Economic Challenges for the Law of Contract

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This Essay introduces general equilibrium theory (GET) and mechanism design theory (MD) in a general sense (rather than in piece meal applications) to the study of contract law. As a positive matter, this introduction reveals three understudied areas: (i) when the equilibrium contract is individually rational but collectively irrational; (ii) the role of courts in market completion projects; and (iii) the implementation of renegotiation-proof mechanisms. As a normative matter, incorporating GET and MD insights into the study of contract law supports broad freedom of contract and formalist interpretative practices. Lastly, this Essay points to several areas for future research, highlighting the central role of law and economics analysis in identifying feasible mechanism design programs for contract law.

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Introduction

Contract law—the body of rules that regulates contracts generally—serves three core functions.[1] First, the law specifies the necessary conditions that private agents must satisfy to make their promises legally enforceable and selects the subset of those promises actually to enforce. Second, contract law supplies private agents with default terms. Third, the law supplies rules that facilitate transactions such as the rules regulating offer and acceptance and contract interpretation.

Law and economics (L&E) uses contract theory to study these functions. Contract theory is the economic field that studies how agents design transactions in the presence of asymmetric information.[2] In this Essay, we ask how scholars and courts can increase the theoretical and institutional sophistication of L&E contracting analyses. To do this, we situate contract law in the two foundational economic fields from which contract theory sprung—the general equilibrium theory of incomplete markets (GET) and the theory of mechanism design (MD).

GET identifies the efficient set of state-contingent Arrow-Debreu (A-D) contracts (i.e., the "A-D equilibrium contract set"). As is well known, however, this full set requires the satisfaction of unrealistic economic assumptions (i.e., complete markets) in order to exist.[3] When GET analysis incorporates real-world frictions (i.e., incomplete markets), it then teaches that the A-D equilibrium contract set might (i) not exist, (ii) not be unique, and (iii) in any event, might be inefficient.[4] These results imply that state intervention—"planning" in the GET jargon—often is

1. *See, e.g.*, Alan Schwartz & Robert. E. Scott, *The Common Law of Contract and the Default Rule Project*, 102 VA. L. REV. 1523, 1524-25 (2016).

2. *See, e.g.*, Sanford J. Grossman & Oliver D. Hart, *The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration*, 94 J. POL. ECON. 691 (1986); Oliver D. Hart & John Moore, *Property Rights and the Nature of the Firm*, 98 J. POL. ECON. 1119 (1990); Bengt Holmström, *Moral Hazard and Observability*, 10 BELL J. ECON. 74 (1979); Bengt Holmström, *Moral Hazard in Teams*, 13 BELL J. ECON. 324 (1982).

3. For a discussion of these assumptions tailored to a legal audience, see William W. Bratton & Simone M. Sepe, *Corporate Law and the Myth of Efficient Market Control*, 105 CORNELL L. REV. 675, 701-705 (2020).

4. *See* John Geanakoplos & Herakles Polemarchakis, *Existence, Regularity, and Constrained Suboptimality of Competitive Allocations When Markets Are Incomplete*, *in* 3 ESSAYS IN HONOR OF KENNETH ARROW 77 (Walter P. Heller, Ross M. Starr & David A. Starrett eds., 1986). Pollution illustrates an incomplete market. A firm may emit pollution because there is no market for emissions that prices them and charges the firm for its output. A cap-and-trade regime attempts to create such a market.

necessary to realize efficiency. We therefore ask here how contract law can play a planning role.

This approach departs from the standard L&E approach to contract failure, which assumes that every efficient contract law rule moves the set of feasible contracts closer to the A-D equilibrium set.[5] L&E scholarship thus views contract law as an institution that promotes efficiency against the benchmark of an efficient market equilibrium. On the contrary, under GET with incomplete markets, contract law must be a planning device designed to remedy market incompleteness by substituting in various ways for an inefficient (or a non-existent) equilibrium.

Three elements constitute this planning role of contract law:

i. decentralized implementation: resource allocation decisions are delegated to contracting parties;[6]
ii. state supplied mandatory, default and facilitative rules; and
iii. a state supplied adjudication system.[7]

Viewing contract law as planning has four important implications for its three core elements. First, GET analysis shows that mandatory and default rules embody different planning strategies. Efficient mandatory rules correct private allocations by not enforcing promises that would create negative externalities. Efficient default rules complete markets by reproducing the contracts that parties would have made in a world without frictions. Despite their mandatory phrasing, standards also attempt to complete markets, but raise two concerns. First, they can be insufficiently directive—behave "reasonably"—and so perform the market completion function poorly. Second, it is less costly to create standards than rules—again, behave "reasonably"—which creates an incentive for the state to overproduce standards relative to default rules.

Second, GET analysis uncovers two largely unexplored issues in contract scholarship. The first is how the state should respond when the equilibrium market contract is individually rational but collectively irrational: that is, in GET terms, when parties make and enforce contracts without considering the general equilibrium effects (i.e., the pecuniary externali-

5. This assumption is accompanied by a complementary one: that the constraints arising in incomplete markets are separable so that implementing a rule in order to satisfy one constraint will not affect how other rules function.

6. This Essay only focuses on the law of contracts as it applies to commercial parties for the reasons identified in, for example, Alan Schwartz & Robert. E. Scott, *Contract Theory and the Limits of Contract Law*, 113 YALE L.J. 541 (2003). This Essay also excludes from the analysis self-enforcing agreements between sophisticated parties where reputational mechanisms suffice to solve most contracting problems. *See, e.g.*, George Baker et al., *Relational Contracts and the Theory of the Firm*, 117 Q.J. ECON. 39, 39 (2002); Jonathan Levin, *Relational Incentive Contracts*, 93 AM. ECON. REV. 835 (2003).

7. These elements act simultaneously (rather than disjointly) to ground planning by contract law, meaning that they are both essential to the remedial strategy against market incompleteness. Put differently, freedom of contract without a system of rules and adjudication would not provide a remedy against market incompleteness, and vice versa.

ties) their choices impose on others.[8] A classic example occurs when, in bad economies, many creditors foreclose simultaneously, thereby creating "fire sales": low asset prices in consequence of a rapid shift out of the supply curve just when the demand curve is collapsing.[9] Such phenomena raise open substantive and institutional questions. Substantively, what would a general solution to the problem of collectively irrational contracts look like? Institutionally, which legal institution would be best at identifying, quantifying and internalizing pecuniary externalities?

Third, GET shows that the conditions for effective market completion are stringent.[10] The common law adjudication mechanism, consistent with GET analysis, has produced a few "transcontextual" rules (i.e., rules that solve contracting problems in various transactional environments and so do not condition on particular parties' private information). The United States has attempted broader market completion projects, such as the efforts of the American Law Institute and the Uniform Law Commission. Against GET's warning lesson, these projects rely heavily on standards,[11] which are almost costless to create. To this extent, GET analysis supports the prior work of one of us, which argues that the Uniform Commercial Code and the Restatement (Second) of Contract's turn to standards is misguided.[12]

Finally, characterizing contract law as a planning institution to complete markets has implications for the enforcement and interpretation of contracts themselves. To examine these, mechanism design theory—the study of how parties can implement optimal contracting plans—is helpful. MD theory has devised optimal theoretical mechanisms to solve asymmetric information problems affecting contractual relationships: the too little trade problem;[13] the adverse selection problem;[14] and the moral hazard problem.[15] Economists have been largely indifferent to the practical implementation problems that attend these mechanisms, however. This suggests a complementary function for law and economics scholars. Indeed, these scholars are uniquely positioned to bridge the communication gap between economists and lawyers, and so to pursue the practical

8. *See* Guido Lorenzoni, *Inefficient Credit Booms*, 75 REV. ECON. STUD. 809 (2008).

9. *Id.*

10. *See generally* R.G. Lipsey & Kevin Lancaster, *The General Theory of Second Best*, 24 REV. ECON. STUD. 11 (1956).

11. *See* Schwartz & Scott, *supra* note 1, at 1570-77.

12. *Id.*

13. *See* Roger B. Myerson & Mark A. Satterthwaite, *Efficient Mechanisms for Bilateral Trading*, 29 J. ECON. THEORY 265 (1983). An applied analysis of this problem is in Daniel Markovits & Alan Schwartz, Right, Remedies and Interpretation: A Theory of Private Law (2021) (unpublished manuscript) (on file with authors).

14. *See* George A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 Q.J. ECON. 488 (1970).

15. *See* Grossman & Hart, *supra* note 2; Hart & Moore, *supra* note 2; Holmström, *Moral Hazard and Observability*, *supra* note 2; Holmström, *Moral Hazard in Teams*, *supra* note 2.

strengths and constraints that attend the economic theory. Law and economics analyses thus should import mechanism design models into the study of contract law.

Some scholars object that while MD mechanisms theoretically lead to first best outcomes, the mechanisms are not observed in practice: they are too abstract and too complex, and assign roles to courts that courts cannot play. These objections are misconceived. To be sure, mechanism design protocols sometimes use tools that contract law prohibits, such as the reliance on penalties to encourage the revelation of private information. More deeply, though, the objections misconceive what a mechanism is. Private agents create mechanisms to structure the particular information revelation games that efficiency requires them to play. For example, sellers create auction rules that induce prospective buyers to bid their actual valuations. Recent work by Lisa Bernstein analyzing modern procurement contracts,[16] and by Ronald Gilson and his coauthors analyzing platforms to develop new products,[17] show that private agents create structures that induce each of them to reveal information to their counterparties that is necessary for efficient contracting. Though the mechanisms that the creators of MD theory put forth as proofs of concept are not seen, the basic idea is instantiated in practice: real world agents create mechanisms to overcome asymmetric information obstacles to efficient contracting.[18]

Integrating MD into law and economics contracting analysis is an ambitious project, which we only introduce here. We use three contract law areas to illustrate practical implementation problems: renegotiation, enforcement and interpretation. Three conclusions emerge. First, contract law rules sometimes prohibit the renegotiation-proof schemes that the economic literature has identified as helping to solve the problem of inducing agents to make relation-specific investments. In particular, the law of contract modification restricts the parties' ability to create efficient commitment devices by enforcing only oral no-modification clauses and, more generally, by creating rules that facilitate renegotiation.[19] The ques-

16. *See* Lisa Bernstein, *Merchant Law in a Merchant Court: Rethinking the Code's Search for Immanent Business Norms*, 144 U. PA. L. REV. 1765, 1781-82 (1996) [hereinafter Bernstein, *Merchant Law*]; Lisa Bernstein, *Private Commercial Law in the Cotton Industry: Creating Cooperation Through Rules, Norms, and Institutions*, 99 MICH. L. REV. 1724 (2001).

17. *See* Ronald J. Gilson, Charles F. Sabel & Robert E. Scott, *Braiding: The Interaction of Formal and Informal Contracting in Theory, Practice, and Doctrine*, 110 COLUM. L. REV. 1377 (2010).

18. We thank Lisa Bernstein for providing this insight. For an earlier effort at importing MD models into L&E contracting analysis and showing that these models are feasible in the real world, see Anup Malani & Richard T. Holden, *Renegotiation Design by Contract*, 81 U. CHI. L. REV. 151 (2014).

19. *See infra* Section II.C.1.

tion of how parties can ban renegotiations that have the effect of undoing ex ante efficient investment schemes is underexplored in the literature.[20]

Second, and relatedly, MD and GET theories coalesce on the desirability of a broad delegation to parties to create allocations: that is, on a broad role for freedom of contract. The theories also support a formalist approach to contract interpretation and enforcement. Expanding freedom of contract would help agents overcome (or avoid) constraints to the implementation of an optimal mechanism design program for contract law. Formalism in interpretation also helps to mitigate those constraints. The combination of freedom of contract and formalism reduces the likelihood that "court renegotiation"—the ex post modification of contracts by courts—will undo contractual incentives that parties create to encourage investment. This MD argument for formalism is independent of whether a contextualist court is more likely than a formalist court to recover the true meaning of a contract's words.

Finally, incorporating mechanism design theory into L&E contracting analyses introduces another unexplored question: what can symmetrically informed parties communicate to courts? Economists suggest having courts police the truthfulness of interparty communications, but this reflects an uninformed view of the judicial function. On the other hand, truthfully informing courts of payoff-relevant parameters of bargains can be a necessary aspect of efficient judicial regulation. Optimal communication between parties and courts is understudied. Arbitrators and specialized courts are a possible solution to the communication problem. Specialized courts would help reduce the trial costs of communication, expanding the set of efficient contracts parties can write. The existence of a specialized court, however, raises the question of when parties would prefer it to a generalist court.[21] Further investigation of these as well as several other questions raised by this Essay are fruitful areas for future research.

I. Markets and Contract Law

A. Contracts in Complete vs. Incomplete Markets

Much L&E research studies the constraints that bound the set of feasible contracts away from the set of fully contingent A-D contracts.[22] Restated, this analysis supposes that the market equilibrium is the benchmark for efficient contracts. But what characterizes contracts in the A-D equilibrium set?

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20. An early effort along these lines is Alan Schwartz & Joel Watson, *The Law and Economics of Costly Contracting*, 20 J.L. ECON. & ORG. 2 (2004).

21. This question is explored in Alan Schwartz & Joel Watson, *Conceptualizing Contract Interpretation*, 42 J. LEGAL STUD. 1 (2015).

22. Patrick Bolton, *Renegotiation and the Dynamics of Contract Design*, 34 EUR. ECON. REV. 303, 303 (1990) (referring generally to economic research).

These contracts are bilateral transactions (i.e., trades) pursuant to which a commodity (that can be defined abstractedly to include a promise) is exchanged against a price. If the contract is complex, (i) it will involve more than one trade, (ii) each trade will entail the exchange of a different commodity, and (iii) the contract's price will be the sum of the prices of all the contract's constituent trades. For example, consider a seller trading commodity x against price p_x, where the seller also guarantees the quality of x with warranty y against price p_y. This contract is decomposable into (i) the trade of commodity x; and (ii) the trade of warranty y, where y can be represented either as an Arrow-Debreu security contingent on some description of x (e.g., the present or future quality of x) or as a buy-back contract on x (still contingent on the present or future quality of x). More generally, in complete markets, any right (and obligation) can be described as a tradable commodity, that is, an Arrow-Debreu security.[23] In this transactional environment, the state's role should be restricted to the protection of property and the enforcement of contracts. Everything else is dealt with by the price system, which induces agents to move to the A-D equilibrium contract set.

In the real world of incomplete markets, however, the price system no longer coordinates economic actors to produce optimal allocations. GET shows that when markets are incomplete, competitive allocations are neither Pareto nor constrained-Pareto optimal.[24] That is, even if one defines the optimality of allocations relative to the limited contract set that is feasible in incomplete markets (i.e., taking into account the limited ability of agents to redistribute income across future states through tradable securities),[25] all competitive equilibria are (constrained-Pareto) suboptimal. The consequentialist prescription is that state intervention ("planning") is desirable to produce more efficient allocations.

This prescription expands the role of contract law beyond a minimal system of rules that enable price coordination. The L&E scholarship that uses market equilibria as benchmarks thus is misconceived. Rather, GET holds that the role of contract law as an institution—a planning device in GET terms—is to promote efficiency not against the benchmark of an efficient market equilibrium, but rather as a substitute for an inefficient (or non-existent) market equilibrium.

Planning by contract law, however, does not mean central planning where the planner (i.e., the state) determines allocations. Rather, free-

23. *See* ANDREU MAS-COLELL, MICHAEL D. WHINSTON & JERRY R. GREEN, MICROECONOMIC THEORY 704 (1995).

24. Constrained Pareto efficiency is the less demanding criterion that defines the optimality of markets relative to the limited ability of agents to redistribute income across future contingencies. *See* John Geanakoplos, *An Introduction to General Equilibrium with Incomplete Asset Markets*, 19 J. MATHEMATICAL ECON. 1, 7 (1990).

25. *See* Oliver D. Hart, *On the Optimality of Equilibrium When the Market Structure Is Incomplete*, 11 J. ECON. THEORY 418, 419 (1975).

dom of contract is foundational to the common law of contract, and so must be incorporated into any planning scheme.

With this as given, GET supports two basic planning strategies to improve efficiency in incomplete markets. Initially, the planner (here, the state or a court) should attempt to complete markets. Completing markets produces a Pareto improvement by making possible allocations that could not otherwise occur because the reference market does not exist (or is too costly for private actors to create) but that would take place if markets were complete. Completing existing markets, however, requires the planner to have private information about agents that often is inaccessible. Therefore, GET planning might be limited to the second strategy of "correcting allocations." This strategy holds that when market completion is not feasible, contract law should abandon the effort to make Pareto improvements in favor of promoting Pareto-constrained efficient allocations that take market incompleteness as given. The practical implication of this view is that contract law should prevent inefficient allocations that would take place at the equilibrium in incomplete markets.

B. Planning by Contract Law

The GET planning strategy therefore has two parts. The first, as just said, is to prevent inefficient allocations, which is generally done through mandatory rules. The second is to supply default rules that become implied terms in private contracts and so help to complete markets. We begin with prevention through mandatory rules.

1. Mandatory Rules

Mandatory rules either require contracts to contain a term or prohibit contracts from including a term. In the conventional account, the state prohibits terms either because a term would have been a step in creating an externality (to fix prices) or because the decision maker believes that the prohibited term could not be in any contracting agent's best interest. The second rationale is inapplicable when commercial parties would use the term[26] but otherwise raises consumer protection issues that are beyond our scope.

In a GET framework, efficient mandatory rules thus are a part of a planning strategy that corrects inefficient allocations. To this extent, GET recharacterization of mandatory rules helps illustrate a largely unexplored area of contract scholarship—one with macroeconomic implications: when the equilibrium contract is collectively irrational. This, in

26. *See* Aaron Edlin & Alan Schwartz, *Optimal Penalties in Contract*, 78 CHI.-KENT L. REV. 33 (2004); Schwartz & Scott, *supra* note 1.

economic theory, is referred to as a "pecuniary externality."[27] If agents acted cooperatively (a condition which contradicts competitive markets), they could reduce the negative effect of this externality. But coordination difficulties often prevent cooperation, and then agents make the collectively bad contracts because each agent expects to lose upon the occurrence of a "bad" state less than what the economy as whole would lose.

An example illustrates the problem. Suppose that parties were free to choose, in their lending agreements, whether to have an insolvency resolved under Chapter 7 (liquidation) or Chapter 11 (reorganization), or not to treat the issue contractually. Contractually unconstrained insolvent firms would choose reorganization too often because the equity's call option—to purchase the firm by repaying the debt—is increasing in the time to exercise and the managers get private benefits from delay. When parties anticipate that these factors would produce a costly reorganization, reorganization would not be the ex ante equilibrium contract. If every borrowing pair would contract to require the insolvent debtor to choose reorganization, a particular pair would defect to a less costly contract that would require liquidation. The parties would save on reorganization costs and the creditor would be the only seller and so could realize a high price for the debtor's assets. The creditor's high insolvency payoff would yield better lending terms for the borrower ex ante.

On the other hand, if every borrowing pair chose the liquidation contract, high reorganization and delay costs could deter a particular borrowing pair from defecting to the reorganization contract. Hence, over plausible parameter values the credit market equilibrium contract would have every party choose the liquidation contract. When distress is positively correlated across firms, the result would be fire sale prices that will reduce welfare for everyone.[28]

In this example, the equilibrium contract—the liquidation contract—is individually rational but collectively irrational. Indeed, the first best contract would have parties deferring the choice of bankruptcy chapter until insolvency occurs: for then parties could renegotiate to the ex-post efficient chapter.[29]

The question of whether there is a general solution to the problem of collectively irrational contracts remains open. Should the authority to restrict the parties' contracting space belong exclusively to the state? Or are

27. *See* Lorenzoni, *supra* note 8, at 809. In GET, any externality is a pecuniary externality (or a degenerate case of a pecuniary externality).

28. *See* Antonio E. Bernardo, Alan Schwartz & Ivo Welch, *Contracting Externalities and Mandatory Menus in the US Corporate Bankruptcy Code*, 32 J.L. ECON. & ORG. 395 (2016).

29. A second important example is the "search externality." When shopping is costly for consumers, the individually rational price for a firm to charge is higher than the competitive price. But when all firms price super-competitively, consumers search even less to the disadvantage of all. Again, the cause is that each firm does not consider the effect of its contracting choice on other firms.

there cases, such as in the example above, where courts should be empowered to not enforce collectively irrational contracts?

2. Default Rules

Many scholars believe that the principal function of contract law is to supply private agents with implied terms—default rules—that complete the private agents' contracts. The common justification for this view is that default rules increase social welfare because they do for parties what they would have done for themselves had their contracting costs been lower. Reframed in GET terms, the default-rule creation mechanism is a market completion strategy under which trades that parties have not explicitly chosen are added to the market contract.

GET results on market-completion strategies are not encouraging, however. Completing a market requires information that the planner might not have or be unable to access. The theory of second-best is even more skeptical. It predicts that when adding a market does not *fully* complete markets, a market-completion strategy might not just fail to deliver a Pareto improvement, but also produce a social welfare loss.[30] These results provide foundational economic support for earlier work from one of us defending the efficiency of a contract law system of default rules that only has a few transcontextual defaults.[31]

The common law creation mechanism for default rules must satisfy stringent conditions to be justified under the GET framework. First, the rule must solve a contracting problem that parties in widely disparate contexts face. (That is, in GET terms, the rule must add many contingent trades.) Second, the rule must be in the set of maximizing solutions to the parties' problem, which is to say that parties in disparate contexts *could have solved the problem as the court did*. Third, the rule must be consistent with the transaction the parties are conducting; otherwise, later parties will reject it. Fourth, contracting out of the rule must be costless. This property is required because the common law mechanism rests on the premise that private agents accept a rule when they do not contract away from it (i.e., accept the added contingent allocations as value maximizing). As contracting-out costs increase, this premise becomes less plausible. Finally, the rule must condition on public information.[32]

As a positive matter, the difficulty of satisfying these conditions explains why only a few transcontextual default rules have emerged from common law adjudication in the past two centuries. As a normative matter, the stringency of these conditions is consistent with the warning les-

30. *See* Hart, *supra* note 25; Lipsey & Lancaster, *supra* note 10.

31. The next few paragraphs reprise arguments in Schwartz & Scott, *supra* note 1.

32. For example, in the trade of goods, this condition requires that the traded goods be roughly homogenous. Then, whether a particular tender conforms to the contract would be public information in the agents' industry. *See id.*

son of GET that market completion strategies are difficult to realize. This lesson further suggests that a formalist approach, which limits courts' discretion in adjudication, is desirable to add stringency to the common law creation mechanism.[33]

In discrete areas, however, the rule-creation mechanism may require less stringent conditions. There are two reasons for this. First, completing local markets is a less demanding partial-equilibrium effort. Second, in these areas, the law often supplies expert courts and experts are better informed than generalist courts about efficient contingent trades. Two examples of such discrete areas are bankruptcy and corporate law. In both these areas, an expert decision maker decides cases (the bankruptcy court or the Delaware Chancery). Expertise adds value-relevant knowledge[34] (which matters under the first three conditions of the rule-creation mechanism) and partly relaxes the constraint that a common law rule must condition on public information. This is because what is public includes what the decision maker knows. There is also, however, an additional constraint: the courts' rules must be consistent linguistically with (or at least not contradict) the relevant statute (the Bankruptcy Code or the Corporate Code). How this additional constraint and the decision maker's expertise tradeoff in the rule creation process is not known. Further, even in these discrete environments, there is always the question of whether the decision maker can exactly predict the welfare effects of new defaults.[35]

Another planning tool is the sticky default. A decision maker—a court or a legislature—creates a sticky default when she enacts a rule that is costly for agents to avoid. A sticky default can have two rationales: (i) the decision maker chooses a solution that is in the set of efficient solutions to a contracting problem that agents face but is concerned that parties will not recognize the solution's efficiency; or (ii) the decision maker is pursuing a policy independent of individual welfare maximization.

The default is sticky, under the first rationale, because the decision maker mistrusts the relevant agents' ability to make maximizing choices. In particular, agents may mistakenly contract out of a default that is too easy to avoid. When the analysis is restricted to commercial contexts, however, this rationale is largely irrelevant. The second rationale raises the question of whether the state can effectively implement policies that agents would not choose in markets in which agents are informed, rational and sophisticated. This returns us to the issue of collectively irrational equilibrium contracts and pecuniary externalities.

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33. As we shall see below, this conclusion is consistent with the insights arising from mechanism design theory, under which a formalist approach promotes parties' dynamic optimization by minimizing the room for ex post judicial modification of the contract's optimization plan. *See infra* Section II.C.2.a.

34. See Bratton & Sepe, *supra* note 3, for a discussion of Delaware judicial decision-making in a GET framework.

35. *See* Schwartz & Scott, *supra* note 1.

Using sticky defaults to mitigate pecuniary externalities, however, might have unwanted effects. If the state enacts a sticky default but permits parties to control the price term or other terms, parties can undo the effect of the default. Sticky defaults thus may not stick but instead raise contracting costs, and the "avoidance contract" may be even less efficient than the original contract. More generally, it is difficult to predict whether any given rule is better than any other for any particular set of contracting parties. When opting out of the rule is costless, this is irrelevant, because parties can contract out. When contracting out is costly, however, the market completion strategy may produce an inefficiency that exceeds the inefficiency it is supposed to remedy.[36] To summarize, the state should enact a mandatory rule when the conditions for one are satisfied but otherwise should *reduce* rather than increase contracting costs. Sticky defaults are a bad idea.

3. Standards

Common law standards are a subset of mandatory rules: the duties of good faith ("gf"), fair dealing, and reasonableness cannot be disclaimed. Parties, however, can define the content of these standards. In a GET framework, this makes standards a market-completion strategy and thus functionally makes them closer to default rules than to mandatory rules.

How this creation mechanism functions is aptly illustrated by a discussion of gf. The common problem the gf rule addresses is the inability of parties to anticipate every form of strategic behavior.[37] Despite the rule's mandatory phrasing, the gf solution, if done right, satisfies the first three characteristics of efficient common law default rules (transcontextuality, acceptability constraint, and contextual consistency), and satisfies much of the fifth (public information). The gf solution is to ask whether the parties would have banned or modified the challenged behavior if they had anticipated it at the contracting stage. If a court gets the correct answer, the gf application is consistent with the parties' deal and is maximizing for them. Finally, gf and the requirement of fair dealing both condition on publicly observable behavior: the contract and what is regarded as (un)acceptable in the trade.

Regarding differences from common law default rules, gf does not satisfy the fourth characteristic (costless opt out). Similar to sticky defaults, parties cannot disclaim the duty but can avoid its force by specifying prohibited behavior in the contract or specifying the factors that, if

36. *See* Robert E. Scott, *The Case for Formalism in Relational Contract*, 94 NW. U. L. REV. 847, 850 (2000).

37. A party seldom would be disadvantaged by strategic behavior if she could costlessly reallocate her investment in the deal to other uses. Hence, gf applies when parties move sequentially, the first party makes a (partially or fully) sunk cost investment and the second party makes extra-contractual demands.

satisfied, would lead courts to find prohibited behavior.[38] Either response increases marginal contracting costs[39]: the costs above just writing "the duty of gf does not apply to this contract."[40]

Gf also *functions* much as do common law defaults. The court completes the contract with a rule it develops ex post. And the rule is a precedent when later parties do not attempt to treat the strategic behavior that led to the introduction of the rule with costly contractual definitions of good faith or long recitations of context in the whereas clauses. But because gf is costly to avoid, later parties' silence regarding gf supports a weaker inference (compared to accepting a common law default) that the result gf would direct a court to reach is in the set of maximizing solutions (i.e., increases the level of market completeness).[41]

Finally, in GET terms, standards raise two risks. First, standards are overproduced, which is contrary to GET's warning about the difficulty of effectively completing markets. Second, and relatedly, standards are less likely to add efficient contingent trades. Similar to sticky defaults, standards create the risk of inefficient contracts. This conclusion advises against relying on standards to pursue broader market-completion projects.

II. Mechanism Design and Institutional Constraints

A. A Division of Labor

In Part I, we explained how moving from the theoretical construction of complete markets to the reality of incomplete markets reframes the law of contracts as a planning device with decentralized implementation. This recharacterization has both positive and normative implications for contract law's rules and standards. But when price coordination is taken out of the picture, the problem becomes how to implement efficient contracts and what constraints hamper efficient implementation.

The economic tool that illuminates these questions is mechanism design (MD) theory, the economic field which studies mechanisms alternative to complete markets to implement an optimal social choice func-

38. *See* U.C.C. § 2-103 (AM. LAW INST. & UNIF. LAW COMM'N 1977) (gf is nondisclaimable but the contract can define the factors that would constitute a violation).

39. This cost is virtually infinite if one considers that the gf obligation imposes a set of unspecified behaviors and opting out requires parties to explicitly describe the behaviors they want the contract to allow.

40. Also, sometimes private information is relevant to a gf application. For example, a court may be unable to award damages for a violation without finding the gain that the violation precluded, which might very well be private information of the parties.

41. Parties also cannot disclaim the duties of fair dealing or behaving reasonably, but they can specify factors in the contract that would lead a court to define these duties as the parties prefer. Contractual specifications are marginally more costly than simple disclaimers, however.

tion.[42] Contract theory and mechanism design are often used as synonyms. This, however, is an oversimplification. As one commentator observed, "In contract theory, we study the optimal design of incentives for a single agent. In mechanism design, we study the optimal design of incentives for a group of agents. . . . Contract theory therefore, unlike the theory of mechanism design, does not have to deal with strategic interaction."[43] Contract theory deals with principal-agent problems, where the principal sets the contract but does not interact with the agent (unless the game is repeated). This framework has provided fundamental insights about how parties should write principal-agent contracts. However, when the goal is understanding how to design contract law *institutions* (i.e., including the interaction with the court system), necessarily more than one agent is involved. Hence, the analyst and the parties cannot abstract away from the possibility of strategic interactions and, hence, the use of MD theory.

More specifically, there are three reasons that an understanding of contract law institutions requires the use of MD theory. First, when parties are sophisticated, both of them participate in the contract design, which is inconsistent with contract theory's principal-agent assumptions. Second, in the long-term contracts that tend to characterize commercial relationships today, both parties take actions during the course of the contractual relationship and, typically, these actions are sequential. Therefore, incentives matter for both parties rather than a single agent, and strategic interactions are always a possibility.[44] Third, courts, as a constitutive element of the institutions of contract law, may also induce strategic interactions by the parties in expectation.

The involvement of courts implies that there is a division of labor between what contract theory and contract law can do in a broader MD perspective. L&E scholars, however, have paid little attention to mechanism design theory. This is unfortunate because these scholars are uniquely qualified to identify the practical constraints that attend optimal theoretical mechanisms. Economists are largely indifferent to these constraints because they consider mechanism design a reverse game theory exercise that can be carried out from scratch. In part, this is due to a lack of knowledge of systematic connections between relevant institutions, as well as of legal theories and doctrines. We do not intend to reduce the

42. *See* Jean-Jacques Laffont & Jean Tirole, *The Dynamics of Incentive Contracts*, 56 ECONOMETRICA 1153 (1988).

43. TILMAN BÖRGERS, AN INTRODUCTION TO THE THEORY OF MECHANISM DESIGN 2 (2015).

44. As an example, if the seller moves first by altering a generic product so that it is valuable to the buyer but worth little elsewhere, the buyer may attempt to renegotiate the price. In such a renegotiation, the seller's costs are sunk and so she would not be reimbursed for them. But anticipating this behavior, the seller would not agree initially to alter the generic product. Strategic behavior thus precludes an efficient transaction. MD constructs schemes that attempt to solve this problem.

role of L&E scholars to applications only, with law just a data point, however. Optimal contractual mechanisms are the product of the interaction of (i) how parties write incentives, (ii) the law of contracts, and (iii) court adjudication. Hence, the contribution of L&E scholars is essential to fully understand which optimal contractual mechanisms are *possible* in an advanced economy with incomplete markets.

B. Optimal Mechanisms

A mechanism has two components: (i) a communication device, which allows agents to aggregate their private information (in contract theory, parties exchange "messages" with each other and with the court), and (ii) a decision rule, which allows agents to map aggregated information into a decision (where formal decision authority belongs either to the parties or to the court). Optimal mechanisms induce agents to report their private information truthfully[45] so that they can implement a decision rule which replicates the allocation that would obtain in a complete market.

Contract theory and mechanism design theory have deployed mechanisms that attempt to solve four problems:

i. No trade even when trade would be efficient (i.e., Myerson-Satterthwaite theorem);[46]
ii. Adverse selection (i.e., cross-subsidization and market breakdown);[47]
iii. Inefficient effort when agents cannot observe each other's actions (i.e., moral hazard);[48] and
iv. Inefficient effort when agents can observe each other's actions but cannot verify their information to the court (i.e., moral hazard or hold-up).[49]

In this Part, we provide a brief overview of these problems and the mechanisms that respond to them. In Section II.C, we analyze relevant institutional constraints.

1. The No Trading Problem

The Myerson-Satterthwaite theorem[50] states that when the buyer's valuation v and the seller's cost c are continuously distributed over some

45. The informational revelation mechanism can be both direct, as in mechanisms under Laffont's revelation principle, or indirect, as in mechanisms under Rochet's taxation principle. *See* JEAN-JACQUES LAFFONT & DAVID MARTIMORT, THE THEORY OF INCENTIVES 48-51 (2002); Jean-Charles Rochet, *The Taxation Principle and Multi-Time Hamilton-Jacobi Equations*, 14 J. MATHEMATICAL ECON. 113 (1985).

46. Myerson & Satterthwaite, *supra* note 13.

47. *See* Akerlof, *supra* note 14.

48. *See* Holmström, *Moral Hazard and Observability*, *supra* note 2.

49. *See* Hart, *supra* note 25.

intervals and are private information,[51] then no incentive-compatible rule can satisfy both parties' interim participation constraint for all types.[52] In English, this means that a seller may demand a price that exceeds the buyer's willingness to pay or the buyer may make a bid that is below the seller's willingness to sell. As a result, the parties may not trade even though trade would be efficient (i.e., buyer value exceeds seller cost). This problem could be solved if the seller, somehow, could be assured a price high enough to equal her cost of selling and the buyer could be assured a price low enough to assure him of a positive gain. In practice, both conditions seldom can be met simultaneously, with the result that agents fail to trade in many cases where trade would be efficient.[53]

An example is useful here. Consider the case of a seller offering a widget whose cost is 0. Potential buyers' valuations of the widget are uniformly distributed between 0 and 1. Efficiency would require the seller to offer the widget at 0, and no matter what type of buyer the seller encounters, there will always be an efficient trade. If the seller were to offer the widget at 0, the social surplus would be 1/2.[54] However, the price that maximizes the seller's expected gain from trade is not 0 but 1/2,[55] which reduces the expected social surplus to 3/8.[56] Note that buyers with valuations between 0 and 1/2 will reject the seller's offer of 1/2, even though trade with such buyers would be efficient. The Myerson-Satterthwaite theorem stands in stark contrast with the Coase theorem: sometimes information problems are so pervasive that parties do leave money on the table.

Economists have developed mechanisms that yield efficient trades by subsidizing potential bargains.[57] However, the requirement of a be-

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50. Myerson & Satterthwaite, *supra* note 13.

51. For example, assume that buyer's evaluation is continuously distributed over $[v1,v2]$ and seller's evaluation over $[c1,c2]$ such that $c1 \leq v1 < c2 \leq v2$. Whether trade is efficient thus depends on the realizations of v and c.

52. Importantly, this result may obtain both when the parties do *not* know the value of their exchange and when they *do* know their valuations. *See* Markovits & Schwartz, *supra* note 13.

53. That is, because of information asymmetry, eliciting the agents' private information requires leaving them an "information rent." To require both parties to receive a rent an outsider must subsidize their trade. Outsiders do not exist, however.

54. The social surplus generated is the sum of the seller's expected surplus, which is 0, and the buyer's expected surplus which is:

$\int_0^1 v \, dv = 1/2.$

55. The seller's problem consists in determining the offer price, p, which maximizes her expected utility, that is $\max(1-p)p$, where the first term in parentheses is the probability of trading with a buyer. The solution is at $p = 1/2$.

56. At $p = 1/2$, the seller's expected utility is 1/4 and the buyer's utility surplus is:

$\int_{1/2}^1 (v - 1/2) \, dv = 1/8.$

57. *See* Markovits & Schwartz, *supra* note 13.

nevolent third-party subsidizer, if implementable at all,[58] seems to locate this solution outside contract law.

Contract law can offer little help when asymmetric information prevents parties from making contracts. Nevertheless, one possibility for future investigation is to enrich the contracting space by allowing the seller and the buyer to choose how to protect their entitlements.

i. The buyer is protected by a strong entitlement (specific performance). The seller offers a widget to the buyer at a price p_1; the buyer anticipates possibly re-trading the widget to a third party at $p_2 > p_1$.

ii. The buyer is protected by a weak entitlement (expectation damages). The seller offers the widget to the buyer at p_1, while anticipating the possibility of an alternative trade with a third party at $p_2 > p_1$ (after she has contracted with the buyer).

Whether a weak or a strong entitlement would increase the probability of efficient trade depends on the information structure. If the seller were to have private information about the third party, she would offer the buyer a contract with a lower priced widget and expectation damages, i.e., a weak entitlement. The seller would accede to a lower price because she would retain the option of trading with the third party. On the other hand, if the buyer were to have private information about future trading opportunities, the seller would offer the widget under a strong entitlement: the price would be higher but the buyer would have a right to specific performance. In either case, the parties could use the contract to increase the likelihood of efficient trade.[59]

This simple example illustrates how institutional details matter in mechanism design analysis. The example also importantly suggests that the contracting parties should be allowed to choose the remedy. The remedy vindicates the entitlement, and the optimal entitlement depends on the information structure, which is private information. In contrast, when the court chooses the remedy ex post, it undermines the viability of the parties' mechanism.

2. Adverse Selection, Moral Hazard and All Their Friends

a. Adverse Selection

Adverse selection arises when the principal lacks knowledge of her agent's specific characteristics (i.e., she cannot uncover the agent's "type"). In mild adverse selection cases, this leads to cross-subsidization;

58. Again, the issue here would be asymmetric information because it is not clear how a third party subsidizer would know how much is required. *See id.*

59. The suggestion that entitlement assignments can mitigate the Meyerson and Satterthwaite problem is in Markovits & Schwartz, *supra* note 13.

in more extreme cases, it leads to market breakdown.[60] The solutions to adverse selection concerns are found in contract theory. These solutions include "screening," when the principal initially offers a contract that induces the agent to reveal her type,[61] and "signaling," when the agent initially offers a contract that reveals her type.[62] In complex environments, either party can be the first to offer a contract so that screening and signaling can be considered together.

The basic mechanism that underlies both screening and signaling solutions is to specify a contract menu (e.g., a set of pairs of price and quantity or quality) that appeals to different agent types, so that the types are induced to sort themselves out by the contracts they choose. The question, then, is whether contract law can play a role in implementing this mechanism. We consider two contexts. In the first the adverse selection problem presents when the parties contract. This context generalizes the Myerson-Satterthwaite problem. As we saw above, the state could permit parties to add the trading of legal entitlements to menus of prices and quantities or qualities. But because courts lack the information to create menus, their role is necessarily limited to enforcing the contract menus, including entitlements, the parties generate.[63]

The second context is dynamic, when adverse selection arises during the contractual relationship, and raises a more pervasive problem. For example, suppose that parties design a mechanism that reveals the seller's type. The buyer could use this knowledge to renegotiate the contract in his favor. This creates a "ratchet" effect,[64] which undermines the sorting mechanism by inducing the parties not to reveal private information at all. In order to eliminate the ratchet effect, parties thus require a commitment not to renegotiate.[65] As shown above, this commitment is hard to enforce.

Dynamic adverse selection problems illustrate why the possibility of renegotiation-proof mechanisms is an important topic in MD theory. These mechanisms are possible because parties can include the results of a future renegotiation in the initial contract.[66] For example, consider a seller who has to sort buyers with high valuations and low valuations for a widget. In a dynamic context, the seller can give the buyer the option to receive widgets at different points in time in accordance with a decreasing

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60. *See* Akerlof, *supra* note 14; Joseph E. Stiglitz & Andrew Weiss, *Credit Rationing in Markets with Imperfect Information*, 71 AM. ECON. REV. 393 (1981).

61. *See* Michael Rothschild & Joseph Stiglitz, *Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information*, 90 Q.J. ECON. 629 (1976).

62. *See* Michael Spence, *Job Market Signaling*, 87 Q.J. ECON. 355 (1973).

63. For an example, see Alan Schwartz, *Price Discrimination with Contract Terms: The Lost Volume Problem*, 12 AM. L. & ECON. REV. 294 (2010).

64. *See* Laffont & Tirole, *supra* note 42, at 1155.

65. *See* Oliver Hart & Jean Tirole, *Contract Renegotiation and Coasian Dynamics*, 55 REV. ECON. STUD. 509, 509-10 (1988).

66. *See* Bolton, *supra* note 22, at 303-304.

price schedule, or to receive all the widgets at the end at a flat price. Because high valuation buyers lose more by postponing consumption, they will choose the first option. Hence, this bargaining protocol implements a sorting mechanism: the agents will identify themselves by their contract choice. That renegotiation-proof mechanisms are possible, however, does not mean they are easy to implement. Details matter here. For example, in complex transactional environments, parties tend to exchange non-homogenous goods over time. This implies that the parties' valuations might change as new information materializes during the course of their relationship. Failure to consider this dynamic constraint might undermine the renegotiation-proof mechanism.

As we shall see next, renegotiation-proofness also plays a key role in the design of mechanisms addressing moral hazard. Nevertheless, the economic literature has paid little attention to the practical constraints—including institutional constraints—that may affect renegotiation-proof mechanisms. We discuss some of these constraints in detail in Section II.C.1.

b. Moral Hazard Without Observability

Moral hazard (in its classic formulation) is the other principal-agent problem; it arises when the principal cannot observe the agent's actions after the parties conclude a contract. As with adverse selection, moral hazard presents a contract theory problem that only the parties can solve. Contract law, however, can enforce parties' incentive schemes. While this may seem obvious, those incentives may involve penalties or broad non-compete clauses. Current contract law thus is itself an institutional constraint, limiting the parties' ability to solve moral hazard problems.

In response, the state could facilitate the parties' ability to create renegotiation-proof mechanisms. One solution is to raise renegotiation costs by enforcing party-created restrictions on renegotiation, such as banning oral agreements. Another possible solution would be to add a third party.[67] Can courts play this role? Alternatively, can the contracting parties create a third-party decision maker who will serve that role?

We begin exploring these questions below, but our main contribution here is methodological. We suggest that these are the questions the L&E literature should address.

c. Moral Hazard with Observability and Non-Verifiability

When contracts are incomplete, moral hazard may arise if parties cannot verify payoff-relevant information to the court. As in the example above, let a contract require a party to make a specific investment up-

67. *See* Schwartz & Watson, *supra* note 20, at 24-25.

front. If that party anticipates ex post moral hazard—the other party will change the deal—and the party cannot verify her loss to a court, she will reduce her investment. There are a number of solutions to this problem in the economic literature but few are observed in practice.[68]

Ex post moral hazard with unverifiability is perhaps the key incomplete contract problem. L&E scholars have studied the problem, but have slighted the MD literature that addresses how symmetrically informed parties can efficiently communicate to a third party such as a court. Eric Maskin showed that it is possible to design a mechanism that induces the parties truthfully and publicly to verify the observed state of the world by fining them if they disagree on what the realized state is.[69] John Moore and Rafael Repullo also showed that when some dynamic is introduced in the game, revelation is truthful and implementation is unique (unlike in Maskin), as long as fines can be imposed on the parties.[70] A more radical criticism of the incomplete contract literature has come from Eric Maskin and Jean Tirole's "irrelevance theorem."[71] The theorem establishes that the parties' inability to specify future states of the world is irrelevant as long as they can specify a plan of action contingent on (future) payoffs, which can be truthfully announced in a revelation game as in Moore & Repullo. Under these results, the research question no longer is whether there are solutions to the unverifiability problem but, rather, whether those solutions are practically implementable, a question we take up next.

C. Practicable Implementation

1. Renegotiation

Renegotiation-proofness is a requirement shared by several mechanisms that are designed to solve information problems. The study of these mechanisms teaches that parties might need to commit to ex post inefficient outcomes in order to preserve ex ante efficiency. The practical im-

68. *See, e.g.*, Philippe Aghion, Mathias Dewatripont & Patrick Rey, *Renegotiation Design with Unverifiable Information*, 62 ECONOMETRICA 257 (1994); *see also* Malani & Holden, *supra* note 18 (suggesting that the Aghion-Dewatripont-Rey mechanism has actually been implemented in some instances and is, anyway, feasible in practice).

69. Eric Maskin, *Nash Equilibrium and Welfare Optimality*, 66 REV. ECON. STUD. 23 (1999) (paper first presented at the summer workshop of the Econometric Society in Paris, June 1977).

70. John Moore & Rafael Repullo, *Subgame Perfect Implementation*, 56 ECONOMETRICA 1191 (1988). More specifically, the central result of Moore & Repullo is the following: if preferences are quasi-linear, any single-valued Social Choice Rule f can be strongly subgame-perfect implemented using a sequential mechanism in which the sum of transfers equals any desired amount along the equilibrium path. This subgame-perfect implementation works well when agents have sufficiently conflicting interests (as in the case of quasi-linear utilities, where each agent benefits from a bigger transfer from another agent).

71. Eric Maskin & Jean Tirole, *Unforeseen Contingencies and Incomplete Contracts*, 66 REV. ECON. STUD. 83 (1999).

plementation question is how contract law might facilitate this commitment.[72]

Some contract law scholars have hypothesized that an instrumental use of contract law doctrines can help reduce the space of renegotiation and, therefore, improve efficiency.[73] Legal doctrines, however, cannot prevent parties from renegotiating. A more interesting question is whether parties can restrict renegotiation in the contract. This question has been raised by some prominent law and economic scholars,[74] who have defended the efficiency of anti-modification clauses against the courts' reluctance to enforce them.[75]

In general, however, contract law is unfriendly to MD solutions to the renegotiation problem. The Restatement seems to permit any modification that is "fair and equitable in view of circumstances not anticipated by the parties when the contract was made."[76] Also, the bargaining protocol in some solutions requires giving one party the ability to make a take-it-or-leave-it offer to the other.[77] The doctrine of economic duress may constrain these protocols by making take-it-or-leave-it offers unenforceable.[78] The common law pre-existing duty doctrine makes some modification promises unenforceable because they lack consideration, but this constraint is easily overcome if the parties rescind the original contract. Finally, the law bans anti-modification clauses though there is no externality.

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72. It is worth observing here that while sometimes parties in long-term contracts might seem to adopt renegotiation mechanisms, these are mere price mechanisms designed to ensure that the contract's continuation value stays above its defection value. For example, these mechanisms link the contract price to indices or they include a price bargaining clause or an arbitration clause. *See* Alan Schwartz, *Relational Contracts in the Courts: An Analysis of Incomplete Agreements and Judicial Strategies*, 21 J. LEG. STUD. 271 (1992). Economically, these mechanisms ensure that the parties' participation constraint is locally binding but other than that they do not to address information problems.

73. For example, Steven Shavell suggests that courts could void renegotiation on grounds of duress or unconscionability. Steven Shavell, *Specific Performance Versus Damages for Breach of Contract: An Economic Analysis*, 84 TEX. L. REV. 831 (2006). Instead, Robert Hillman proposes to subject the modification of the initial agreement to a substantive test of fairness or good faith. Under this test, a modification made in response to new circumstances, unanticipated at the time of contracting, would generally be enforced, while an attempt to rewrite the original terms would not. Robert A. Hillman, *Policing Contract Modification Under the UCC: Good Faith and the Doctrine of Economic Duress*, 64 IOWA L. REV. 849 (1979).

74. *See, e.g.*, Christine Jolls, *Contracts as Bilateral Commitments: A New Perspective on Contract Modification*, 26 J. LEGAL STUD. 203 (1997); Schwartz & Watson, *supra* note 20, at 24.

75. *See, e.g.*, David V. Snyder, *The Law of Contract and the Concept of Change: Public and Private Attempts to Regulate Modification, Waiver, and Estoppel*, 1999 WIS. L. REV. 607, 638-49. The rejection of anti-modification clauses rests on the view that "the parties' latest expression of intent is preferred to earlier expressions because courts should implement what parties want, not what they once wanted, and also because later intentions are likely to be better informed than earlier ones." Schwartz & Watson, *supra* note 20, at 4.

76. RESTATEMENT (SECOND) OF CONTRACTS § 89 (AM. LAW INST. 1981).

77. *See* Aghion, Dewatripont & Rey, *supra* note 68.

78. For a practical solution to this constraint, see Malani & Holden, *supra* note 18, at 172-76.

Drawing on MD, a solution to overcome the unenforceability of anti-modification clauses could be to add a third party who has an interest independent from the parties' interests and who could serve as a commitment device.[79] In some settings, we already observe similar solutions. For example, managerial golden parachutes commit firms not to change the status quo by transferring control to a third party (i.e., the bidder). Another example of a commitment device in the corporate context is the requirement of a supermajority to amend the corporate charter. A similar case is that of a debt indenture requiring a qualifying majority, or even unanimity, to modify the debt contract. Still another case is to make an irreversible investment that serves as a credible commitment to some ex post action.[80] In all of these cases, however, the commitment problem finds a solution in either the institutional complexity of the contracting parties (e.g., corporations) or the multi-party nature of the transaction.

But as we have seen, solutions are lacking in the common pure bilateral context. Here the question is how symmetrically informed parties can communicate to courts or otherwise involve them in solutions. The parties could, for example, instruct the court to allow renegotiation only upon extreme circumstances (i.e., an event verifiable by the court). Indeed, when an ex post loss is a rare possibility and yet likely to be large, ex post renegotiation might be desirable in spite of its negative effect on ex ante incentives. After all, if the parties are not able to predict the event at signing, renegotiation should have little, if any, impact on incentives. So framed, the problem becomes whether parties can efficiently communicate to courts the tradeoff on these two margins.

Arbitrators might be better than courts at evaluating the parties' information.[81] First, specialist arbitrators are better than generalist courts at evaluating ex post states, suggesting that arbitrators can better optimize between ex ante and ex post efficiency. Second, arbitrators are more likely to obey the parties' interpretative instructions than courts. And there is evidence that parties who use arbitration routinely give interpretative instructions.[82]

This raises the question of how a third party could enforce a no-renegotiation contract when the parties ex post agree to renegotiate anyway. One solution could be to delegate the appointment of specialized arbitrators from trade associations, which might exploit reputational mechanisms for enforcing the no-renegotiation term. An additional solution could be for parties themselves to create a contractual structure

79. *See* Kevin E. Davis, *The Demand for Immutable Contracts: Another Look at the Law and Economics of Contract Modification*, 81 N.Y.U. L. REV. 487 (2006).

80. For example, Dewatripont considered the case of an incumbent firm who, facing a potential entry, signs labor contracts as a commitment to excessive post-entry output. *See* Mathias Dewatripont, *Renegotiation and Information Revelation over Time: The Case of Optimal Labor Contracts*, 104 Q.J. ECON. 589, 596-97 (1989).

81. *See* Schwartz & Scott, *supra* note 1.

82. *See* Bernstein, *Merchant Law*, *supra* note 16, at 1781-82.

which would vest in third parties the legal or reputational power to enforce the no-renegotiation contract.[83]

Finally, there is court renegotiation. MD studies of renegotiation-proof contracts, regardless of the specific information problem they consider, describe renegotiation as a contractual choice. Renegotiation thus can implement an ex post Pareto improvement (though this would come at the expense of ex ante efficiency). Renegotiation, however, also can be court-mandated, in the sense that courts that interpret the contract can modify the original contract. For example, good faith and the use of a broad evidentiary base might give the court authority to redistribute contractual entitlements differently than in their original specification. We call this "court renegotiation." Unlike parties' renegotiation, court renegotiation responds to a criterion of global (i.e., Kaldor-Hicks) efficiency. Economically, however, party renegotiation and court renegotiation both jeopardize the effectiveness of the contract's incentive scheme.

2. Enforcement and Interpretation

Contractual enforcement actually is an exercise in interpretation—what is the deal?—rather than an exercise in remedy choice.[84] To be sure, there is a set of remedies that a promisee can invoke for breach. But to enforce a contract is to give the promisee the performance that she bought. To do this is to enforce the contract specifically, which requires the court to interpret it. The conjunction between enforcement and interpretation also runs in the other direction: courts' interpretative practices affect the parties' contracting behavior, because the costs of writing a contract include the expected costs of enforcing it.[85]

MD theory can contribute to the study of this conjunction in two ways. First, MD theory predicts that a formalist approach to courts' interpretative practices is more likely to promote efficient allocations. Second, the theory suggests mechanisms that can facilitate more efficient communication between parties and courts.

83. Lisa Bernstein & Brad Peterson, Managerial Contracting: A Preliminary Study (2021) (unpublished manuscript) (on file with authors).

84. Consider, for example, the use of an expectation interest remedy, which is the sum that would put the promisee in the same position she would have occupied had the promisor performed. If the parties' contract required a promisor/seller *either* to transfer specified goods *or* to transfer a sum that equals the value the goods would have had for the buyer, then either transfer would be performance. A court that orders the promisor to pay the sum thus is enforcing the parties' contract specifically. On the other hand, if the contract required the seller just to transfer the goods, then performance would be a transfer. A court that orders the seller to pay money is said to be awarding damages while a court that orders the seller to transfer goods is said to be awarding specific performance. But, properly understood, the court is awarding specific performance in both cases.

85. Schwartz & Watson, *supra* note 20, at 6.

a. Formalism

Formalism, in the Willistonian sense, defines an approach to contract interpretation where the evidentiary base for making interpretations is largely comprised of the written words. To the contrary, contextualism defines an approach where the evidentiary base reaches well beyond the contract's written words.

MD theory implies that formalism is the preferable interpretative practice, for three reasons. First, formalism reduces the likelihood of court renegotiation because it ties the court more closely to the original contract. Hence, formalism functions as a commitment device to avoid modifications. Importantly, the utility of this function does not turn on whether ex post court renegotiation is efficient.

Even when the court's exercise of its discretionary authority, enabled by legal standards or contextualist practices, selects "the best action, given the current situation," this "will not typically result in the social objective function being maximized."[86] In a dynamic setting, "current decisions of economic agents depend in part upon their expectations of future policy actions."[87] Therefore, the anticipation of changes in the court's actions will have an immediate effect on agents' current decisions, jeopardizing their ability to implement efficient plans. That is, because contextualism facilitates court renegotiation, it introduces a time-inconsistency problem into contracting that can prevent parties from optimizing their plans. This suggests that the ex ante distortions that arise from contextualism are serious.

Second, under a contextualist (i.e., renegotiation-inclined) interpretative regime, parties might use simple contracts because they present fewer interpretative issues and so reduce the likelihood of court renegotiation.[88] The use of simple contracts, however, may reduce the parties' ability to implement the sophisticated bargaining protocols that MD theory supports.

Third, economic theory predicts that formalism might provide the contracting parties with better incentives, to the extent that it functions as an imperfect monitoring system (i.e., that directs courts to employ a more restricted evidentiary base) relative to contextualism (i.e., that directs courts to employ a larger evidentiary base).[89] A monitoring system that is based only on observable outputs, and does not attempt to extract all available information, might better incentivize agents to perform by func-

86. Finn E. Kydland & Edward C. Prescott, *Rules Rather Than Discretion: The Inconsistency of Optimal Plans*, 85 J. POL. ECON. 473, 474 (1977).

87. *Id.*

88. Schwartz & Watson, *supra* note 20, at 6.

89. *Cf.* Jacques Crémer, *Arm's Length Relationships*, 110 Q.J. ECON. 275 (1995) (analyzing the incentive properties of imperfect monitoring systems relative to monitoring systems that are designed to extract all available information).

tioning as a "hard budget constraint."[90] This means that suboptimal outcomes under the contract trigger punishment and so, in expectation, incentivize performance.[91] Conversely, when the agent anticipates a "soft budget constraint," under which suboptimal outcomes might be excused, their incentives to perform are lessened. Restated, under some conditions, the incentive effect dominates the superior-information effect in promoting efficient allocations. As applied to court interpretation, this suggests that a contextualist approach that better informs courts would come at the expense of weakening the parties' ex ante incentives to perform.

At this point, however, the question arises of how one reconciles the normative implications of GET with those of MD. As we saw in Section I.B.2, GET's lesson about the difficulty of completing markets provides normative support for the common law production of default rules. To the extent formalism can be regarded as limiting the room for court discretion in adjudication and then adding further stringency to the rule creation mechanism, MD and GET point in the same normative direction. Yet, the production of optimal defaults requires courts to adjudicate many cases (i.e., to try a decision rule r several times in cases for r to harden into the default R). To this extent, GET supports more (or even systematic) court intervention, while MD establishes that court intervention should be minimal to facilitate parties' dynamic optimization strategy. How does one reconcile this apparent inconsistency between the two theoretical requirements?[92]

There are two answers. First, the common law production process of defaults is finite; there are few common law rules, which reduces the scope of this inconsistency. Second, and more substantially, the inconsistency is solved because there are two distinct issues at play: (i) the production of (default) rules and (ii) the consumption of rules. Under this distinction, the problem can be reframed: (i) is optimal when it is carried out at common law because the common law production mechanism is selective and sensitive to the parties' information;[93] however, (i) produces an externality on (ii), as court intervention limits parties' dynamic optimization. Economically, however, at the equilibrium (i) would never be

90. *See* J. Kornai, *Resource-Constrained Versus Demand-Constrained Systems*, 47 ECONOMETRICA 801 (1979). Kornai defines a hard budget constraint as one characterizing an economic environment where the occurrence of "failure"—poor performance as benchmarked against objective metrics, such as those captured by prices—leads to ex post settling up (e.g., the liquidation of the failing entity) and other forms of retribution. Conversely, a soft budget constraint is used to describe an economic environment in which the occurrence of failure triggers support (like for firms in planned economies) rather than "punishment" (for example through the liquidation of the failing entity).

91. For example, "many professors 'do not want to hear' the reasons why undergraduates do not complete their assignments, in part because they want to go back to their research and in part because they know that future students will work harder for somebody who has the reputation of not giving second chances." Crémer, *supra* note 89, at 275.

92. We thank Bob Scott for this comment.

93. *See supra* Section I.B.2.

necessary (and so no externality would ever arise), if the parties could implement the optimal mechanisms we have described in Section II.B of this Essay. Only off the equilibrium path, court intervention would be required.[94]

But, then, sophisticated parties would determine how courts should behave off the equilibrium path. If parties believed that their mechanism was not robust enough to prevent court intervention (for example, because of legal constraints), they would accept court intervention to produce rule *r* and opt for a formalist interpretative approach for the reasons discussed above. In other cases, parties could reject court intervention and therefore limit the production of *r*. Eventually, this process would slow down the production of common law rules, as courts would have less access to relevant parties' information to turn *r* into *R*. Yet we would not have zero court intervention, even for sophisticated parties. Viewed through this lens, formalism is thus the only interpretive approach that optimizes the tradeoff between (i) rule production and (ii) rule consumption.

b. Parties' Communication

Courts can enforce what parties write but can know only what parties tell them. For example, the expectation interest remedy is ex post efficient because it requires the promisor to choose the least costly path between breach and damages and performance at a loss. A court cannot protect the expectation, however, unless it can compute damages; but when these are unverifiable, parties can write a liquidated damage clause.

Therefore, the question of what symmetrically informed parties can tell courts is an interpretation issue. This issue, however, has received virtually no attention by L&E scholars. Relatedly, L&E scholars have also largely ignored the economic literature dealing with truth-telling revelation mechanisms.[95] Yet the ability of parties to write efficient contracts is increasing in their ability to communicate information to the court.

Consider a procurement example. Suppose there is a set of widgets $w_1, w_2, \ldots, w_7$. The demand for widgets is heterogenous: some buyers need w_2 while other buyers need w_6, and etc. Let a particular contracting dyad agree to trade w_5. The court should order the buyer to pay only if the seller tendered w_5, and the seller's incentive to invest efficiently in producing w_5 is increasing in the probability that she will be paid if she does. The court's task is to recover the parties' "type": that is, the widget they intended to trade.

94. Off of the equilibrium path is a familiar state to lawyers. In equilibrium, under a negligence rule there are no accidents. We do see them, though. It is an empirical question how to characterize off the equilibrium path states, but we can say generally that the phenomenon is familiar so we should talk about it.

95. An exception is Tracy Lewis & Alan Schwartz, *Pay to Play: A Theory of Hybrid Relationships*, 17 AM. L. & ECON. REV. 462 (2016).

Parties can inform the court in three ways: (i) the contract, which can contain information about the context (i.e., w_5 is necessary for producing a particular type of machine, and the contract describes the machine); (ii) the performance: the likelihood that the court will find that the parties agreed to trade w_5 is increasing in the probability that the seller tendered w_5; and (iii) the trial, at which parties can introduce evidence about their type.

An efficiency-maximizing court will develop interpretative rules that create an incentive for parties to choose the cost-minimizing mix of communication channels.[96] The above discussion suggests, again, that courts might better pursue this end by privileging a formalist approach in contract interpretation. With a formalist court, for example, parties are not incentivized to choose excessively simple contracts to avoid the higher enforcement costs of more complex contracts. This matters because effective communication might require more contractual complexity. Likewise, formalism reduces the likelihood that untruthful trial communication (i.e., the parties' ability to introduce evidence other than the written agreement in support of their preferred interpretation) might distort ex ante incentives. Further, only under a formalist approach can performance be relied upon to provide truthful information. With a formalist court, sophisticated parties can anticipate what the court will do with a good level of approximation and adjust the contract's terms accordingly (i.e., internalizing the court's behavior). As a result, the observed performance will more likely be a contract equilibrium and, therefore, truth-telling (i.e., the tender of w_5 will reflect that the parties agreed to exchange w_5). Conversely, with a contextualist court, the parties are less able to predict what the court will do. As a result, the observed performance might not implement the contract equilibrium (i.e., the seller might tender w_5 even if the parties agreed to exchange w_6).

The state also can support efficient parties' communication by intervening on two margins: reducing contract-creation costs and reducing trial costs. This recommendation challenges classic contract theory assumptions, under which the cost to parties of describing the subject of sale (in the example, a type of widget) is assumed either to be costless or infinite.[97] Standardization is a possible response to the first margin. For example, the state can create standard forms for particular widely used terms, such as a standard way to describe a warranty or to disclose an interest rate. A limit of this approach, however, is that standardization would have reduced, if any, impact on idiosyncratic contracts.

A less obvious method—but supported by the results of MD theory—is to provide specialized courts. We saw above that specialized arbitrators may facilitate the implementation of efficient revelation mecha-

96. *See* Schwartz & Watson, *supra* note 21, at 6.

97. *See* Hart, *supra note* 25.

nisms which address issues of renegotiation. The intuition can be generalized to parties' communications. An aspect of a decision maker's expertise is knowledge of the context in which parties function and what goods they usually trade. Thus, when parties anticipate decision-maker expertise, they can write shorter contracts, be more confident that the decision maker will infer their intention from what the seller does, and expect shorter trials because they can introduce less evidence. Expert decision makers, it is thought, are useful because they are more likely to make correct decisions. A perhaps more important benefit is ex ante: expert decision makers expand the set of efficient contracts parties can write. And of course cheaper trials perform the same function. The conclusion here, though, is methodological: the question of how the state can facilitate communication between parties and courts is understudied.

More broadly, the relevant policy issue is whether parties can involve courts in their implementation schemes. Economists suggest involving courts in the message games parties can create, but they do not fully consider institutional constraints. Arbitrators and expert courts are a possible response, though this raises the question of whether parties can choose the contract's decision maker.

Conclusion

We introduce general equilibrium theory and mechanism design theory in a general sense (rather than in piece meal applications) to the law and economics of contracts.

This introduction reveals three understudied scholarly areas. In the first area, the equilibrium contract is individually rational for the parties but the market outcome is inefficient. Which mandatory rules, if any, could respond to this concern? The second area involves costly information and has three facets: (i) can courts complete incomplete contracts in information poor environments? (ii) can parties efficiently communicate context and other information to courts to help courts complete or, at least interpret, second-best efficient contracts? (iii) can parties involve courts in information revelation schemes to better inform parties and so increase the set of efficient contracts? The third understudied area involves renegotiation and has three facets: (i) when is renegotiation efficient? (ii) when would renegotiation undo ex ante efficient incentive schemes? (iii) what do courts now do to foster renegotiation and what could they do to impede it?

This largely positive Essay has two normative implications. First, formalist interpretative practices are more efficient than contextualist interpretative practices. This is because parties are better than courts at solving asymmetric information problems and formalism ties courts to the ex ante contract, thus implementing (and giving parties incentives to develop) party solutions. Second, because the ex ante negative effects of re-

negotiation in undoing otherwise efficient incentive schemes dominate the ex post benefits, the law of contract modification should be amended to allow anti-modification clauses and, more generally, hamper rather than facilitate renegotiation.

Lastly, this Essay points to several directions for future research. Perhaps the most urgent is investigating the alternative mechanisms parties are already implementing—either as substitutes or as complements—to overcome the legal constraints to optimal bargaining protocols. Our intuition is that these mechanisms point to a common shortcoming in MD models. Indeed, these models assume that contracting parties are reducible to simple transactional units (e.g., a buyer and a seller), conceived as monolithic entities that make unitary decisions. In actuality, complex contracts are contracts between parties with complex organizations (e.g., corporations). This changes the space of contracting, as the dimension of possible exchanges is not bilateral but multilateral, with several important implications. The investigation of these implications should be at the center stage of future L&E contracting analysis.