insiders. As experts, they can perhaps better balance the tradeoffs between formal and informal sanctions appropriately if the parties fail to do so themselves. Empowering the arbitration panel to adjust the award up or down might make sense, however: With this flexibility, the arbitrators can opt for relatively more or relatively less reliance on formal sanctions, perhaps on a case-by-case basis. The arbitrators could tie the balance between the informal and formal sanctions to the needs of parties. More important, the combination of using a less rule-heavy arbitration system and allowing punitive damages can be seen as evidence of an attempt to maximize the deterrence bang for the buck. The threat of punitive damages provides a lot of deterrence. The cost of arbitration could be controlled by having fewer procedural hurdles in arbitration.

Like the diamond industry, the cotton industry relies on a combination of formal and informal sanctions. Generally, buyers and sellers of cotton do not call on the courts for the enforcement of contracts; they rely on arbitration. In cotton transactions, trade rules—not the provisions of the Uniform Commercial Code (“UCC”)—govern transaction disputes and set the default rules. The Southern Mill Rules apply in merchant-to-mill transactions and grant “market difference damages plus a one-half cent per pound penalty.”⁵³ Unlike in the New York diamond market, consequential damages are not available.⁵⁴ Rules from the regional trade associations or the Memphis Cotton Exchange apply to

⁵³ Bernstein, Cotton, *supra* note 1, at 1733.

⁵⁴ *Id.*

most merchant-to-merchant transactions. These rules limit relief to market damages, disallowing broader relief based on, say, lost profits.

Here the cap on damages controls litigation costs, albeit by sacrificing some of the deterrence bang of the legal sanctions. Notably, the trade rules control litigation costs in other ways too. The arbitrators use a “relatively formalistic adjudicative approach that gives little explicit weight to elements of the contracting context.”⁵⁵ The rules do not allow arbitrators to inquire into course of dealing, course of performance, or trade usage; each inquiry ramps up the potential litigation costs for the parties. Professor Bernstein finds that “[i]n practice . . . arbitrators only look to custom when there are no trade rules or contract provisions on point.”⁵⁶ In the end, cotton buyers and sellers appear to use an inexpensive formal remedy system along with threats of informal sanctions.

C. Evidence on Information Generation

We start with the regression-based studies. One empirical study of venture capitalists (“VCs”) finds that “litigated [venture capitalists] suffer declines in future business relative to matched peers.”⁵⁷ The key empirical move made by the authors was to benchmark litigated VCs against a group of VCs, which was similar in almost all respects except that VCs in that group did not face litigation. They find that litigated VCs suffered a decline in future business relative to the benchmark group. This provides evidence that the same event—a lawsuit—can result in both formal sanctions and reputational harm going forward. A second study considered whether franchisors that faced litigation experienced declines in future growth.⁵⁸ The authors found that “franchisor litigiousness is associated with lower levels of expansion goals.”⁵⁹ Again, the empirics suggest future business partners take into account the franchisor’s “litigation” record in deciding whether to do business. Prior liti-

⁵⁵ Id. at 1735.

⁵⁶ Id. at 1736.

⁵⁷ Vladimir Atanasov, Vladimir Ivanov & Kate Litvak, Does Reputation Limit Opportunistic Behavior in the VC Industry? Evidence from Litigation Against VCs, 67 *J. Fin.* 2215, 2215 (2012).

⁵⁸ Kersi D. Antia, Xu (Vivian) Zheng & Gary L. Frazier, Conflict Management and Outcomes in Franchise Relationships: The Role of Regulation, 50 *J. Marketing Res.* 577 (2013).

⁵⁹ Id. at 586.

gation is information that market actors consider relevant to their business deals.⁶⁰

The diamond merchants studied by Bernstein provide yet another example of the informational benefits of litigation. There, as noted, buyers and sellers form a close-knit community. They know each other well. Despite this fact, buyers and sellers do not rely exclusively on word of mouth for the transmission of information about noncooperative behavior. Some information also comes through the arbitration panel, which serves to reveal those that do not comply with its rulings. The arbitration board also responds to misinformation. As Professor Richman found, the board can “punish any party responsible for spreading inaccurate information about another’s reputation.”⁶¹ Here, the imposition of the informal sanctions is triggered by the formal sanction.

As a final piece of evidence, we turn to the contents of many contracts. Best-effort clauses and similar fault-based clauses are common to contracts involving buyers and sellers, particularly those anticipating a long-term relationship. For example, in exclusive-dealing arrangements, the UCC imputes a duty of best efforts for the buyer and the seller.⁶² In a percentage lease agreement, a landowner leases his property in return for a fraction of the gross receipts the lessee obtains from use of the land. Absent a contractual provision to the contrary, courts infer a requirement that the lessee use best efforts to generate gross receipts.⁶³ In franchise contracts, the franchisor often requires that the franchisee promise to use his best efforts to make the venture succeed.⁶⁴ At the same time, franchise contracts allow the franchisor (and franchisee) to terminate (or not renew) the contract. Finally, in mergers and acquisitions contexts, where the parties expect some delay until closing, the agreements will typically require the respective parties to put in best efforts, or commercially rea-

⁶⁰ One might also explain the results in both these studies with an adverse selection story. Litigation reveals that the firm is a bad type, one prone to litigation (“litigious” type). Future partners learn as much and, as a result, become unwilling to deal with a firm involved in prior litigation. The data are also consistent with the moral hazard model we set forth. In the real world, we suspect, both adverse selection and moral hazard are in play.

⁶¹ Richman, *supra* note 1, at 401.

⁶² See U.C.C. § 2-306(2) (2014).

⁶³ *Seggebruch v. Stosor*, 33 N.E.2d 159, 161 (Ill. App. Ct. 1941).

⁶⁴ See Choi & Triantis, *Completing Contracts*, *supra* note 49, at 505 (allowing the principal to use a best efforts clause in addition to the monetary incentive contract can improve welfare); Robert E. Scott & George Triantis, *Anticipating Litigation in Contract Design*, 115 *Yale L.J.* 814, 853 (2006) (noting that franchise and distributorship “contracts typically provide that the agent both satisfy specific requirements and generally exercise best efforts”).

sonable efforts, in abiding by various covenants, such as preserving good relations with suppliers, employees, and customers, and securing shareholder and regulatory approval.⁶⁵

While the exact meaning of “best efforts” may be impossible to pin down, one recent court made a valiant attempt:

To be enforceable, a best efforts contract must set some kind of goal or guideline against which best efforts may be measured. The [prior] court concluded that when sufficient guidelines exist, a party that performs within the guidelines fulfills the contract regardless of the quality of its efforts. Only when a party misses the guidelines would a court measure the quality of its efforts by the circumstances of the case . . . and by comparing the party’s performance with that of an average, prudent, comparable operator.⁶⁶

Occasionally, even in the absence of an express obligation, courts read such “reasonableness” obligations into the interpretation of the contract.⁶⁷ The analysis above suggests why these standard-like terms are so common. They allow—indeed encourage—the court to consider multiple noisy but informative signals to determine breach, facilitating more accurate legal and relational sanctions.

D. Implications for Interpretation of “Good Faith”

This Section will move from the positive (explaining why contracting parties might use both formal and informal sanctions) to the normative, asking what our analysis implies for courts conducting a good-faith analysis. Good faith is a mandatory term implied in all contracts. The Restatement (Second) of Contracts articulates that “[e]very contract imposes upon each party a duty of good faith and fair dealing in its performance and its enforcement.”⁶⁸ The UCC defines good faith as “honesty in fact and the observance of reasonable commercial standards of fair

⁶⁵ See, e.g., Am. Bar Ass’n, Model Merger Agreement for the Acquisition of a Public Company 124 (2011); see also Choi & Triantis, Strategic Vagueness, *supra* note 49 (analyzing mergers and acquisitions contracts using vague “material adverse change” provisions).

⁶⁶ *DaimlerChrysler Motors Co. v. Manuel*, 362 S.W.3d 160, 171 (Tex. App. 2012) (citations omitted) (internal quotation marks omitted).

⁶⁷ E. Allan Farnsworth, *Contracts* § 7.17 (4th ed. 2004).

⁶⁸ See Restatement (Second) of Contracts § 205 (1981).

dealing,”⁶⁹ and states that “[e]very contract or duty within [the UCC] imposes an obligation of good faith in its performance and enforcement.”⁷⁰ The Code goes further to impose a good faith requirement in more specific contexts, for instance, with respect to determining quantity in an output or requirements contract or price in an open-price contract.⁷¹

Although the good faith requirement has been subject to much litigation, courts and scholars have struggled to come up with a workable definition. Legal scholars have advanced three main definitions of “good faith.” First, Professor Robert Summers argued that good-faith performance should be defined in the negative, as an excluder.⁷² Summers conjectured that it would be impossible for a court to identify good faith, or even develop a sensible test for it.⁷³ Instead, Summers urged courts to search for actions amounting to bad faith—in his view an easier task. Surveying the case law, Summers provided a nonexhaustive list of bad-faith actions. Some of those include: (1) evading the spirit of the transaction, (2) entering into a contract without an intent to perform,⁷⁴ (3) willfully rendering only substantial performance,⁷⁵ (4) taking advantage of the other party’s weakness to get a favorable readjustment or settlement,⁷⁶ and (5) adopting overreaching or “weasel[y]” constructions of contractual language.⁷⁷ Summers’s approach has been influential and many courts have followed his lead, as did the drafters of the Restatement (Second) of Contracts.⁷⁸

⁶⁹ U.C.C. § 1-201(20) (2014). By definition, a good faith requirement incorporates the notion of “commercial reasonableness.” Hence, the mandatory requirement of “good faith” has a substantial overlap with parties adopting the standard of “commercial reasonableness.”

⁷⁰ Id. § 1-304.

⁷¹ Id. §§ 2-305 to -306.

⁷² Robert S. Summers, “Good Faith” in General Contract Law and the Sales Provisions of the Uniform Commercial Code, 54 Va. L. Rev. 195, 196 (1968).

⁷³ Id. at 196 (noting that good faith “has no general meaning or meanings of its own, but [instead] serves to exclude many heterogeneous forms of bad faith”).

⁷⁴ Id. at 216.

⁷⁵ Id.

⁷⁶ Id. at 246–48.

⁷⁷ Id. at 244–46.

⁷⁸ Alan D. Miller & Ronen Perry, Good Faith Performance, 98 Iowa L. Rev. 689, 701 (2013) (“[E]xcluder theory has been tremendous. For starters, it has been adopted and applied in numerous decisions throughout the country.”); Allan E. Farnsworth, The Concept of Good Faith in American Law, Address at the Centro di Studi e Ricerche di Diritto Comparato e Straniero (Apr. 1993), available at <http://www.cisg.law.pace.edu/cisg/biblio/farnsworth3.html> (stating that the definition of exclusion “has not only found favor with a number of courts but is reflected in the comments to the Restatement Second’s section on the duty of good faith performance”).

Professor Steven Burton made the next attempt to define “good faith.”⁷⁹ Under his definition, a party acts in bad faith “when discretion is used to recapture opportunities forgone upon contracting—when the discretion-exercising party refuses to pay the expected cost of performance.”⁸⁰ Burton’s idea is this: Take a contract with some discretion on one side of the contract, like, say, a requirements or output contract.⁸¹ At the time of the contract, the parties expect the party holding discretion to give up certain opportunities, like the ability to open a competing business in the same town, or the ability to shut down the business immediately and pursue a more lucrative line of work. If the party uses the discretion offered to reclaim opportunities she gave up under the contract, she acts in bad faith.

Finally, Judge Easterbrook, like Professors Summers and Burton, defines “good faith” by what it is not: bad faith. He equates bad faith with opportunism and states that opportunism refers to two situations:

First, [an] effort to wring some advantage from the fact that the party who performs first sinks costs, which the other party may hold hostage by demanding greater compensation in exchange for its own performance. . . . Second . . . an effort to take advantage of one’s contracting partner in a way that could not have been contemplated at the time of drafting, and which therefore was not resolved explicitly by the parties.⁸²

Despite the inherent difficulty of coming up with a precise definition of “good faith” in a relational contract setting, a judge’s or arbitrator’s determination of “good faith,” like the determination of “best efforts,” can play a useful informational role. As the case of *Silicon Power Corp. v. GE Zenith Controls, Inc.* makes clear, contracting parties can be made better off if the judge considers any noisy signals that are correlated with behavior or effort. The information improves the performance of the

⁷⁹ Steven Burton, *Breach of Contract and the Common Law Duty to Perform in Good Faith*, 94 Harv. L. Rev. 369 (1980).

⁸⁰ *Id.* at 373.

⁸¹ Requirements and output contracts are flexible quantity contracts. A requirements contract measures the quantity by the amount the buyer requires. An output contract measures the quantity by the amount the seller produces. They are governed by § 2-306 of the U.C.C. See generally Robert E. Scott & Jody S. Kraus, *Contract Law and Theory* 316–17 (5th ed. 2013) (providing an overview of the economics of these contracts).

⁸² *Indus. Representatives v. CP Clare Corp.*, 74 F.3d 128, 129–30 (7th Cir. 1996) (internal quotation marks omitted).

formal sanction and any informal sanction that follows. The court might ask: Does the evidence suggest that the low quality resulted from some action by one of the parties—which may or may not constitute bad faith—or instead from unfortunate events? The focus is not necessarily on the party's intent or what the concept of "good faith" really means. If future contracting parties, for instance, observe the arbitrator's finding that the disappointing sales of Silicon Power's low-voltage switch had little to do with GE Zenith's conduct, they will become more willing to enter into relationships with GE Zenith in the future. The arbitrator's finding—by making an explicit finding about best efforts—can prevent the litigation from causing harm to GE Zenith's reputation as a solid business partner.

Consider next the case of *Miller v. Othello Packers*,⁸³ analyzed in the article by Professor Burton. In that case, a seller agreed to sell beans to a buyer who would then plant and harvest the beans. The price was to be determined by a formula based, in part, on the value of the harvested crop. The buyer conceded that "its harvesting procedures were so inefficient that it left three truckloads of bean vines in the grower's field."⁸⁴ Citing the good faith doctrine, the appellate court affirmed the trial court's decision to award the seller a reasonable value of its crop.⁸⁵ Here, the evidence signal is the rotting beans. Leaving the truckload of rotting beans in the field correlates with whether the buyer put effort into maintaining the harvest. Given sufficient effort by the buyer, the beans would probably not have been left in the field. As a result, the court properly considered this evidence in finding a lack of good faith.

As another example, suppose a buyer in a requirements contract closes down a plant or goes out of business (and thus does not require anything under the contract).⁸⁶ Under UCC § 2-306, a requirements contract measures the quantity as the actual requirement "as may occur in good faith."⁸⁷ In applying this statute, our test suggests that the court should focus on what drove the buyer out of business. Did the buyer make a series of bad business decisions? If so, the evidence—going out of busi-

⁸³ *Miller v. Othello Packers*, 410 P.2d 33 (Wash. 1966).

⁸⁴ *Id.* at 34.

⁸⁵ *Id.*

⁸⁶ See *Metal One Am. v. Ctr. Mfg.*, No. 1:04-cv-431, 2005 WL 1657128, at *2-3 (W.D. Mich. July 14, 2005) (noting that the buyer closed down a plant and thus had little demand on the requirements contract).

⁸⁷ U.C.C. § 2-306(1) (2014).

ness—tracks effort and should be part of the good faith analysis. On the other hand, suppose that another dominant producer entered the market, making continued operation unprofitable. Here the same evidence—going out of business—is uninformative about effort and should be excluded from the good faith analysis.

Indeed, one could view the obligation of good faith as an implicit charge to the court to look for noisy but informative signals of the parties' conduct. The parties delegate to the court the choice about which signals (or which extrinsic or other relevant evidence) to consider. Contracting parties might wish to delegate because, at the time of the drafting, they do not know what signals will be available or their relative strength. That said, any delegation creates additional litigation costs, as courts feel compelled to look at multiple signals before finding breach. Fearing the litigation cost but wishing to preserve the benefit of partial delegation, parties might attempt to demarcate what signals are out of bounds and cannot be used to interpret "best efforts" or "good faith." The practice of listing several explicit clauses alongside a vague clause—a practice common in lending agreements and franchise contracts—accomplishes this feat.⁸⁸

To sum up, even if the court is unable to come up with a precise definition of "good faith," by generating evidence of underlying behavior that the counterparty or other market participants can use, litigation over the meaning of good faith can foster the imposition of more efficient reputational sanctions; that is, the imposition of reputational sanctions when it was more likely that the contracting party took actions to benefit himself at the expense of his counterparty.

III. NUMERICAL EXAMPLE OF THE BENEFITS OF INCORPORATING FORMAL SANCTIONS

Having presented the main arguments in nontechnical language with empirical support, this Part formalizes those arguments with the help of a repeated game model. While the main results are the same as in the last Part, using repeated game theory allows us to more accurately present the main thesis and to be more precise about the tradeoffs. We analyze the long-term relationship between two parties, a buyer and a seller. We first present the basic setup of the repeated game and then specify some benchmark results of how the parties can solve the commitment

⁸⁸ See Scott & Triantis, *supra* note 64, at 852–55.

problem when the type of sanction—formal or relational—is costless. We next show the optimal deterrence regime when both types of sanctions are costly, concluding with the basic intuition on why incorporating legal sanctions in a long-term relationship is useful. We end the Part with the variation of the model that emphasizes the informational role played by formal sanctions, in particular through vague, open-ended standards, such as “best efforts” and “good faith.”

A. The Basic Setup

Imagine a buyer and a seller engaged in a long-term, repeated relationship.⁸⁹ They can transact in periods 1, 2, 3, and so on. In any period, the relationship can terminate with some positive probability (due, for instance, to an unforeseen dissolution or liquidation of one of the parties). In addition, the parties value present dollars more than future dollars. We assume the parties discount future earnings by a factor of 0.9. This means, for instance, that \$100 in period 3 is worth $(0.9) \times \$100$, or \$90, in period 2, or worth $(0.9) \times (0.9) \times \100 , or \$81, in period 1. Each period is comprised of several stages. They are: (1) The buyer initially approaches the seller about purchasing a good; (2) the seller makes an offer to the buyer; (3) when the buyer accepts and pays the price, the seller undertakes unobservable effort; (4) the good is delivered and the quality is realized and observed; and (5) the buyer can bring a suit

⁸⁹ The buyers and sellers could be any two commercial parties interacting repeatedly, for instance, a vendor and a distributor, a movie studio and a talent agency, or a building company and a supplier of raw materials. There are (at least) two ways of thinking about the long-term relationship. The parties could be interacting in a spot transaction in each period, with the (implicit) understanding that they will continue their relationship in the future. Alternatively, they could have signed a long-term requirements contract (that is renewable), which gives the buyer the discretion of ordering nothing from the seller.

Given that we are assuming a long-term interaction between two players, in theory it is possible for them to implement the first-best relational contract that relies, in part, on the seller's promise to pay sufficiently large damages (or warranty) when the realized quality of the product is low, backed by relational sanctions against nonpayment. With this arrangement, the parties may be able to eliminate costly litigation altogether. The first-best relational contract will not be feasible, however, when (1) the court can make an error in determining the realized quality (which will, in turn, raise the possibility of frivolous litigation); or (2) the seller has to transact with a new buyer in each period and buyers do not observe certain aspects of the past transactions. For the sake of simplicity, we shy away from both of these complexities. For a detailed analysis of these issues, see Scott Baker & Albert Choi, *Promoting Long-Term Relationships Through Costly Litigation* (Nov. 14, 2014) (unpublished manuscript, available at <http://ssrn.com/abstract=2195749>).

against the seller. Let us fill out the contours of this sequence in more detail.

At the beginning of each period, the buyer decides whether to approach the seller and inquire about purchasing a single unit of a good (product or service). In response to the buyer's inquiry, to keep the analysis simple, assume that the seller makes the buyer a take-it-or-leave-it offer. The buyer accepts or rejects.⁹⁰ The seller's offer contains three elements: a description of the good (q), a price (p), and a liquidated damages (or warranty) term (d). As described in more detail shortly, the liquidated damages term is what the seller promises to pay in the event the product turns out to be "low" quality (or when the good does not meet the specifications or fails to function as requested). If the buyer rejects the offer, both parties get a payoff of zero for that period.⁹¹

If the buyer accepts, the buyer pays the price, and the seller can exert costly effort in the production of the good that affects the quality of the delivered good (or affects the probability that the good will be "conforming"). She might, for example, decide how much time to spend ensuring that the good produced for the order meets the buyer's specifications. To keep things simple, assume the seller can decide to exert either high or low effort. The effort translates into the delivery of a high- or low-quality good. The seller's effort is unobservable to the buyer and to any third party. Low effort—"defection" in the language of the prisoner's dilemma—costs the seller \$10. At the same time, even with low effort, there is a twenty-five percent (25%) chance that the seller will get lucky and produce high quality in spite of his shirking behavior. On the other hand, high effort or "cooperation" costs the seller \$40. High effort is more effective than low effort at generating high quality. But high effort doesn't perfectly translate into high quality. Specifically, assume that high effort carries a seventy-five percent (75%) chance of producing high quality.

⁹⁰ Allowing the seller to make a take-it-or-leave-it offer to the buyer makes the seller the residual claimant of the transaction. There are two advantages of using this approach. First, this convenient assumption allows us to compare the efficiency of different sanctioning regimes by simply looking at the seller's long-run profit. Second, if the parties were to split the surplus, relational sanctions become even less effective in terms of the cost-benefit ratio because the buyer will have to impose longer relational sanctions to achieve the desired level of deterrence, which imposes a larger deadweight loss.

⁹¹ Outside reservation values are normalized to zero for convenience. Zero represents the value of the parties' next best alternative.

The buyer values high-quality goods more than low-quality goods. Assume that the buyer values high quality at \$100 and low quality at \$0. Given these numbers, it is efficient for the seller to choose high, rather than low, effort. With high effort, the expected surplus from the transaction is \$35, or $(0.75) \times \$100 + (0.25) \times \$0 - \$40$. By contrast, with low effort, the expected surplus from the transaction is equal to \$15, or $(0.25) \times \$100 + (0.75) \times \$0 - \$10$.⁹² The following table summarizes the basic parameters of the relationship.

Table I: Transactional Parameters

	Probability of High Quality (Conforming)	Expected Value of the Good	Cost of Effort	Net Surplus
High Effort (Cooperate)	75%	\$75	\$40	\$35
Low Effort (Defect)	25%	\$25	\$10	\$15

After the seller exerts effort, the good is produced and delivered, and both parties observe the quality realized. Even though it is efficient for the seller to cooperate and put in high effort, without any sanctions (legal or relational), such an outcome is not obtainable.⁹³ The reason stems

⁹² Even when the seller chooses low effort, the expected surplus is still positive. We could assume instead that, with low effort, the expected surplus is negative. This will be true, for instance, if the probability of obtaining high quality with low effort is less than 0.1. In that case, without a successful deterrence mechanism, the parties will never trade, and the market will fall apart.

⁹³ This is a classic example of one-sided moral hazard, most often used in principal-agent models. By assumption, the seller is the only party that chooses an unobservable input. We use a one-sided moral hazard example to demonstrate the main ideas without too much complication. In many commercial settings, of course, one would expect both parties to engage in behavior (some of which may be unobservable) that affects the value of the relationship. That type of relationship can be represented by two-sided moral hazard, prisoner's-dilemma-type models. We believe the results can be easily extended to such settings.

We also do not allow the seller to be of different "types" so as to shy away from the issues of adverse selection. When different seller types have different costs of effort, some may have an incentive to mimic others, and that pooling can lead to inefficiency. When the buyer's learning is "unbounded," that is, the buyer has knowledge of outcomes from all past transactions, however, we suspect that the seller types will eventually be separated, and the adverse selection issue will disappear, leaving only the per-period moral hazard concerns described in the text.

from the fact that the seller's effort choice is not observable and cannot be contracted upon. Conditional on any price, because high effort costs the seller more than low effort she has no incentive to choose high effort. Suppose the buyer pays \$75 for the product, having faith that the seller will put in high effort. If the seller were to put in high effort—at a cost of \$40—she reaps a profit of $\$75 - \40 , or \$35. Low effort, by contrast, costs the seller only \$10 and leads to a profit of $\$75 - \10 , or \$65. In a very simple way, these numbers reveal the presence of a moral hazard (or commitment) problem. Since the buyer's payment is independent of the seller's effort, and effort is costly, the seller avoids high effort.⁹⁴

The buyer, of course, understands the seller's incentives and adjusts her expectations accordingly. When the seller exerts low effort, the expected value of the good is \$25, or $(0.25) \times \$100 + (0.75) \times \0 , which represents the maximum the buyer will be willing to pay for the contract. In equilibrium, given her power to make a take-it-or-leave-it offer to the buyer, the seller will offer slightly less than \$25 for the contract; the buyer will accept the offer and expect that the seller will put in low effort. This expectation will then be confirmed as the seller chooses low effort. The end result is low prices and low seller effort. Due to the problem of moral hazard, even though it is efficient for the seller to put in high effort, without any formal or informal sanctions, the buyer and seller cannot achieve this outcome. So they end up realizing a much lower surplus from their relationship. The following table presents the parties' strategies and outcomes.

Table II: Stage-Game Payoffs

	High Effort (Cooperate)	Low Effort (Defect)
Not Purchase (Reject)	(\$0, \$0)	(\$0, \$0)
Purchase (Accept)	(\$75- p , p -\$40)	(\$25- p , p -\$10)

⁹⁴ Our seller acts like a fully insured individual in the classic discussions of moral hazard. Fully insured individuals shirk. See Steven Shavell, *On Moral Hazard and Insurance*, 93 Q. J. Econ. 541, 541 (1979) (articulating a model of insurance and moral hazard). The critical element here is the inobservability and nonverifiability of the seller's effort. Timing of the payment is less important. Even if the buyer were to pay the price at the same time as the seller is choosing effort, the same result will hold.

The left-most column represents the buyer's choices, her strategies. She can either accept or reject the seller's offer. The top row represents the seller's possible actions, her strategies. She can put in high or low effort. If the buyer rejects the offer, both parties get a payoff of \$0, which is represented in the first row of the table. The efficient outcome is for the buyer to purchase and the seller to put in high effort (Purchase, High Effort). Such a combination generates respective profits of $\$75-p$ for the buyer and $p-\$40$ for the seller. That is, assuming the buyer's purchasing of the product, the seller's payoff from low effort ($p-\$10$) is always larger than the payoff from high effort ($p-\$40$). In game theory terms, low effort is the seller's (weakly) dominant strategy.⁹⁵ Hence, the buyer and seller end up in the inefficient cell corresponding to (Purchase, Low Effort). The respective profits are $\$25-p$ and $p-\$10$.

B. When Enforcement Is Costless

Now consider the two primary methods of solving this moral hazard problem: legal and relational sanctions. The legal sanction takes the form of payment of liquidated damages in the example. The relational sanction involves a suspension or termination of relationship.⁹⁶ Either will be triggered when the buyer observes an undesirable outcome, such as low-quality product or the seller shirking (that is, putting in low effort). Both will motivate the seller to choose high effort. Not surprisingly, when legal and relational sanctions are costless to impose (or perfectly accurate), the parties can achieve the first best outcome: high effort and high prices, with the maximum possible surplus from the transaction.

To see why, first consider legal sanctions. Suppose that the buyer can bring a lawsuit against the seller to collect liquidated damages (d) when the realized quality is low. As a benchmark, assume that litigation is

⁹⁵ The parenthetical "weakly" is there because the seller is indifferent between the two levels of effort when the buyer does not purchase from her; that is, she only weakly prefers low effort conditional on no purchase. In the prisoner's dilemma setting, numbers are set up such that "defection" is a strictly dominant strategy for each player.

⁹⁶ Legal sanctions, in the form of damages, can be thought of as a "stick" mechanism against misbehavior, while reputational sanctions, by allowing the seller to preserve the long-term relationship, can be thought of as a "carrot" mechanism. So the main issue can be recast as a problem of whether the parties should utilize more of the stick or the carrot mechanisms.

costless. Without any litigation cost, by promising sufficiently high damages, the parties can easily achieve the first best. For example, suppose the seller promises to pay damages (d) of \$100 if she delivers low quality.⁹⁷ After collecting the price (p) from the buyer, the seller's effort choice affects the damages she expects to pay. And that makes a difference as compared to the case of no sanctions, discussed above. With damages of \$100, if the seller were to put in high effort, her expected profit would be $p - (0.25) \times \$100 - \$40 = p - \$65$. The second term, $(0.25) \times \$100$, reflects the fact that, even with high effort, there is a 25% chance the seller will deliver low quality, upon which the buyer sues and collects \$100 in damages. If, instead, the seller were to choose low effort, her expected profit would be $p - (0.75) \times \$100 - \$10 = p - \$85$. Compared to high effort, the middle term in the low-effort expression has gone up: The probability of having to pay \$100 of damages is now 75% instead of 25%. The last term, by contrast, falls from \$40 to \$10 to reflect the lower cost of effort.

Since $p - \$65 > p - \85 , the \$100 liquidated damages award motivates the seller to exert high effort.⁹⁸ With high effort, the seller faces a lower expected-damages award, but a higher cost of effort. Given that litigation is costless and the court can perfectly verify the realized quality, the seller can set the damage award as high as needed to ensure the cost savings from a lower expected award more than offset her higher cost of effort.⁹⁹ More important, because litigation is costless, the seller's commitment to pay high damages solves the incentive problem without entailing any loss in transactional surplus whatsoever.¹⁰⁰

⁹⁷ Throughout the analysis, we assume that the court accurately determines whether the product is low quality. Thus, the buyer cannot falsely claim a high-quality good is low quality and recover under the liquidated damage provision. This assumption takes nuisance or frivolous lawsuits off the table.

⁹⁸ Indeed, any damage award larger than \$60 will solve the problem. For the seller to put in high effort, we need $p - (0.25) \times d - \$40 \geq p - (0.75) \times d - \10 . When we solve for d , we get $d \geq \$60$.

⁹⁹ We are assuming away the antipenalty doctrine in contract law that limits the amount of liquidated damages that the parties can post. When such limitations exist, the parties' ability in providing necessary deterrence may be limited. We are also assuming away that the parties, the seller in particular, are judgment-proof. With a judgment-proof seller, the damages may not be bigger than the price the buyer pays the seller.

¹⁰⁰ This is an example of the court costlessly verifying the realized quality. Using price and damages is tantamount to setting up an incentive pay system. We have implicitly assumed that both parties are risk-neutral and neither is judgment-proof. If one or both of the assumptions do not hold, even with perfect verification by the court, because quality realization only imperfectly translates to seller's effort, imposing an incentive system can generate some

Next consider the relational sanctions. Suppose, as a departure from the initial assumptions, that the buyer actually observes the seller's effort. Let us think about the harshest possible relational sanctions: Whenever the buyer observes low effort by the seller, the buyer never purchases from the seller again (using the "grim trigger" punishment strategy in game theory parlance). Compared to the legal sanctions case, the analysis is slightly more involved but still straightforward. If the seller puts in high effort each period, the seller will make a profit of $p - \$40$ in each period. With the discount factor of 0.9, the discounted value of the stream of payoffs equals $(p - \$40) / (0.1)$.¹⁰¹ If the seller deviates and puts in low effort, on the other hand, she obtains the one-time cost savings associated with shirking. But that savings comes with a price tag. The seller will never be able to sell to the buyer again. The seller's payoff to low effort is thus $p - \$10$.

Remember that the buyer is willing to pay up to \$75 for the good when the seller exerts high effort (that, after all, is the buyer's expected benefit from having the good produced with such effort). In our story, the seller makes a take-it-or-leave-it offer to the buyer. Knowing that the buyer values the good at \$75, the seller will set the price at that value, offering $p = \$75$. In light of securing this price, the seller's long-run, discounted profit from exerting high effort (every period) is $(\$75 - \$40) / (0.1) = \$350$. By contrast, if the seller deviates (once), she makes $\$75 - \$10 = \$65$. The relational loss (that is, the loss of all future sales) is clearly larger than the seller's one-time gain from deviation.¹⁰² As a result, the threat of this loss provides sufficient incentive for the seller to put in high effort. More important, the parties can fully capture the maximum possible surplus from trade. This happens for two reasons: (1) The buyer observes the seller's effort choice; and (2) in equilibrium, the seller always selects high effort, and, as a result, the buyer never car-

deadweight loss, either in the form of imposing risk onto a risk-averse party or leaving some surplus to a judgment-proof party.

¹⁰¹ The seller-discounted stream of payoffs is $(p - \$40) \times (1 + 0.9 + 0.9^2 + 0.9^3 + \dots)$. The infinite sum in the second set of parentheses reduces to $1 / 0.1$.

¹⁰² The grim-trigger punishment strategy is clearly an overkill here. In fact, the buyer needs to suspend the relationship for only about 1 period after observing low effort by the seller to induce the seller to cooperate. The number 1 can be found as follows. Under cooperation, with $p = \$75$, the seller's long-run discount profit is \$350, or $(\$75 - \$40) / (0.1)$. Suppose that, if the seller deviates, the buyer suspends trade for T periods. If the seller deviates, the seller's long-run discount profit becomes $\$75 - \$10 + (0.9)^{T+1} \times \350 . When we set this expression equal to \$350 and solve for T , we get about 0.95.

ries out the relational sanctions, regardless of the realized quality. When effort is observable, then, relational sanctions like formal sanctions also achieve the first best.

Before we proceed, let us make one important note about using boycott (suspension or termination) as a relational sanction. Given that the expected surplus from the transaction is still positive (at \$15) even with low effort by the seller, a more “efficient” relational punishment is for the seller to choose low effort and offer \$15 to the buyer, and for the buyer to accept in each punishment period. That punishment strategy can be sustained by shifting the buyer’s beliefs: Once the buyer observes low quality, the buyer now believes (during the punishment period) that the seller will put in low effort for any price larger than \$15. In the punishment stage, a stage-game Nash equilibrium of (Purchase, Low Effort) is obtained. In terms of inducing the seller to cooperate, both types of punishment (boycott or trade with lower price) are equivalent in the sense that they require the same amount of deadweight loss in achieving the desired level of deterrence. The difference, however, is more aesthetic: In the boycott punishment, the parties do not trade, whereas in the drop-in-price punishment, parties still trade but with suboptimal quality.¹⁰³ For this reason, we will use boycott (suspension or termination of trade) as the punishment strategy.

¹⁰³ Note that both types of punishment strategies are inefficient. Any relational sanctions that entail inefficiency (including suspension or termination of trade) will be subject to the problem of renegotiation. That is, when the buyer is supposed to “impose” punishment (either through suspension/termination or shifting her beliefs about the seller’s effort choice), given that there is a positive surplus from trade when the seller puts in high effort, the players have an incentive to “renegotiate” out of the punishment phase. Such renegotiation will, of course, undermine the punishment strategy.

Furthermore, for both types of punishment strategies, relational sanctions will also be subject to the problems of subgame perfection. When the punishment, based on the Nash Equilibrium or suspension of the relationship, is to start, the seller may be able to unilaterally evade punishment by promising high enough damages (a generous warranty, perhaps). When damages are sufficiently high, the buyer should (correctly) believe that the commitment problem is being solved and should be willing to purchase from the seller at a high price. To the extent that such high damages still provide some profit to the seller, it will be in the seller’s interest to bypass reputational punishment (which gives her zero profit) through damages. Given that higher damages are likely to lead to more litigation (and more deadweight loss), this constitutes yet another type of punishment against the seller.

The “renegotiation-proofness” and the subgame perfection issues can be addressed as follows. To impose an efficient punishment (where the parties trade and the seller puts in high effort in the punishment stage), the parties should not rely on any legal sanctions, since they produce deadweight loss through the cost of litigation. Also, the players should make sure that, even in the punishment stage, the seller will have an incentive to exert high effort (co-

C. When Enforcement Is Costly

In reality, litigation is costly and players rarely observe each other's behavior perfectly. With respect to observability, let us return to the initial assumption that the buyer does not observe the seller's effort choice and only observes the realized quality. With respect to the litigation, let us assume that, to bring a lawsuit, the buyer must incur a litigation cost. Suppose the litigation cost is uncertain *ex ante* and gets realized after the quality of the good has been determined. Like effort and quality, litigation cost can be either high or low, but with equal probability (50% chance for each). If the cost is high, the buyer must pay \$80 to go to court. If the cost is low, she must pay \$30. Although litigation is costly for the buyer, for the sake of simplicity, we assume that the seller does not incur any litigation cost and, as before, the court does not make any mistake in verifying the realized quality.¹⁰⁴ Finally, let us assume that

operate). The efficient (renegotiation-proof and subgame perfect) punishment strategy will involve: (1) the seller posting a high price during the cooperation stage; (2) in the punishment stage, the buyer still purchases but at a lower price; (3) while in the punishment stage, when high quality is realized, the players revert back (the seller gets "rehabilitated") to the cooperation phase (with high price) with some positive probability; and (4) the low price in the punishment phase is high enough to guarantee the seller the profit she would have gotten had she posted high enough damages to solve the commitment problem using only legal sanctions. The third factor, positive probability of reversion back to the cooperation phase, is there to ensure the seller will have an incentive to exert high effort even in the punishment phase.

While theoretically attractive, this efficient punishment strategy has two important limitations. First, because the players have to allow the seller to revert back to the cooperation phase from the punishment phase, this will impose a limit on how strong the relational punishment can be. A strong punishment, such as the grim-trigger punishment strategy, will simply not be possible since, once in the punishment phase, the seller will not have any incentive to exert high effort. Second, punishment is also limited because the seller has to make some positive profit even during punishment. Otherwise, the seller will bypass the punishment stage by offering high damages. These limitations imply that, for the efficient punishment strategy to work, the players have to be very patient—they must have a large discount factor. See Baker & Choi, *supra* note 89, for a more detailed analysis of these issues.

¹⁰⁴ The assumptions that the seller does not bear any litigation cost and the court does not make any mistake on verifying realized quality are done for simplification. With respect to the former, in addition to reducing the total surplus from trade, litigation cost on the seller will have the effect of producing additional deterrence. This is because the seller is more likely to face litigation and incur litigation cost when she deviates. Litigation cost on the seller, therefore, will make reliance on legal sanctions more attractive. Second, no court error but positive litigation cost is an example of costly but perfect verification. Unlike before, now the parties need to incur verification cost to receive a court judgment. If the court can make an error in its quality determination, it can lead the buyer to file suit (a "frivolous" suit)

the buyer can also impose relational sanctions against the seller by suspending or terminating the relationship, following the outcome in each period.

Not surprisingly, once we take away costless litigation and perfect observability, efficiency can no longer be achieved. To provide incentives with formal sanctions, the buyer will have to incur litigation cost, which reduces the surplus from trade. With relational sanctions, because suspension (or termination) of the relationship is conditioned on observables—such as realized quality—rather than the seller's effort, a danger exists that the buyer will impose relational sanctions even when the seller has, in fact, put in high effort. Moreover, if the buyer suspends the relationship after receiving low quality, the parties will be unable to reap any surplus from trade while they are in the punishment phase. In devising the optimal sanctioning mechanism, therefore, the parties will have to balance the cost of litigation against the cost of misfiring relational sanctions.

1. Legal Sanctions Only

What is the optimal mix of sanctions when neither sanction is costless to impose? Let us first consider two polar cases. First, suppose the parties deploy only the legal sanctions. For the parties to solve the commitment problem, damages have to be at least \$80. To see why, consider a two-step analysis. First, notice that if the damages are set below \$30, given the possible litigation costs of \$30 or \$80, the buyer will never sue the seller when she observes low quality and the seller will have no incentive to exert high effort. Second, if the damages are set between \$30 and \$80, the seller will still have insufficient incentive for effort. Suppose that the seller selects high effort. Her expected profit is $p - (0.25) \times (0.5) \times d - \40 . With damages set between \$30 and \$80, if the buyer draws a high cost of litigation (\$80) she does not sue the seller even when the seller delivers low quality. If the seller deviates to low effort, her expected profit is $p - (0.75) \times (0.5) \times d - \10 . With low effort, damages are paid with probability $(0.5) \times (0.75)$. For the seller to have the incentive for high effort, we need $p - (0.25) \times (0.5) \times d - \40 to be

against the seller even when the realized quality is high, particularly when damages are sufficiently large. Allowing for such possibilities will make reliance on legal sanctions less desirable, but, we suspect, will not change the main conclusions of the example. For a more general treatment of verification cost, see Choi & Triantis, *Completing Contracts*, supra note 49. For more on allowing frivolous litigation, see Baker & Choi, supra note 89.

larger than $p - (0.75) \times (0.5) \times d - \10 . But that requires damages to be at least \$120, a contradiction since we have confined the damages to between \$30 and \$80.

To solve the incentive problem with only legal sanctions, therefore, the damages have to be larger than \$80. Suppose the seller sets the damages at \$81, large enough to cover the litigation cost of any buyer. Now, the buyer will sue the seller to collect damages whenever the realized quality is low. The damage award will cover the buyer's cost of litigation whether it is high or low. As a result, there is 100% chance of litigation in the case of low quality. The seller's expected profit, if she exerts high effort, is therefore $p - (0.25) \times d - \$40$. Comparable profit under low effort is $p - (0.75) \times d - \$10$. In order to provide the necessary incentive, we need $p - (0.25) \times d - \$40$ to be (weakly) larger than $p - (0.75) \times d - \$10$. This is equivalent to setting damages (d) larger than \$60. At $d=\$81$, this condition is satisfied.

Although using only the legal sanctions (with damages set at \$81) solves the incentive problem, the parties incur a substantial amount of litigation cost in equilibrium. Whenever quality is low, the buyer incurs an expected litigation cost of \$55.¹⁰⁵ Given a 25% chance of receiving low quality with high effort, this translates to the expected loss of surplus each period of \$13.75, or $(0.25) \times \$55$. The total surplus from trade, without litigation, was \$35. In short, frequent litigation brings the per-period surplus down to about \$21.25 and drags the long-run, discounted surplus down to about \$212.50.¹⁰⁶ Compared to the first-best long-run surplus of \$350, the parties face a steep reduction in gains from trade by solving the incentive problem with only legal sanctions.

2. Relational Sanctions Only

What if the parties were to rely only on relational sanctions? Imagine that the seller sets the liquidated damages to \$0. Even without any legal sanctions, if the buyer imposes relational sanctions through suspension of trade after receiving low quality, the parties can still solve the incentive problem. Suppose the buyer stops purchasing from the seller for

¹⁰⁵ Half the time, the litigation cost is \$30, and half the time it is \$80. The expected litigation cost is thus $(0.5) \times \$30 + (0.5) \times \$80 = \$55$.

¹⁰⁶ The \$21.25 surplus is realized every period. Its discounted value is thus equal to $\$21.25 \times (1 + .9 + .9^2 + .9^3 \dots)$, which reduces to $\$21.25 / 0.1$, or \$212.50. The first-best surplus in each period is \$35. When realized every period, the long-run discounted first-best surplus is $\$35 / 0.1$, or \$350.

four periods after receiving low quality.¹⁰⁷ After the four-period suspension, the buyer resumes the purchase as before. The analysis is a little involved, but it can be shown that this suspension threat is sufficient to induce the seller to exert high effort.¹⁰⁸ Recall that the buyer is willing to pay up to \$75 for the product when the seller exerts high effort. With her power to make take-it-or-leave-it offers, the seller will offer (slightly below) \$75 to the buyer. With \$40 of effort cost, the seller's profit in each period is (slightly less than) \$35. Conditional on purchase, the seller's per period profit is higher when it relies exclusively on informal sanctions rather than exclusively on formal sanctions. The reason is that, by setting the damages to zero, the seller eliminates the litigation costs.

At the same time—and unlike the case of relying only on legal sanctions—the seller is not guaranteed a purchase from the buyer every period. Instead, even when the seller puts in high effort, she still faces a 25% chance of producing low quality and losing sales for the next four periods. During the suspension period, the seller reaps zero profit. When the buyer employs the four-period relational sanctions upon receiving low quality and when the seller charges \$75 for the product, we can show

¹⁰⁷ Throughout the analysis, we round up or down (as necessary) the numbers, both the dollar figures and the number of punishment periods, for ease of exposition. For instance, if the parties were to rely only on informal sanctions, the exact number for the punishment period would be 3.848.

¹⁰⁸ Let V be the discounted profit in the event the seller produced high quality last period. The seller's long-run profit from high effort can be written recursively as

$$V = (p - \$40) + (0.25) \times \delta^5 V + (0.75) \times \delta V.$$

The " δ^5 " term stands for the fact that the seller suffers a four-period gap with no sales following the realization of a low-quality good. Thus, a positive value of the relationship is not realized again until five periods later. The seller's payoff from low effort is

$$(p - \$10) + (0.25) \times \delta V + (0.75) \times \delta^5 V.$$

The seller prefers high effort if the payoff from high effort exceeds the payoff from low effort: $(0.75 - 0.25) \times \delta \times (1 - \delta^4) V \geq \$40 - \$10$.

Using $V = (p - \$40) + (0.25) \times \delta^5 V + (0.75) \times \delta V$, when we solve for V , we get

$$V = (p - \$40) / \{[1 - (0.75) \times \delta] - (0.25) \times \delta^5\},$$

which is also equal to

$$V = (p - \$40) / [(1 - \delta) + (0.25) \times \delta \times (1 - \delta^4)].$$

Given no formal sanctions, there are no litigation costs. That means that, conditional on high effort, the buyer is willing to pay up to \$75. Plugging this value in for price gives a discounted payoff of

$$V = (\$75 - \$40) / [(1 - \delta) + (0.25) \times \delta \times (1 - \delta^4)].$$

Now, we can check that, under these conditions, the seller indeed wishes to exert high effort. Plugging the value of V into the expression $(0.75 - 0.25) \times \delta \times (1 - \delta^4) V \geq \$40 - \$10$, we get $(0.75 - 0.25) \times \delta \times (1 - \delta^4) \times (\$75 - \$40) / [(1 - \delta) + (0.25) \times \delta \times (1 - \delta^4)] \geq \$40 - \$10$. When $\delta=0.9$, the inequality is strictly satisfied.

that the seller's long-run, discounted profit is \$200, or $\$35 / 0.175$.¹⁰⁹ Compared to the case of using only legal sanctions, the effect of relational sanctions shows up as a bigger discount rate (0.175 versus 0.1). This is intuitive since, with relational sanctions, the parties face a larger chance of temporary termination of their relationship. But, even with only four periods of suspension, because the chances of triggering that relational punishment are sufficiently large (25%), as compared to the first best outcome, the parties face a steep reduction in long-run surplus (\$350 versus \$200).

3. Using Both Legal and Relational Sanctions

What about using both types of sanctions? Notably, the parties can improve their situation by setting moderately large liquidated damages. Doing so discourages the high-litigation-cost buyer from filing suit. Any sanctions shortfall, then, can be made up with a modest dose of relational sanctions. Let us be more precise. Suppose that the seller sets the damages award at \$79. As noted above, the buyer's litigation costs are \$30 or \$80 with equal probability. A liquidated damage award of \$79, therefore, makes suits unattractive for the buyer with the \$80 litigation cost. But some threat of a lawsuit remains. Specifically, the buyer drawing the litigation cost of \$30 will still file suit upon receipt of low quality. As we saw previously, however, when the seller is sued only half the time when quality is low, with \$79 liquidated damages, the seller has insufficient incentive to exert high effort from only formal sanctions.¹¹⁰

To provide sufficient incentive to the seller, therefore, the parties have to supplement the legal sanctions with relational sanctions. Imagine they combine the \$79 penalty with a one-period boycott. Unlike with exclusive reliance on relational sanctions, the boycott need not be four periods

¹⁰⁹ From the previous footnote, the seller's long-run, discounted profit was given by $V = (\$75 - \$40) / [(1 - \delta) + (0.25) \times \delta \times (1 - \delta^4)]$. When we solve for V with $\delta=0.9$, we get $V = \$35 / [(0.1) + (0.25) \times (0.9) \times (1 - (0.9)^4)] \approx \$35 / 0.175$.

¹¹⁰ The seller's payoff from high effort is $p - \$40 - (0.25) \times (0.5) \times \$79 = p - \$49.875$. The first term is the price. The second term is the cost of effort. The third term is the expected damage award. The seller pays this award if two events transpire: (1) the seller delivers a low-quality product; and (2) the consumer draws a low litigation cost and therefore sues. Given high effort, the first event occurs with probability of 0.25. Since the consumer is equally likely to draw high or low litigation costs, the second event arises with probability of 0.5. On the other hand, the seller's payoff from low effort is $p - \$10 - (0.75) \times (0.5) \times \$79 = p - \$39.625$, which is strictly higher. Comparing the two numbers, one can see that the shortfall in deterrence associated with a \$79 damage award is $\$49.875 - 39.625 = \10.25 .

to deter seller misconduct. The reason is that the seller is already being partially deterred by the threat of the legal sanction. The one-period boycott just fills in the deterrence gap. Now, let us think about the seller's long-run, discounted profit with this combination approach. When the seller puts in high effort each period, with a 25% chance of producing low quality and a 50% chance of being sued conditional on low quality (only when litigation cost is \$30), the buyer is willing to pay about \$81.¹¹¹ With the power to make take-it-or-leave-it offers, the seller will set $p = \$81$ and earn about \$31 each period.¹¹² If the seller is also subject to a one-period suspension of the relationship, the seller's long-run, discounted profit becomes about \$253, or $\approx \$31 / 0.1225$.¹¹³

The seller's long-run payoff from combining both types of sanctions is higher than using either sanction on its own. Each sale with the modest damage award carries some risk of litigation. And this risk of litigation is factored into the seller's per-period profit. The litigation exposure is less with the modest award than with the large award since the modest award induces fewer and less costly lawsuits. For this reason, the firm's per-period profit is higher with the modest award than with the large damage award. Meanwhile, the inclusion of any litigation risk means that the firm's per-period profit is lower with the modest damage award than when the parties rely exclusively on informal sanctions. The following table compares the outcomes from three different sanctions regimes and shows that the combination approach provides the largest long-run surplus for the parties.

¹¹¹ The buyer's expected surplus given the seller exerting high effort is \$75. From this, the buyer deducts his expected litigation cost of $(0.25) \times (0.5) \times \30 . At the same time, the buyer adds to his willingness-to-pay his anticipation of the expected damage pay, $(0.25) \times (0.5) \times \79 . Taking these three together produces the buyer's willingness to pay of \$81.125.

¹¹² The seller charges \$81. To get the seller's per-period payoff conditional on a sale, from \$81, we deduct both the effort cost of \$40 and the seller's expected damage payment of $(0.25) \times (0.5) \times \79 . The calculation yields \$31.125.

¹¹³ The analysis is comparable to the case where the players were relying exclusively on informal sanctions, except for the fact that the seller's per-period profit is lower and the discount rate is smaller. The seller's long-run, discounted profit is given by

$$V = \$31 / [(1 - \delta) + (0.25) \times \delta \times (1 - \delta)].$$

When we solve for V with $\delta = 0.9$, we get

$$V = \$31 / [(0.1) + (0.25) \times (0.9) \times (0.1)] = \$31 / 0.1225 \approx \$253.06.$$

Table III: Comparison of Different Incentive Mechanisms

Incentive Mechanism	Long-Run Discounted Surplus
The First Best (No Deadweight Loss)	\$350
Legal Sanctions Only ($d=\$81$)	\$212
Reputational Sanctions Only ($d=\$0$ and 4-period suspension)	\$200
Legal and Reputational Sanctions ($d=\$79$ and 1-period suspension)	\$253

D. Decoupling and Maximizing the Deterrence Bang for the Buck

The fact that the parties would use legal sanctions, and to the maximum extent possible (at \$79, slightly below the high litigation cost of \$80), supports an important advantage that legal sanctions possess over reputational sanctions. The advantage stems from the parties being able to attain a better deterrence benefit-to-cost ratio using legal sanctions. Increasing deterrence through additional relational sanctions will engender the equal amount of deadweight loss in terms of lost future surplus. On the other hand, by being able to control the size of the recovery (for example, liquidated damages) that the winning party claims in dispute resolution, the parties are able to attain a better deterrence benefit-to-cost ratio with legal sanctions: They may be able to achieve a better than one-to-one deterrence benefit-to-cost ratio through legal sanctions. The optimal regime is for the parties to max out on the legal sanctions so long as the ratio is better than one-to-one and make up the remainder, if any, with relational sanctions.

To see this point more concretely, let us briefly analyze how much additional deterrence the parties can get for additional deadweight loss in each scenario. Note, foremost, that by deviating from the intended equilibrium and choosing low effort, the seller is able to gain \$30 (given by the difference in costs) of additional profit in a given period. Hence, to successfully deter the seller from deviating, the parties have to design a system that provides at least \$30 of deterrence. Before we start, though, note that since the gains from deviation are calculated using the difference in profits if the seller puts in high and low effort, to make the right comparison, both the benefit (the size) of deterrence and the cost of

providing that deterrence should also be done based on the difference of expected sanctions and costs, respectively.

First, with respect to the relational sanctions, it is easy to see that providing \$1 additional deterrence requires incurring the equal size in deadweight loss. From the numerical example, the parties expect to realize \$35 of net surplus (buyer's expected benefit minus the seller's high-effort cost) in each period. Since the seller, with the power to make take-it-or-leave-it offers in each period, is the residual claimant, if the seller is denied one period of trade next period, the seller loses \$35 of surplus next period. In terms of the benefit (size) of deterrence, we have to multiply \$35 by both the discount factor of 0.9 and the difference in probability of being imposed such a sanction, 0.5. That is, if the seller were to cooperate, there would a 25% chance of the relational sanction being imposed. If the seller were to deviate, on the other hand, the probability would increase to 75%. The difference between the two is 50%. When we do the calculation, the size of one period of relational sanctions is about \$15.75, or $\$35 \times (0.9) \times (0.5)$. Note that this is exactly equal to the expected loss in surplus when the seller is the residual claimant, which represents the cost of imposing relational sanctions. Hence, relational sanctions impose the deterrence benefit-to-cost ratio of 1.

The story is different with respect to legal sanctions. Recall that the buyer has an equal chance of drawing either \$30 or \$80 of litigation cost. As a thought experiment, suppose we set the damages slightly higher than \$30, so that the seller gets sued by the buyer and pays \$30 of damages with probability one-half when the realized quality is low. In this case, the benefit (size) of deterrence is equal to \$7.50, or $\$30 \times (0.5) \times (0.5)$, which incorporates the 50% probability of lawsuit conditional on low quality. The cost of providing that deterrence, given the assumption that the damages are equal to the cost, is also \$7.50. In other words, with \$30 of damages, the parties can replicate the one-to-one ratio on deterrence benefit to cost. But, of course, with the assumptions of bipolar litigation costs, they can do much better. Even if they were to increase the damages all the way up to (slightly below) \$80, they can provide more deterrence, but at no additional cost. With (slightly below) \$80 of damages, the benefit (size) of deterrence is \$20, or $\$80 \times (0.5) \times (0.5)$, but the cost of deterrence has stayed the same at \$7.50, producing the benefit-cost ratio of 2.67, substantially higher than 1.

Thinking about the problem through the lens of deterrence benefit-cost ratio also allows us to see why the parties will not go beyond \$80 in

setting damages, but make up the shortfall with relational sanctions. With damages at (or slightly below) \$80, we have \$20 of deterrence, leaving the gap of \$10 from desired amount of deterrence. If the parties were to cross the threshold of \$80, we know from the example that they will be able to achieve full deterrence only with legal sanctions. But at what cost? Now they are spending \$80 of additional litigation expenditure 50% of the time and with the probability difference of 50%, we get the deterrence cost of \$20, or $\$80 \times (0.5) \times (0.5)$. Since we only need \$10 of additional deterrence, incurring \$20 of additional cost produces the deterrence benefit-cost ratio of 0.5, substantially less than 1. Clearly, it is better for the parties to make up the remainder with relational sanctions, which give them the deterrence benefit-cost ratio of 1. Hence, in equilibrium, it is optimal for the parties to set damages at just below \$80 and make up the shortfall in legal sanctions with relational sanctions.

Analyzing the problem through the lens of deterrence benefit-cost ratio allows us to also think about other possibilities. Foremost, the fact that the relational sanctions come with the benefit-cost ratio of 1 depends on the fact that the seller gets to capture all of the surplus from the transactions by being able to make take-it-or-leave-it offers to the buyer. As the share of the surplus that goes to the seller gets smaller (as price goes down), the benefit-cost ratio gets worse since the deterrence benefit gets smaller while the potential loss in surplus stays the same. In such a setting, the parties will be more likely to rely more on legal sanctions. In fact, when the ratio gets lower than 0.5, that is, the seller captures less than half the surplus from the transaction, it is more efficient for the parties to rely solely on legal sanctions to solve the problem, by setting damages equal to (slightly above) \$80. This also points to an important observation that relational sanctions become most powerful against the party whose share of the surplus is the largest (for example, the party with the largest amount of bargaining power).

We can also vary the assumptions on the litigation cost. The larger the litigation cost, the lower the deterrence benefit-cost ratio. More particularly, as the low litigation cost (of \$30) gets higher, the ratio moves against using legal sanctions and, when it is substantially high, the parties will rely solely on relational sanctions. Similarly, as the high litigation cost (of \$80) gets lower, the deterrence benefit-cost ratio improves, making it more likely that the parties will use only legal sanctions to prevent seller opportunism. This thought experiment points to another important factor that determines the optimal mix of sanctions: the varia-

bility of litigation cost. In addition to the average cost of litigation, how the litigation cost varies from person to person or from issue to issue is also important. The larger the variation, the more likely it is that the parties will rely at least in some part on legal sanctions. For instance, when the seller is dealing with dispersed customers with varied access to dispute resolution mechanisms, the seller is more likely to rely on both formal and informal sanctions.

E. "Best Efforts" and Other Open-Ended Standards

So far we have assumed that the buyer gets to collect damages whenever the realized quality is low and the dispute resolution process added no additional information about the seller's behavior. Rather than adopting such a standard, the parties can also choose to utilize the dispute resolution system more heavily through the adoption of a negligence (or fault-based liability) regime. In long-term contractual relationships, the latter is often done through the adoption of open-ended standards, such as "best efforts," "reasonable efforts," or "commercially reasonable efforts." One important benefit of using such an open-ended standard is that now the parties can rely on the dispute resolution system to generate additional information about the seller's conduct and thereby more effectively deter seller misconduct. Of course, the benefits of additional information must be balanced against the potentially higher cost of dispute resolution.

The best-efforts standard can be easily incorporated into the numerical example. To collect liquidated damages, suppose now the buyer must prove, with sufficient accuracy, that (1) the seller delivered low quality, and that (2) the seller's effort fell short of the best-efforts standard.¹¹⁴ The first piece of evidence concerns the seller's output, the quality of the product. The second piece of evidence concerns the seller's input, the amount of effort she put forth in manufacturing the product. To be consistent with the original numerical example, we will maintain the assumption that courts can perfectly detect whether the seller, in fact, delivered low quality. Judicial inquiries into effort, however, are much more difficult and prone to error. To capture mistakes in the judicial

¹¹⁴ We can also think about adopting only the effort and not the quality standard, that is, allowing the buyer to prevail whenever courts find the seller put in low effort regardless of the realized quality. Such a regime, however, will be inferior to relying on both because realized quality provides an informative signal about the seller's effort choice.

process, suppose that if the seller put in high effort the court will mistakenly determine that she put in low effort with 45% probability. Likewise, if the seller puts in low effort, the court will mistakenly determine she put in high effort with 45% probability.

It is fairly straightforward to see that inclusion of such a fault-based standard will improve the outcome. Notice first that the inclusion of the best-efforts clause influences the buyer's willingness to sue after receiving low quality. Assuming that, in equilibrium, the seller puts in high effort, the buyer's expected payoff from suing upon receipt of a low quality good is $(0.45) \times d$. The 45% probability captures that, before the buyer can recover, the court must mistakenly conclude that the seller puts forth low effort.¹¹⁵ In light of this diminished prospect of recovery, to induce a buyer with litigation costs of \$30 to sue requires that the seller promise to pay at least about \$67 upon breach. Similarly, to induce the high cost litigant (\$80) to sue, the seller must promise to pay at least about \$178.

Like in our main example, the seller will want to set damages just below what is necessary to attract the high cost litigant—at an amount of, say, \$177. Consider the deterrence boost from the formal sanction under the best-efforts clause. If the seller puts in high effort, the following three events must occur before she is required to pay those damages:

- (1) The seller delivers low quality (with 25% probability);
- (2) The buyer sues (with 50% probability); and
- (3) The court mistakenly determines that the seller failed to supply best efforts when, in fact, the seller put in high effort (with 45% probability).

To compute how often the seller pays the formal penalties if she exerts high effort, we multiply together the probability of each of these events: 5.6%, or $(0.25) \times (0.5) \times (0.45)$. The expected damage payment, then, is this probability (5.6%) times the promised damage award of \$177—about \$9.96, or $(0.056) \times \$177$, in damages.

¹¹⁵ Even though the buyer does not observe the seller's choice of effort, we will show that, with sufficient deterrence, the seller puts in high effort and the buyer "rationally believes" that the seller has put in high effort. This is how the 45% probability is justified.

Similarly, if the seller instead chooses low effort, the same three events must transpire before she pays the damage award. The difference with low effort, however, is that the seller is both more likely to deliver low quality and the court is more likely to find she failed to supply best efforts. The relevant probabilities with low effort are:

- (1) The seller delivers low quality (with 75% probability);
- (2) The buyer sues (with 50% probability); and
- (3) The court correctly determines that the seller failed to supply best efforts when in fact she has supplied low effort (with 55% probability).

Multiplying the three probabilities, contingent on low effort, the seller expects to pay damages with 20.6%, or $(0.75) \times (0.5) \times (0.55)$, probability. The expected sanction from the formal sanction is thus \$36.46, or $(0.206) \times \$177$. The difference between the expected damage payment with low effort and the expected damage payment with high effort defines the deterrence kick from the formal sanction. In this example, the kicker is about \$26.50. Given that the seller gains \$30 from shirking (spending \$10 rather than \$40), the prospect of the higher formal sanction alone is not enough to induce high effort. It falls \$3.50 short.

Table IV: Comparison of Deterrence Shortfalls

	Optimal Liquidated Damages (d)	Frequency of Litigation when Low Quality	Deterrence Shortfall from Legal Sanctions
Without "Best Efforts"	\$79	0.5	\$10.25
With "Best Efforts"	\$177	0.5	\$3.50

Table IV contains a comparison of the two contracts: one with and one without a best-efforts clause. Recall that, without best efforts, the deterrence shortfall was \$10.25. Because the inclusion of the best-efforts clause reduces the deterrence shortfall, the parties can reduce the deadweight loss from relational sanctions. Suppose, to make up the rela-

tively small deterrence gap left by the formal sanction, the buyer suspends trade for one period upon a judicial finding of liability.¹¹⁶ Like in our original numerical example, the parties decide to combine the formal and the informal sanction. Notably, the informal sanction takes the same form as before: a one period suspension. Yet the suspension occurs less frequently, making it less costly to the parties. With best efforts in place, the suspension occurs only if (1) the seller delivers low quality; (2) the buyer sues; and (3) the court determines that the seller failed to provide best efforts.¹¹⁷ In the absence of the best efforts clause, the suspension occurred when (1) the seller delivers low quality and (2) the buyer sues. Despite its reduced frequency, the threat of losing the business is enough to make the seller prefer high effort. But since the threat materializes less frequently, the seller is strictly better off. A simple calculation shows that, in each period, the seller earns a profit of about \$31, which results in the long-run payoff of about \$295, or $\approx \$31 / 0.105$.¹¹⁸ This

¹¹⁶ When the damages are set at \$177.78, the actual number of suspension periods necessary is 0.8152 periods. Similar to the analysis before, we round up the numbers to make the exposition easier. We can assume that the buyer uses a mixed strategy (on suspension) to achieve that fractional punishment. Two remarks are in order. First, generally with the negligence standard, there are three possible states in which the buyer can impose reputational sanctions: (1) low quality but no litigation (due to high litigation cost); (2) low quality and no liability finding by a court; and (3) low quality and liability finding by a court. Among the three states, it is fairly straightforward to show that the second state (low quality, litigation, but no liability finding) is the least informative of the seller's deviation. However, it is a priori unclear whether the first or the third state is more informative of the seller's deviation. If, for instance, the chance of litigation is quite unlikely (that is, the probability of drawing \$30 litigation cost is much lower than 50%), it is better for the buyer to impose reputational sanctions after the first state rather than the third: doing so imposes a more efficient punishment against the seller. In that case, formal and informal sanctions will be observed separately. Second, although the number of punishment periods is similar to that used in the previous case (without the best-efforts standard), the punishment period will generally be different from the case without the best efforts clause. Given that the reputational punishment is being imposed only when the court finds the seller liable, the number of punishment periods may need to be longer to achieve the necessary deterrence. Because the reputational punishment is better targeted, however, the deadweight loss from the punishment is lower, which is the reason why the best-efforts standards perform better.

¹¹⁷ Although the buyer can still impose relational punishment whenever low quality is delivered (regardless of the litigation outcome), conditioning relational sanctions on a court's judgment is actually better because this produces more efficient deterrence. That is, the outcome in which both low quality and breach of best efforts occurs is more informative of the seller's misbehavior than any other outcome.

¹¹⁸ In this example, the buyer is willing to pay

$$p = \$75 + (0.25) \times (0.5) \times (0.45 \times \$177) - (.25) \times (0.5) \times 30 \approx \$81.21.$$

figure remains less than first best, but better than if the contract did not include best efforts. Note that the better-tailored relational sanctions translate to a lower discount of the per-period profits (0.1225 versus 0.105), producing a higher long-run surplus.

CONCLUSION

This Article started with a question: What role do contracts play in long-term relationships? As Professor Stewart Macaulay identified fifty years ago, contracting parties do not rely solely on formal contracts to ensure commitment.¹¹⁹ But they do not seem to rely exclusively on non-legal, relational sanctions, either. Even when they are in a long-term relationship, they write enforceable contracts and often rely on formal dispute resolution mechanisms. The contracts also often empower one or both parties to formally terminate their relationship. The presence of both formal and informal mechanisms raises intriguing questions, both positive and normative. The Article has argued that there are two important advantages of incorporating formal sanctions in a long-term relationship.

To recap, by allowing the parties to design the remedy and even the dispute resolution mechanism, legal sanctions can often create the desired level of deterrence at lower cost. For relational sanctions, particularly those that rely on suspension or termination of the relationship, the size of the deterrence is closely correlated with the cost of imposing that sanction. Especially when the parties can maximize the deterrence bang by allowing for generous damages recovery while minimizing the litigation cost, through, for instance, a privately structured dispute resolution system, legal sanctions can deliver the desired level of deterrence in a very cost-efficient manner.

Second, legal sanctions can form the informational basis for unleashing relational sanctions. Without the legal sanction, the market or other trading partners might not know when or whom to punish. In this way,

The seller's per-period profit is $p - \$40 - (0.25) \times (0.5) \times (0.45) \times \177 , or $\$31.25$ with $p = \$81.21$. When we use $\$31$, with one period of reputational punishment, the seller's discounted stream of payoffs can be represented as

$$V = \$31 + (0.9) \times [1 - (0.25 \times 0.5 \times 0.45)] \times V + (0.9)^2 \times (0.25 \times 0.5 \times 0.45) \times V.$$

Again, we can solve for V , to obtain

$$V = \$31 / [(0.1) + (0.9) \times (0.1) \times (0.25) \times (0.5) \times (0.45)] = \$31 / 0.105$$

which is about $\$295$.

¹¹⁹ Macaulay, *supra* note 1.

even when litigation is quite costly it can nonetheless be desirable. Relational penalties will not work without it. With respect to the informational role, conditioning liability on proxies for effort or misbehavior—through a best-efforts clause or the good faith standard—can improve the functioning of both the legal sanction and the relational sanction. The proxies provide additional noisy signals above what the court receives in “no fault” regimes (regimes where liability turns only on delivery of low quality). Subject to litigation cost concerns, the court should consider signals correlated with effort until the next signal to be examined provides no more information than what can be found in the prior ones. This recipe can be used to ground judicial investigations in good faith.

We have also noted, throughout the Article, how our findings are consistent with the existing empirical research (either regression-driven or survey-based) on relational contract and social norms. In that way, the objective of the Article has largely been descriptive. At the same time, however, the Article also generates some testable hypotheses. First is the direction of causation: One might wonder whether nonlegal, relational sanctions are usually triggered by litigation or, alternatively, if relational sanctions arise frequently even in the absence of litigation. There has been little research done on how results from dispute resolution, such as court judgments, affect the size and duration of relational sanctions. For instance, how does the market react when the court finds the defendant to have been merely “negligent” versus “reckless”? We hope to be able to tackle some of these issues in the near future.

