CONTRACTS BETWEEN LEGAL PERSONS

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## ABSTRACT

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# Contracts between Legal Persons*

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> The duty to keep a contract at common law means a prediction that you must pay damages if you do not keep it–and nothing else.
>
> Oliver Wendel Holmes, The Path of the Law, *Harvard Law Review*, 1897.

# 1 Introduction

Contract law and the economics of contract have, for the most part, developed independently of each other. In this essay, we briefly review the notion of a contract from the perspective of lawyer, and then use this framework to organize the economics literature on contract. The review thus provides an overview of the literature for economists who are interested in exploring the economic implications of contract law. The title, *Contracts between Legal Persons,* limits the review to that part of contract law that is generic to any legal person. A legal person is any individual, firm or government agency with the right to enter into binding agreements. Our goal is to discuss the role of the law in enforcing these agreements under the hypothesis that the *legal persons* have well defined goals and objectives.[1]

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[1]For example, the field of corporate governance (see Hermalin(this volume)) is concerned with the design of legal institutions that ensure that firms have preferences that correspond to maximizing firm value.

This does not imply that the *legal persons* never make mistakes. In fact, a key ingredient to understanding the observed form of contract law requires the introduction of some imperfections in decision making. Since the seminal work of Herbert Simon, there has been little disagreement that a complete understanding of human institutions require the incorporation of errors in decision making, however there is little agreement regarding the best way to achieve this goal. In this review, we follow the widely accepted hypothesis that imperfect and asymmetric information are key ingredients into any theory of contract form. We show that this is sufficient to tie together the various strands of the literature. We then outline a plan for future research.

The review is divided into four substantive parts. The next section focuses upon the primary legal concepts on which contract law rests - including the notion of a legal person and what is meant by an enforceable agreement. The legal literature is firmly rooted in practice, namely the set of cases involving disputes between parties that have been adjudicated in court. From this perspective, this literature seems firmly grounded in reality. At the outset, we note three consequences that follow from the legal literature's focus on decided, appellate cases. First, not every contract gives rise to a dispute. Nor is every disputed contract litigated at all, let alone to an appellate decision. The set of appellate decisions is thus a random, probably biased, sample of the set of contracts actually entered and performed. Second, by their very nature, the courts can be called upon to adjudicate *any* dispute, including those that arise from badly drafted or unconsidered contracts. Third, courts do not have unlimited time to reflect on the complex issues raised in litigation; they must decide expediently. Consequently, we have not a coherent law, but rather a complex patchwork of decisions and principles that vary with the random nature of the cases brought before the courts.

In contrast, the goal of economics, particularly the work that follows from the general equilibrium theories of Walras, Arrow and Debreu, is to provide an understanding of the broad features of the economy, such as the role of markets in enhancing social welfare and measuring income and wealth inequality. Section 3 reviews the recent work on the mechanism design and incomplete contracts literature that lays the foundation for why competitive markets alone are not sufficient to ensure efficient exchange. This literature, much of which is reviewed in this handbook, begins to lay the foundation of a more complete theory of economic organization. Here we discuss that part of the theory that is needed to understand contract formation and enforcement.

The law and economics of contract is reviewed in section 4. Here we discuss the research

that, in essence, attempts to bring together sections 2 and 3 of this review. This literature asks a number of questions:

1. When parties write an incomplete contract, how should a court determine the obligations that the parties have? In the event that a party fails to perform a contract, how should a court set damages?

2. Can we explain the contracts that private parties choose in the shadow of the law?

3. Can we explain the rules that courts currently use as optimal rules? More generally, can an economic approach to the law provide a useful organizing framework for observed doctrine?

Answers to these questions would fall short of a complete theory of law. Such a theory would have two complementary parts. A normative part would identify the interpretive rules and damage remedies a court ought to adopt and implement. A positive part would provide a model of the structure and evolution of the law over time. At the moment such a theory does not exist. Aside from the sheer complexity of observed legal rules and institutions, there is generally relatively little literature that tightly links the models we discuss in this review with the available evidence.

# 2   Contract Law

In this section, we set out the legal view of contract. We begin with the legal view of agency for two reasons. First, it provides a sharp contrast with the economic view. Second, as most contracts are between firms, we require a conception of a firm and when a transaction is between firms rather than within a firm. Our conception of a firm will rely on some basic legal concepts that have consequences for the legal treatment of different types of transactions. We proceed in the second subsection to a characterization of contract law.

## 2.1   Legal Personality

The economic agent is characterized by her preferences; the legal agent is characterized by her legal capacities to hold and convey property, to make contracts, and to sue and be sued. These capacities are central to each of the different legal forms that a firm might take:

sole proprietorship, partnership, business corporation, trust, or not-for-profit corporation.[2] Natural persons (who have reached the age of majority and are mentally competent) also have these properties. Hansmann (this volume) discusses the importance of asset ownership (and, implicitly, some aspects of exposure to suit). As Hansmann notes, legal personality segregates a set of assets owned by the entity. Consider for example a corporation $C$. $C$ owns some set of assets $A$ that are subject to claims from other persons. Liability of $C$ is limited (to the asset pool $A$) because the corporate form protects the assets of other legal persons, in particular, the owners of $C$, from valid legal claims against $C$.[3]

We focus on the legal person's right to make contracts and to sue and be sued. Legal persons act through natural persons. When the legal person is simply a natural person, both action and identification of which acts are attributable to her is relatively straightforward. Many legal persons, however, are complex; they are constituted by and encompass large numbers of other legal persons, both natural and artificial. For example, law firms thirty years ago were typically organized as partnerships. Each partner was a natural person as were all employees of the partnership (but not all its clients, many of whom were corporations). Some actions of the partners and their employees were attributable to the partnerships and others not. Similarly, a business corporation has shareholders, managers, directors, employees, and customers; some members of each of these classes may be natural persons but others may be corporations. It may also own, wholly or in part, other corporations. Corporations, of course, act only through individuals.

Two bodies of law solve these problems of attribution: organizational law and agency law. Organizational law addresses problems of the internal organization of the firm or legal person. Often, in conjunction with constitutional documents of the firm – in business corporations the articles of incorporation and the by-laws - organizational law identifies a decision procedure for the firm. In business corporations, this decision procedure is complex, with final authority for most decisions given to the board of directors though some decisions require shareholder approval and many decisions are delegated to management.[4] The law of agency determines which actions may bind the legal persons. Under what circumstances, is the fictitious person

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[2]The attributes of legal personality of the different forms of business organization vary somewhat. So, for example, partnerships are not treated as "persons" for tax purposes while corporations are. More importantly, a partnership can be terminated at will by any partner at any time while corporate death (or dissolution) is more complex. For a brief introduction to the concept of legal personality see Clark (1986),section 1.2.3.

[3]The protection of assets of other legal persons is not complete. In some circumstances, a claimant $T$ on $C$'s assets may either "pierce the corporate veil" and make claims against the assets of the owner of $C$ when $A$ is insufficient to satisfy $T$'s claim or claim assets that have been transferred to third parties..

[4]On corporate law generally, see Clark (1986).

responsible for the acts of its agents such as employees? Even a natural person might benefit from having an agent, someone who can enter contracts for her and make other decisions. The law of agency governs which actions of the agent belong to the agent and which to the principal.[5] We ignore here actions that lead to harm to third parties and focus on exchange.[6] If the agent has actual or apparent authority[7] to act on behalf of the principal (here the legal person), then the principal is bound by the agent's actions while, generally, the agent has no liability to the contracting party. The principal grants authority either expressly or impliedly; in some instances, it may appear that the agent has authority even when she does not. Agency law places the risk of error on the principal. In what follows, we shall generally assume that the legal person acts through agents with actual authority.

Legal persons may also sue or be sued. We might differentiate contracts between firms from contracts between the firm and its employees and from contracts between parts of the firm in terms of the remedies available to resolve disputes. In essence, the law treats this last class of transactions – transactions internal to the firm (but not employment contracts)[8] – differently from market transactions. Several distinct questions arise here. Consider some actor X. We may ask first: What rights does X have? Second, what forum is available to adjudicate these rights? More specifically, are state courts available to adjudicate these rights? Third, and finally, if state courts are available, is X able to assert these rights in this forum? In any given dispute, the law provides complex answers to these questions. We provide a brief sketch of the legal terrain (in the United States) with respect to disputes arising from exchange.

In economics, a legal person C is usually a business corporation though, in some contexts,

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[5]Clark section 3.3 offers a brief introduction to agency principles. See also Institute (2006)

[6]When an individual acts as an agent on behalf of someone else, two questions arise. We emphasize the question raised in the text: under what circumstances is the principal responsible for the acts of its agents? This question might arise in at least two contexts: contract and tort. In the first case, agency law generally determines when the acts of the agent bind the principal to contracts that the agent makes on her behalf. When an agent harms a third party, tort liability arises and the doctrine of vicarious liability determines when the tort victim also has a claim against the principal. For economic analysis of vicarious liability see Kornhauser (1982), Sykes (1981) and Arlen and MacLeod (2005).

The second question asks under what circumstances is the *agent* relieved of responsibility for her actions. Again, the analysis of contract and tort differs. Usually, agents are not responsible to the promisee for the contracts that they enter on behalf of their principals. They might, however, be liable to the principal if they acted outside the scope of their authority. See Restatement (third) of Agency sections 6.01, 6.04, 6.10, 6.11. In tort, agents generally are responsible for actions that harm third parties though public officials in the United States benefit from a qualified immunity from tort liability for actions taken in furtherance of their official duties. See generally Restatement (Third) 7.01

[7]On apparent authority see Institute (2006) section 3.03

[8]Contracts between the firm and its employees are generally governed by contract law, employment law, or labor law.

C might be a natural person or a governmental entity. Suppose C is a business corporation. Hence, C has relations with its employees and its subsidiaries, both sets of which are sets of legal persons, with outside firms and with outside consumers. Disputes may thus arise from interactions among employees or subsidiaries or groups of employees, or between agents of the firm and outside suppliers or consumers.

The first question concerns the substantive rights the disputants have. The legal person to a large extent makes its own law to govern its internal disputes; Williamson (1991) makes this point. Thus, our corporation C has the power to determine, within limits,[9] the substantive rights that employees and subsidiaries have against it and the substantive rights that employees and subsidiaries have against each other. C's power to makes its own law, however, may be limited by state law or state law may create a set of default rules to govern without explicit internal law. Employment law provides a good example. Internal rules may not violate employment discrimination rules and the doctrine of at-will employment serves as a default rule in most jurisdictions in the United States. Of course, C and the outside firms with which it contracts also have the power, subject to the same caveats, to make their own law to govern their exchange; this power is granted by contract law.

Turn now to the second question of forum. Suppose two persons A and B, employees or subsidiaries of C, have a dispute arising under C's internal rules. As the employment contract usually delegates authority to the firm, the state courts will not resolve this dispute (unless the dispute implicates some statutory right of the employee). Nor would the parent corporation usually allow its subsidiaries to resort to the courts to resolve an internal dispute.

Now consider two unincorporated divisions D and D' of C. Neither D nor D' is a legal person for purposes of state law. However, even if they have engaged in an exchange with an "outsider" that constitutes a contract, neither D nor D' has the power to sue or be sued with respect to such a claim. To be concrete, suppose Chevrolet and Pontiac, both unincorporated subdivisions of General Motors, jointly hire an advertising firm; the agreement between Chevrolet and Pontiac provides a formula for allocating the costs incurred by the advertising firm. Any dispute between Chevrolet and Pontiac must be resolved within General Motors. (If Chevrolet and Pontiac were corporate subsidiaries of General Motors, each with a distinct legal identity, then each would have the right to sue or be sued. General

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[9]Contract law provides the parties with great latitude in structuring their relationship but other parts of state law do constrain the substantive rights. The Thirteenth Amendment to the Constitution of the United States bans slavery for instance. More relevantly, US law includes statutes that require equal treatment by race, gender, age, and disability as well as restrictions on minimum wages and various terms and conditions of employment.

Motors, however, might prohibit its subsidiaries from exercising this right.) One may view many of the contributions to this handbook (for example Hansmann (2010)) as reviews of the internal procedures and policies that firms use to govern internal disputes.

## 2.2 The Law of Contract

A full understanding of contractual exchange requires that we distinguish among four concepts: *an exchange environment, a contractual instrument, contract law* and *contractual behavior.* We discuss exchange environments in section 3.1. A contractual instrument contains the terms the parties bargained-for; contract law, by contrast, may imply terms that the parties have neglected to make explicit, interpret terms that, in the light of performance, are ambiguous, or, more rarely, impose a term on the parties; further, the remedial structure of contract law largely determines the structure of any renegotiation. Contractual behavior refers to the actions of parties to the contract in light of the contractual instrument and the prevailing law of contract.We adopt these terms because the common term "contract" is ambiguous. It refers both to the contractual instrument and to the set of obligations that result from the application of contract law to the contractual instrument.[10]

This essay begins to disentangle the role of the contractual instrument from the role of contract law in the structure of mechanisms. We also specify the constraints that contract law imposes on mechanism design by articulating some of the real features of contract law.

A contract, according to Black's Law Dictionary, is "an agreement between two or more parties creating obligations that are enforceable or otherwise recognizable at law."[11] Different legal systems have different criteria for determining the set of agreements that the law will enforce. In common law jurisdictions such as the United States and Britain, these constraints are few. The agreement must be sufficiently detailed for the court to determine the content of the bargain; in most cases an agreement that required the transfer of goods at some future date without specifying the quality or quantity of the goods or the price at transfer would be unenforceable. In addition, for a promise to perform a future action to constitute an agreement, the promisee must give "consideration" but almost any return promise or action

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[10]In what follows we try to adhere to this terminology but often the use of the term "contract" is unavoidable; usually its sense should be clear from context. The difficulty is greatest in the discussion of the mechanism design literature as that literature does not distinguish between the contractual instrument and contract law.

[11]The Restatement Second of Contracts, section 1, offers a similar definition: a promise or set of promises for the breach of which the law gives a remedy or the performance of which the law in some way recognizes as a duty". On this issue specifically, and on contract law generally, see Farnsworth (1999).

is now understood as consideration.[12]

We shall call an agreement that is enforceable at law a "contractual instrument." We may think of a contractual instrument as a (partial) list of events and associated obligations for each party. Contractual instruments, in conjunction with contract law, determine the obligations that individuals have. Though the law usually enforces oral agreements, we assume that the agreement has a written form. Thus, a contractual instrument is embodied in a fixed text that is publicly available so that the parties and any third party enforcer knows the contents of this text. The contractual instrument in conjunction with contract law determine the contractual obligations the parties have. We might say, that is, that the contractual instrument as understood against the background law of contract determines the *contract* between the parties.

### 2.2.1   What does contract law do?

Contract law guides the courts in the interpretation and enforcement of contractual instruments. In effect, the court performs three distinct tasks when it adjudicates a contract dispute. First, it finds the facts. It determines what actions the parties took and what state of the world or nature was realized. Second, it interprets the contractual instrument. Interpretation requires the court to determine what obligations the contractual instrument imposed in the realized state of the world.[13] If the contract was complete, coherent, and uncontradictory, some term specified these obligations. If the contract was incomplete, the contractual instrument may have failed to specify obligations in the realized state of the world. In this case, the court must nonetheless determine the obligations of the parties. In other instances, the contract may be poorly drafted and impose conflicting or ambiguous obligations in some state of the world.[14] Third, if the court determines that one or more parties has failed to meet its obligations under the contractual instrument, as interpreted by the court, it must enforce the contract; the court imposes a remedy. Remedies may take many forms.

This discussion of the functions of courts suggests that we assess regimes of contract law along three different axes – the process of fact determination, the interpretative practice, and the remedial regime.

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[12]See generally Farnsworth (1999) sections 2.2 -2.4. Note also that some agreements must be in writing to be enforceable.

[13]Of course, the content of the contract determines in part what facts the court must find.

[14]A poorly drafted contractual instrument might, in one or more contingencies, also specify an inefficient or otherwise inappropriate obligation. Some poorly drafted contracts impose in some events inconsistent obligations on a party. I.e., it requires the party both to do and not to do some act A.

### 2.2.2 Fact Finding

A contractual instrument specifies, against the legal backdrop, the obligations of each party. Often the obligations of the parties are state-contingent; what each party must do varies with the state of the world. Resolution of every contract dispute thus requires determination of the actions that each party took and of the realized event.

Fact-finding procedures apply across a wide of range of types of disputes and they are governed by distinct bodies of law (that generally go under the names of civil or criminal procedure and evidence).[15] We may assess these procedures along two dimensions: their accuracy and their cost. In an ideal world, fact-finding would be perfectly accurate and costless. In the real world, the invocation of courts is costly and courts themselves sometimes err in their fact finding.[16]

As we discuss below, the economic theory of contract generally distinguishes observable actions from verifiable actions. Courts costlessly observe verifiable actions with perfect accuracy; courts cannot observe unverifiable actions at any cost.[17] Most actions and events, by contrast, are only verifiable at some cost and to some degree of accuracy.

### 2.2.3 Interpretive Practices

Contract disputes often entail more than a dispute over facts. They often include disputes over the content of the contractual obligations the parties faced. A party's obligations may be unclear for several reasons: the contractual instrument may have been ambiguous so that it is unclear whether an action $a$ satisfies the contractually specified obligation or not; the contractual instrument may have been inconsistent and required that the party undertake an action that was not feasible in the realized state of the world or that the party undertake inconsistent actions; or the contractual instrument may not have contemplated the realized state of the world and so specified no obligation at all.

Contract interpretation is the legal practice that determines the obligations of the parties. These practices are complex and difficult to specify. To begin, we consider a procedural aspect of interpretive practices: the information on which the court relies in deciding what

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[15]We ignore some evidentiary rules that are specific to contract law such as the statute of frauds which requires a writing to enforce certain classes of contracts. On the statute of frauds, see Farnsworth (1999) chapter 6

[16]We note in passing that the parties may, in the contractual instrument, alter the usual, default fact-finding procedures.

[17]The economic literature treats unverifiable actions as a constraint on the contractual instrument.

obligations the parties have under the contractual instrument.[18] The practice may be more or less inclusive in its informational base. It might refer only to the fixed text of the contractual instrument or it might rely on additional information. It might for instance rely on statements during the pre-contractual negotiations of the parties. It might rely on the pre-contractual practice (if any) of the parties – i.e., it might look to prior behavior of the parties under contractual instruments dealing with the same or similar subject matter. The court might look to the course of dealing of the parties under the contractual instrument in dispute. Alternatively, the court might look to general trade practice; that is, the court might consider how individuals who regularly engage in exchange of the type governed by the disputed contractual instrument behaved under similar circumstances. We distinguish textualist practices of interpretation in which the court refers only to the written text of the contractual instrument from contextualist practices of interpretation in which the court refers to some information external to the contractual instrument as well as the text. The understanding of relational contracts generally assumes contextualist interpretation. However, this simple distinction is sufficient to classify the existing literature, which has been inattentive to the problem of interpretation.

Of course, even courts that adopt identical informational bases might have different interpretive practices. After all, an interpretive practice is a map from the space defined by the informational base into the set of obligations. Court C might impute one obligation to a given set of "facts" while court C' imputes a distinct obligation to the same set of "facts." We may better understand these imputation practices by considering the different objectives a court might pursue in interpreting the relevant informational base. The court might pursue at least three different objectives. It might seek to determine what the parties agreed to (or, if they did not contemplate the realized event, would have agreed to). To accomplish this aim, a court must recover both the preferences of the parties and their relative bargaining power.[19] Alternatively, the court might seek to determine what "normal" or "average" parties to exchanges of this type would agree to. To accomplish this aim, the court must determine the preferences of the "normal" contracting parties. Third, the court might seek to determine an "efficient" contract. Efficiency here might refer to *ex ante* incentives to invest or it might refer to efficient risk sharing. Again the court needs to recover the preferences of the parties.

In the stylized world of the economics of contract literature, the parties are rational; they would themselves thus write an efficient contract. It might thus appear that the third

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[18]Katz (2004) discusses this issue.

[19]In fact, the court needs a complete theory of how the parties would bargain.

interpretive aim simply recapitulates either of the prior two aims. This appearance however is deceptive for two reasons. First, though rational parties would seek to maximize their surplus, they might divide that surplus in many different ways. Hence, the first two aims require the court to infer the nature of a specific bargain.

Second, the contractual instruments of rational parties are thus clear and well-specified. In the commercial world, however, parties are not fully rational; they may make mistakes. Consequently, contract terms may be vague, unclear or contradictory (in the sense of requiring a party to take inconsistent actions in some state of the world. The court, in interpreting the contractual instrument, must confront these imperfections and determine what obligations the parties in fact had under the contract.

### 2.2.4 Remedial Regimes

After the court determines what happened and what obligations the parties had under the contractual instrument, it determines whether each party met its obligations under the contractual instrument (as interpreted under the prevailing contract law). If the court finds that some party did not perform as required, it offers a remedy. Again, contract law has a rich set of remedial rules. We might understand a remedial regime as giving the promisor an option: to perform or not to perform but make a damage payment. Remedial regimes differ in the option price, or the level of damages that the promisor must pay in the event of non-performance. We consider three possible remedial regimes: (expectation) damages, at-will regimes or no damages (against a backdrop of secure property rights).[20]

The standard remedy[21] for breach of contract in common law jurisdictions is expectation damages.[22] The principle of expectations damages awards the promisee her (subjective) value of performance. Of course, the court generally cannot observe this subjective valuation; the common law has developed a number of clever rules to implement the principle that, in many cases, contrive to deliver to the promisee her subjective value of performance without actually measuring it.[23] In many cases, however, the actual measure of promisee's expectation leads

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[20]Hermalin et al. (2006) surveys the economic literature on contractual remedies.

[21]Two types of deviations may occur. In some cases, lesser damages may be imposed and in some cases, specific performance, discussed in note below, may be imposed. In addition, the remedial rules of contract law are, to a certain extent, default rules. The parties may specify a level of damages in the contractual instrument that would substitute for the court measurement.

[22]In civil law countries, there is a large group of contracts for which the default remedy is specific performance, a requirement that the non-performing party meet her obligation. This requirement might be enforced by charging the breaching party with civil contempt which, in common law countries, might lead to jail time, or to large fines.

[23]Consider, for example, the rule of "cover" which permits an aggrieved buyer to purchase the contracted-

to under compensation. This under compensation results in part from the procedural rule in the United States that each party bears her own costs of litigation. This practice contrasts with the practice in Britain where the losing party bears the winner's costs of litigation as well as paying substantive damages.

Expectation damages nevertheless applies to most agreements. It differs dramatically from the common assumption in the economics of contract literature that the obligation specified in the contractual instrument will be enforced. The rule of expectation damages will lead to radically different consequences than the rule of perfect enforcement assumed in the economics of contract literature.

Traditionally, the common law excepted one large and important class of contracts from the expectation principle: employment contracts.[24] Employment contracts were subject, instead, to a form of self-help remedy. This form of employment contract is called "at-will employment." In an at-will contract, each party has the power to terminate the relation at any time; the terminated party has no claim for future wages. The doctrine of at-will employment remains the default rule governing most standard employment agreements in many states. On this account, the sole remedy of an employer who believes that its employee has violated the employment agreement is dismissal.

Finally, the law may simply protect the property rights of the parties and not enforce any agreements at all. In this regime, the parties have no access to the fact-finding or interpretive capacities of courts. Courts do, however, protect persons against bodily harm and property from appropriation by other individuals (and the government). When a promisor fails to perform, the promisee can enforce the contract only through reputational devices or refusals to deal. This regime corresponds to a regime of pure "relational" contracts.

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for goods on the spot market and to receive as damages the difference between the market price at which she covered and the contract price. This rule delivers the promisee her expectation by delivering her the goods at the contract price (on the assumption that the contracted-for goods were standardized goods available in a sufficiently "thick" spot market).

Notice that, generally, the law may offer a number of different remedial options from which the aggrieved party may choose. Section 7 of Article 2 of the Uniform Commercial Code illustrates both the panoply of options and the elective nature well. In addition, an aggrieved party might rely on either restitution or promissory estoppel rather than pure contract remedies.

[24]As noted above, courts applied the remedy of specific performance to contracts for "unique" goods. One might, however, understand the rule of specific performance as an instance (or implementation) of the expectation principle as, by delivering the contracted-for performance, delivers the promisee her expectation. At will employment, by contrast, does not deliver the value of the performance to the agent.

### 2.2.5 Concluding remarks

These brief comments suggest a rich panoply of regimes of contract law against which exchange might occur. We consider a few ideal types, all against a backdrop of security of property rights. At the extremes are anarchy and utopia, the two regimes commonly assumed in the economics of contract. Under anarchy, there is no third-party fact-finding, interpretation, or enforcement though each party remains secure in her property holdings. Under utopia, fact-finding is perfectly accurate and costless, interpretation is clear and costless, and enforcement is costless and perfect (in the sense that each party performs her stated obligation). In the world of anarchy, contracts must be self-enforcing; in utopia, the parties can costlessly bind themselves to any obligation they choose.

Courts, however, decide cases in neither an anarchic nor an Utopian world but in a world in which fact-finding, interpretation and enforcement are both costly and error-ridden. Contracts here need not be self-enforcing but they will not be perfectly enforced. Observed contracts reflect this middle ground (as well as the oddities that result from the efforts of boundedly rational or irrational agents).[25]

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[25]We have ignored some complications that arise when parties are insolvent. Our discussion thus far has assumed that the promisor is fully solvent; it can meet all claims on it. Under this assumption, the promisee understands that the promisee will either perform or pay damages as measured by the contract rule. In many actual transactions, however, and in some models, the promisor is potentially insolvent. Insolvency triggers a shift in the set of legal rules that govern disputes over contracts. Fried (1996) sets out the rules governing contracts in bankruptcy. He argues that the rules provide the trustee in bankruptcy with incentives to reject some contracts with expected gains from trade.

Consider a contract at time $t_0$ between a Seller S and a Buyer B for the delivery of one widget at a price $p$ at time $t_2$. Suppose S files for bankruptcy at time $t_1$; S is insolvent. If the contract was performed by both parties prior to $t_1$ there is no problem. Suppose therefore that S has not performed by $t_1$. There are two possibilities: (a) B has fully performed prior to $t_1$ or (b) B has not fully performed by $t_1$ (in which case the contract is executory). In situation (a), B is an unsecured creditor with no priority over any other unsecured creditors. Of course, Buyer may have taken a security interest in some asset of S's; then Buyer would have a prior claim on that asset. In principle, an economic analysis of contracting must now ask under what circumstances would we expect to see either party take a security interest in some asset? Turn now to situation (b). S faces a choice. She may either assume the contract or reject it. If she rejects the contract, then B is once again treated as an unsecured creditor of S. If S, however, assumes the contract, there are again two possibilities. S might perform the assumed contract in which case there is no problem; or S might later breach the contract. (At the time $t_1$ of the bankruptcy, the market price for widgets might be $p-2$; S therefore makes a profit by assuming the contract. At $t_2$, though, the market price may have risen to $p+2$ and S might do better if she breaches.) If S breaches subsequent to assumption of the contract, then B is an unsecured creditor of S but she now has priority over unsecured creditors whose debts were incurred prior to bankruptcy.

# 3    Transactions Costs and the Economic Model of Contract

The economic theory of contract asks two questions. First, it identifies the optimal *contractual instrument* for a specified *exchange environment,* given *contract law.* An exchange environment is specified by the preferences of the agents, the information structure among the agents and any third party enforcer, and the production technology that determines the effects of various investments by the parties on the costs and benefits of exchange. Second, it asks in what *contractual environment,* given *contract law,* would a specific *contractual instrument* be optimal.

In posing these questions, we have highlighted the role of contract law; but the economic models of contract do not model law explicitly. Implicit in the formalism are strong assumptions about the legal system. In this section, we try to uncover these assumptions about the fact-finding, interpretive, and enforcement competence of courts. The discussion proceeds as follows. Section 3.1 briefly elaborates on the Utopian ideal in economic theory. We introduce the basic seller-buyer framework that we use to discuss the literature. Section 3.2 reviews the literature on mechanism design. This literature provides general results on what is feasible given transactions costs that arise from asymmetric information. Section 3.3 discusses the foundations for incomplete contract theory, namely why parties would leave out some clauses in a contractual instrument.

## 3.1    Utopian Economic Theory

The economic theory of contract adopts the basic Arrow-Debreu model of general equilibrium as a benchmark. Its assumptions characterize economic utopia. We briefly remind the reader of the key features of utopia. Each economic agent is characterized by an endowment and a (convex) preference. The production technology is also convex. Markets are complete. Moreover, economic utopia implies legal utopia: courts have perfect fact-finding, interpretation of contractual instruments is unambiguous, and enforcement is perfect.

This assumption of complete markets requires elaboration because it rests on a very precise definition of a commodity. As elaborated in Chapter 2 of Debreu (1959), a commodity is defined by its physical characteristics, its location, and its date. Contractual instruments governing exchange on commodities markets come closest to the ideal. We may, for example, trade a contract for red winter wheat #2 available in Chicago on 1 March 2010 or a contract for red winter wheat #2 available in Kansas City on 1 February 2010. Though physically

identical, these two commodities differ both in the location at which they are delivered and the date of delivery.[26] The general equilibrium model requires that a market for every commodity, precisely defined, exist.

Actual exchange falls short of this ideal. Even the most detailed contractual instruments have gaps in their specification of the good to be exchanged. Architectural plans, for example, specify much of the subject matter of construction contracts but even the most detailed plans leave the contractor much discretion. No contractual instrument is sufficiently precise in its description of the characteristics of a good to be traded that performance can be determined with complete certainty. Nevertheless, the concept of a good and its associated price is an exceedingly useful abstraction for understanding market economies.

For purposes of our discussion, we shall suppose that all trade occurs between a buyer and seller of a good. The characteristics of the good will be denoted by $q \in Q$, where $Q$ is a set (possibly infinite) representing different possible characteristics of the good. This can have various interpretations such as the quantity delivered, the level or quality of service, and so on. In exchange, the buyer will agree to pay compensation $p$. Our observations regarding the impossibility of describing a good simply means that in practice if the seller agrees to supply $\bar{q}$ there is always a chance that the buyer and seller might not agree that seller's action met his contractual obligation. The extent to which one models the source of the disagreement depends upon the context and question at hand.

More formally, we suppose that a buyer and seller wish to enter an agreement to trade one unit of this good with preferences:

$$u_B = B(q, \theta) - p - i_b,$$

$$u_s = p - C(q, \theta) - i_s.$$

The payoff that the buyer gets from consuming the good of quality $q$ is $B(q, \theta)$, while $C(q, \theta)$ is the cost to the seller and $p$ is the monetary transfer between the two agents. This cost and benefit is a function of an underlying state variable $\theta \in \Theta$ that is realized after a contractual instrument is signed, but before production or consumption. In addition, each party is able to take an action, $i_s$ and $i_b$, after a contractual instrument is signed, that affects the distribution of the state variable. More formally we let $Pr[\theta | i_b, i_s]$ be the probability that $\theta$

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[26]In fact, the specification "Red winter wheat #2" is not perfectly precise as a particular shipment might give rise to a factual dispute concerning its conformity.

occurs given the actions $i_s$ and $i_s$.

This formulation is quite general and includes a number of the cases that have been considered in the literature (see Rogerson (1992) for a general formulation of this model). We can specify three paradigmatic exchange environments in the order they have been studied historically:

1. Agency model: the state varies with the seller's action, $\theta \sim f(.|i_s)$ is a monetary payoff whose distribution varies with seller's action, $C(q,\theta) = 0$ and $B(q,\theta) = \theta$. In addition, it is usually assumed that $u_s$ is the *ex post* payoff of the seller who is also assumed to be risk averse *ex ante,* with preferences given by $U_s = E[u(p)] - i_s$,where $u' > 0, u'' < 0$ are von Neuman Morgenstern preferences.

2. Asymmetric information trade model: $\theta = \{v, c\}$ is a random variable where $v$ and $c$ are independently and uniformly distributed over $[0, 1]$, $q \in \{0, 1\}$, $B(q, \theta) = vq$, and $C(q, \theta) = cq$. In this model, it is assumed that parties observe their own valuations before trade, but not the valuations of the other parties.

3. Holdup model: $\theta = \{\gamma, i_b, i_s\}$, where $\gamma$ is a random variable that is uncorrelated with the actions. If $\partial B/\partial i_s = \partial C/\partial i_b = 0$ then we have the *self-investment* case - the action of an agent affects its own payoff, but not the others (see Grout (1984), Hart and Moore (1988)). If $\partial C/\partial i_s = \partial B/\partial i_b = 0$ then we are in what Che and Hausch (1999) call the cooperative investment case (also studied in MacLeod and Malcomson (1993)). Parties are assumed to observe $\gamma$, $i_b$ and $i_s$ before trade occurs.

Agency theory seeks to work out the optimal compensation for a risk averse agent when the principal has a noisy signal of performance. The main insight is that contract design should take into account how the agent will modify her behavior in response to a contract. Given this insight, it is assumed that the principal chooses the most efficient contract subject to the constraint that the agent can reject the offer in favor of an outside alternative. If the principal cannot perfectly observe performance, then she needs to weigh the benefits of increased incentive pay against the cost of increased risk. When performance is multi-dimensional, she also must take into account that a reward for better performance along one dimension will lead to lower performance in other dimensions.

As Eisenhardt (1989) argues, the basic insights of the model have proven to be extremely useful for thinking about incentive issues. For example, in a classic paper Slade (1996) shows that the multi-tasking model can provide useful insights into observed contractual instruments (see Lafontaine and Slade (2010) for an update on this literature). The model

is widely used to think about tort law (see Landes and Posner (1987)). It typically assumes, however, perfect contract enforceability as well as unproblematic contract interpretation, and hence the law plays a minor role in the theory. The main exception is work that supposes that employees cannot be forced to pay damages. This assumption imposes a non-negativity constraint on pay as in Sappington (1983) and Innes (1990). This conclusion raises the question of why would the law impose such a constraint?

A more serious concern is that the theory cannot explain many features of observed contractual instruments. Hart and Holmström (1987) observes that agency theory predicts that optimal contracts should vary with any measure that provides information on either the productivity or the preferences of the parties to the contract. Yet, as Gibbons (1997) observes, these generic predictions of the model are simply inconsistent with many features of observed contractual instruments.

The model also fails to explain two other features of contractual instruments observed in practice. First, in an agency model the relative power of parties can affect the distribution of utility, but in general has no effect on the productive efficiency of the relationship. As we shall see, in practice the regulation of bargaining power is a key ingredient in many contracts. Second, there is no room for conflict or error. The principal perfectly anticipates how the agent will respond to any incentive contract, and incorporates this into contract design. As Kerr (1975) beautifully illustrates, there are many situations where this assumption simply does not hold. The next two sections deal with these issues in turn.

## 3.2    Mechanism Design - Implementing Efficient Exchange

In the paradigm agency model, the preferences of the principal and agent are assumed to be common knowlededge. Second, the model assumes that the parties may condition the obligations of either party on any performance measure that can be observed by both parties. Thus the model assumes that contractual instruments conditioned on observables present no interpretive problems and that fact-finding of any observable performance measure is perfect. In practice, neither of these assumptions are satisfied. One branch of the literature on contract relaxes these assumptions, and supposes that the relationship is characterized by precisely defined rules that govern the order in which individuals make decisions (see Laffont and Tirole (1993) for an excellent review of models in this spirit).

This approach faces two practical difficulties. First, it is assumed that the Nash equilibrium (or one of its refinements) to the game is the predicted outcome. The equilibria to a game, however, are very sensitive to small changes in the information structure. Given

that these changes are typically not observed by outside parties means that, outside of a laboratory, it is essentially impossible to empirically implement this class of models. Second, a contract between two parties specifies obligations, and payments that are to be made as a function of decisions made by the parties. In other words a contract itself defines a *game* in the sense it is used in economics. The careful modelling of this *game choice* can result in extreme complexity. This problem may be one reason it has been so difficult to narrow the gap between the economic theory of contract and scholarship on contract law.

Rather than attempt to answer the question of what is the equilibrium for a particular game, the theory of mechanism design begins with a primitive description of the environment - the preferences of individuals, and information available to each party - and then asks what are the allocation of resources possible with *some* game. This theory relates characteristics of the individuals to a set of feasible allocations of resources, both of which are potentially observable.

In this section we briefly outline two generic results, and the implicit assumptions about the legal system that underlie them. The first set of results is based upon the theory of Nash implementation. In these results, the two parties to the contract are well informed about each other's preferences and actions, but third parties (courts/government) cannot necessarily observe this information. In the second set of results, each party has private information that no other party, including the court, can observe.

### 3.2.1 Symmetric Information among the Parties and Nash Implementation

In the theory of Nash implementation, developed by Eric Maskin (1999) (this article is a reprint of a working paper that was circulated in the 1970's), the key feature of the exchange environment specifies an information structure in which, though the agents can observe each other's actions and preferences, the third-party enforcer cannot observe the preferences or actions of the private agents. This model has helped clarify the conditions under which efficient allocations can be implemented in this environment.

The main issues can be illustrated with a simple team production problem. Suppose that the preferences of the buyer and seller take the form:

$$u_B = B(q, i_b, i_s) - p - i_b,$$

$$u_s = p - i_s,$$

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where $q \in \{0, 1\}$ represents trade or not trade. Further suppose that $B(0, i_b, i_s) = 0$, that $B(1, i_b, i_s)$ is differentiable and that $i_b^*, i_s^* > 0$ solve:

$$max_{i_b, i_s} B(1, i_b, i_s) - i_b - i_s > 0.$$

Trade is efficient when the parties take the optimal actions. Further suppose that the payoff $B$ is observable, but that the actions are not observable outside the relationship. This is a version of the team production problem studied by Holmström (1982). Suppose that parties write a contractual instrument of the form $p(B)$ - namely they agree how to share the gain $B$. Holmstrom (1982) shows that in this case it is impossible to obtain an efficient allocation. It is easy to illustrate this under the hypothesis that $p(.)$ is differentiable. Notice that the conditions for the first best are:

$$\partial B/\partial i_s = \partial B/\partial i_b = 1,$$

yet under the contractual instrument $p(B)$ parties select their actions to satisfy:

$$p'(B)\partial B/\partial i_s = (1 - p'(B))\,\partial B/\partial i_b = 1.$$

For the contractual instrument $p(B)$ to implement the first best we would need

$$p'(B) = (1 - p'(B)) = 1,$$

which is clearly impossible.

Notice that these results rest on implicit models of the legal system. The courts can perfectly find all facts except the action of the agent, which is *completely* unobservable by the court. Moreover, the contractual instrument is unambiguous; it presents no problems of interpretation for the court. Finally, enforcement of the contract is costless and perfect.

Suppose that the parties can use a third-party to facilitate their exchange. Then it is possible to create a mechanism that has the efficient allocation as an equilibrium. The idea is very simple. Let $\theta = \{i_b, i_s\}$, the actions of the two parties, be the state. The parties, but not the court, can observe $\theta$. Let $p^*$ be a price at which both parties have strictly positive gains if investment is efficient. Let $\theta^*$ represent the efficient level of investment. Suppose now that each party reports to a third party their observation of the state, say $\theta_b$ and $\theta_s$ from the buyer and seller, respectively. The third party then announces the terms of trade as required by the contractual instrument and the messages $\theta_b$ and $\theta_s$.

Consider the following contract:

$$q(\theta_s, \theta_b) = \begin{cases} 1 & if\ (\theta_b, \theta_s) = \theta^* \\ 0 & if\ not \end{cases},$$

$$P(\theta_s, \theta_b) = \begin{cases} p^* & if\ (\theta_b, \theta_s) = \theta^* \\ 0 & if\ not \end{cases}.$$

Note that, under this contract, it is a Nash equilibrium for both parties to tell the truth. Moreover, given that there are strict gains from trade, it is a subgame perfect Nash equilibrium in the two stage game in which they first choose their actions and then simultaneously send a message to the third-party regarding their observation of the state.

Notice that, off the equilibrium path, this mechanism enforces no trade even though no trade is not efficient. This feature is crucial, and a necessary condition for efficient implementation in many environments.[27] Second, the efficient allocation is not the only Nash equilibrium. It is also an equilibrium of this game not to invest and to have no trade.[28]

Can a court play the role of the third party? Courts function *ex post,* after a dispute arises. The mechanism, by contrast, requires the parties to send the third party a message *ex ante* to determine the terms of trade. Courts do not serve this function; the mechanism thus requires both a third party and a court that can perfectly observe the messages sent to the third party and the actions of the two contracting parties. In addition, interpretation must be unambiguous and enforcement costless and perfect.

An important theme in this literature is the role of bargaining power. Early papers on the holdup model, such as Grout (1984) and Hart and Moore (1990), emphasize the role that *ex post* bargaining power plays in creating incentives to make relationship-specific investments. Aghion et al. (1994) make the point that mechanisms should be able to allocate the bargaining power of agents. If it can do this, then they show that it is possible to

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[27]A key ingredient in this class of models is the requirement that parties can implement an inefficient allocation in some states. If this is not possible then, as Maskin and Moore (1999) and Segal (1999) show, the set of feasible allocations may be limited. When it is possible to force an inefficient allocation, Maskin and Tirole (1999) have shown that one can drop the assumption that the good to be traded must be describable in advance (see also Segal and Whinston (this volume)).

[28]The term *Nash implementable* means that the mechanism has a *unique* equilibrium. In this case, the general results of Moore and Repullo (1988) can be used to show that, in exchange models such as this, a mechanism exists that implements the efficient allocation under the hypothesis that parties play a Nash equilibrium (see Moore (1992) for an excellent review). A necessary condition for this result is that either: 1. It is possible to implement an inefficient allocation; or 2. If parties always renegotiate inefficient allocations *ex post,* then one requires the addition of an interested third party who receives a payment in the event of a disagreement. This 3rd party effectively makes is possible to punish both parties in the event of breach.

implement the efficient allocation. We shall return to this theme at various points in the subsequent discussion as we may understand legal rules as devices that allocate bargaining power between the party. Once the parties have entered a contract, the legal rules determine the outside option available to the parties, should they choose not to perform.

### 3.2.2 Asymmetric Informaton

In many instances, the exchange environment features parties who have private information. In this situation, the solution concept is a *Bayesian Nash equilibrium.* The seminal paper in this literature, Myerson and Satterthwaite (1983), considers the problem of trading a single, indivisible good, in which case the quality of the good, $q \in [0, 1]$, represents the *probability* that there is trade. Expected benefit and costs are given by:

$$
\begin{aligned}
B\left(q, v\right) &= q \cdot v, \\
C\left(q, c\right) &= q \cdot c.
\end{aligned}
$$

where $v, c \in [0, 1]$ and are assumed to be uniformly distributed over this interval. In this case, the efficient solution is characterized by:

$$
q^*(v, c) = \begin{cases} 1 & if\ v \geq c \\ 0 & if\ not \end{cases},
$$

while price, given by $p(v, c)$, has no restrictions.

We have two cases. Suppose first that contract is possible *before* parties know their types *and* binding contracts with liquidated payments are possible. Then, from D'Aspremont and Gerard-Varet (1979), we know we can implement the first-best with a budget balancing mechanism. In this case, we consider a *direct* mechanism, that is a mechanism that requires each party to reveal to the institution implementing the mechanism her private valuation, denoted by $\hat{v}$ and $\hat{c}$ for the buyer and seller, respectively. The timing of the mechanism is as follows:

1. The buyer and seller agree upon a mechanism.

2. Each learns her private valuation, $v$ or $c$.

3. They report their values, $\hat{v}$ and $\hat{c}$ to the mechanism under the assumption that the other party reports truthfully (namely $\hat{v} = v$ and $\hat{c} = c$).

4. The mechanism determines the level of trade, $q(\hat{v}, \hat{c})$ and the transfer price, $P(\hat{v}, \hat{c})$.

This mechanism, like the mechanism of the prior section, requires a third party that is distinct from a court as the third party must act *ex ante* to determine the terms of trade as a function of the parties' reports. To implement this mechanism, the reporting requirements must be unambiguous – i.e., interpretation must be unproblematical, the court must be able to costlessly and perfectly accurately observe the reports $\hat{v}$ and $\hat{c}$, the level of trade, $q(\hat{v}, \hat{c})$ and the transfer price, $P(\hat{v}, \hat{c})$.

In this example, the optimal allocation $q^*(\hat{v}, \hat{c})$ can be implemented with the price function:

$$P(\hat{v}, \hat{c}) = E\left\{q^*\left(v, \hat{c}\right) v | \hat{c}\right\} + E\left\{q^*\left(\hat{v}, c\right) c | \hat{v}\right\} + \bar{p},$$

where $\bar{p}$ is some constant that divides the rents between the two parties. To see that this implements truth telling in equilibrium, consider the sellers expected profits under the assumption the buyer tells the truth. Let $\hat{c}(c)$ be the seller's reporting strategy given her costs $c$. In this case her expected profit, ignoring any terms that do not depend upon $\hat{c}$, are:

$$U_S(\hat{c}(c)) = E\left\{q^*\left(v, \hat{c}(c)\right) v | \hat{c}\right\} - E\left\{q^*\left(v, \hat{c}(c)\right) c\right\} + constant.$$

By construction, $q^*(v, c)$ maximizes this expression, and hence it is optimal to set $\hat{c}(c) = c$. [29] Being untruthful simply means that an inefficient level of trade is implemented, which, by construction, makes her worst off. A similar argument applies to the buyer.

Note that the parties *must* agree upon this mechanism before they know their valuations. If they learn their true values prior to negotiation over the mechanism, then, as Myerson and Satterthwaite (1983) show, it is not in general possible to implement the first best because the incentive-compatible mechanism requires that, in some states, one party receive a payoff that is less than her *ex ante* gains from trade. If the parties learn their valuations before negotiation, the mechanism must, in addition to being incentive-compatible, be individually rational - each party must receive an amount that is at least as good as her outside option. In this case, Myerson and Satterthwaite (1983) show that the first best cannot be achieved

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[29]A direct mechanism is called *incentive compatible* if it is an optimal strategy for each to report the truth whenever they expect the other agent to be truthful. Moreover, the *revelation principle* (Dasgupta et al. (1979) and Myerson (1979)) states that, for any other mechanism that one might construct, there always exists an incentive compatible, direct mechanism that yields the same information. This result might seem surprising at first, but note that the institution implementing the mechanism is not a strategic player. Any other mechanism involves agents playing equilibrium strategies that are a function of their private information - these can be transformed into a direct mechanism by having the institution play the optimal strategies on behalf of each agent, who then have an incentive to be truthful.

in all cases.

The inefficiency result depends crucially upon two-sided asymmetric information. When the exchange environment exhibits *one-sided* asymmetric information, we may again implement the first-best. When the seller's cost is easy to verify, the following mechanism implements the efficient allocation:

1. Parties agree upon a fixed payment, $\bar{p}$ from buyer to seller that covers any fixed costs of production.

2. The seller's cost $c$ is revealed.

3. The buyer makes a take-it-or-leave-it price $p$ offer to the seller.

4. Seller accepts or rejects the offer.

5. If the seller rejects the offer, the seller keeps $\bar{p}$ and there is no production. If the seller accepts, the seller produces, and is paid $\bar{p} + p$.

This mechanism again requires that interpretation be unambiguous, the relevant facts be costlessly and perfectly found, and that enforcement is perfect.

This mechanism has a unique, perfect equilibrium, namely if the buyer's valuation is greater than the seller's cost, then the buyer offers a price equal to the seller's cost ($p = c$) and the seller produces. If not, the buyer offers a 0 price and there is no production. This strategy implements the efficient allocation, and illustrates two points. First, asymmetric information per se does not imply an inefficient outcome. Second, efficiency is achieved with an allocation of authority to the informed party. The importance of authority has already been mentioned in the discussion of the holdup model above. This example illustrates that the use of contract clauses in observed contractual instruments may exist to address problems of holdup or asymmetric information, a point to which we return below.

There is also the case studied in Crémer and McLean (1988) and McAfee and Reny (1992) that shows the importance of the independence assumption. If there is some correlation in the valuations between the parties, and unlimited payments are possible, then the first best can be achieved. Here the assumption of unlimited sidepayments plays a crucial role. Levin (2003) in the context of relational contracts, and MacLeod (2003) in context of a risk averse agents, show that one can explain some features of observed contractual instruments with a model that has both correlation and constraints on the size of possible side payments.

Thus, mechanism design with asymmetric information captures formally an important transactions cost that arises when parties renegotiation terms. Williamson (1975) has long

emphasized the role that "informational impactedness" plays in shaping observed institutions (see Tadelis and Williamson (this volume) for a recent review). The mechanism design literature pushes Williamson's insight a bit further and allows us to conclude:

1. When there is *two sided* asymmetric information, and parties negotiate contract terms after learning their private information, a cost is necessarily incurred; either there is an inefficient level of trade or there is a lengthy dispute (see Crampton (1985) for a discussion of the relationship between the Myerson-Satthwaite model and bargaining under asymmetric information).

2. When there is *one sided* asymmetric information, then the outcome is inefficient if and only if the uninformed party has the bargaining power during contract renegotiation (see Gibbons (1987) and Kanemoto and MacLeod (1992)).

3. More generally, in the case of two sided asymmetric information the status quo or bargaining default can affect the efficiency of a relationship, as shown by Ayres and Talley (1995) and McKelvey and Page (2002).

## 3.3   Incomplete Contracts

Almost every contractual instrument fails to specify an obligation in every possible state of the world. Indeed, courts typically resolve disputes that arise when events occur that are relevant to the relationship, but are not addressed in the contractual instrument. For example, consider a paradigm supply example. Suppose a caterer contracts for the delivery of fresh fish to a location for an event in the afternoon, at a agreed upon price $p$. The contractual instrument is very simple; it requires the supplier to deliver by 3 pm, and emphasizes the importance of timely delivery because the fish is for an important event. Now, suppose the normally reliable supplier is involved in a traffic accident, and fails to deliver the fish which results in irreparable harm to the caterer's reputation for reliability.

The court must determine what damages, if any, should be assessed upon the supplier for breaching the promise to deliver the fish. Our example presents a classic problem of an incomplete contractual instrument. To an economist, the prevalence of these disputes is puzzling because the parties surely understand that accidents sometimes happen. The dispute does not arise from asymmetric information. As the accident was foreseen, why haven't the parties included terms in the agreement that cover such cases? A complete contractual instrument would have clauses that specify payments that would be made when

there is non-performance. In this sub-section we review the various models that have been introduced to explain why contractual instruments are incomplete. In section 4 we discuss the role of the law in completing such incomplete contractual instruments.

The role of the court and the law expands in the face of incomplete contractual instruments. Most importantly, the court must determine what obligations the parties have when an uncontracted-for event arises. In terms of our taxonomy of legal functions, interpretation is no longer unambiguous. We review the sparse literature on interpretation in section 4.1. In this section, we set the stage by cataloguing some reasons that the parties may write incomplete contractual instruments.

### 3.3.1 Incomplete State Space

The statement that "a contract is incomplete" is in fact a rather crude and not particularly helpful statement. After all, a simple rule of interpretation assures that every contractual instrument is complete. Given any contractual instrument $K$, let $E^c$ be the set of states for which there is no specified obligation. If an event $E \subset E^c$ occurs, then we can complete the contractual instrument by supposing that neither party has an obligation in this event. As one can always do this, one can always suppose, following Ayres and Gertner (1992), that contracts are *obligationally complete.* Hence, for each contractual instrument, either parties perform as specified in the agreement, or one party believes there is breach of contract, in which case she has the right to adjudication.

The need for contractual instruments to require some form of adjudication has been recognized if the formal economics literature since the seminal work of Simon (1951). This paper can be viewed as the first formal model in the economic theory of organization. Here he is trying to explain why we need an organization with a manager and employee rather than treating the employee as a market contractor who provides specified services at an agreed upon price. His idea is that a market contract requires specifying the characteristics of the good and it's price *ex ante.* In practice, one often wishes to modify the characteristics of a good after a contractual instrument has been signed. The idea here is that it is difficult to anticipate all the needs in advance, and hence one would like the right to unilaterally modify the characteristics of the good supplied *ex post.*

He suggests that this is exactly what is achieved with an employment contract - the employee agrees to supply a variety of goods, the characteristics of which are determined only at the time they are needed. Of course, the employee has to be compensated for the possibility that she will be asked to supply a good that is more costly than was anticipated. This pos-

sibility creates a trade-off - when the needs are predictable then a sales contract is optimal. Where there is greater uncertainty, then an employment relationship is preferred. The model is far from complete. However it highlights the importance of complexity for understanding the choice between contract and organization (and explains why there is a chapter on "Contracts between Legal Persons" in the Handbook of Organizational Economics). In other words, understanding how contracts fail helps us better understand the role of organziations.

Defining exactly what one means by "complex" remains an open question, or, more precisely, there are many definitions of complexity that depend upon the context. The formal model of contract we describe above supposes that a contractual instrument is a collection of event-obligation pairs. Events are subsets of the state space, which even for very simple problems becomes astronomically large (see the discussions by Williamson (1975), chapter 2 and MacLeod (2002a)). This implies that even with small costs of adding clauses to a contractual instrument, contractual instruments are likely to be very incomplete. This idea is formalized in the work of Townsend (1979) and Dye (1985) in the context of a simple risk sharing contract. They show that the fixed costs of adding terms implies that there can be only a finite number of events specified in any contractual instrument. Given that the state space is infinite, this implies that the first best cannot be achieved. Rather then exogenously fixing the cost of a adding an event, Anderlini and Felli (1994) endogenizes these costs with a model of computational complexity, and also show that the optimal contractual instrument trades off the cost of planning costs against contractual completeness.

In terms to trying to identify how transactions costs constrain, or help us explain observed contract form, this literature has not been very satisfactory because there is no obvious way to measure complexity costs. Morever, this literature faces the following logical inconsistency. It supposes that parties optimally choosing contract completeness by trading off the benefit against the cost of adding new contract terms. The difficulty is that one does not know the benefit from a new term until one explicitly explores the term, which by assumption is what one is trying to avoid. This gives rise to what Day and Pingle (1991) call the impossibility of "economizing economizing".

One approach to this problem is to model complexity as follows. Suppose that *ex ante* one knows that there are $n$ ways to build a good, but *ex post* only one of these ways is desirable. Complexity is then measured by $n$. In this environment Segal (1999) shows that the optmal contractual instrument when $n$ is large is a simple fixed price contract. Che and Hausch (1999) extend this result to the case in which parties make relationship specific investments that affect both parties' payoffs. In both cases the optimal contractual

instrument in a complex environment does not achieve the first best. Evans (2008) shows that in environments where it is possible to have multiple equilibria in the renegotiation game an efficent allocation is possible. (see Segal and Whinston (this volume) for a recent review).

### 3.3.2   Search and Planning Costs

These models illustrate how a particular measure of complexity may lead to predictions regarding observed contract form. However, as a basis for explaining observed contractual instruments there remain a number of issues. First, it is not at all obvious how to measure or think about complexity, nor is there an obvious way to count the number of possible events or products. Second, all these models suppose a level of rationality that leave no significant role for the law. Many of the cases that arrive before the courts deal with mis-understandings and errors of judgement by one or both parties to an agreement. Though Herbert Simon long argued for the need to incorporate decision making errors into economics, the progress has been slow.

One area where there has been a great deal of progress is in the use of search models in economics. These models are not typically viewed as models of bounded rationality, yet many models of artificial intelligence are based upon the search paradigm. Simon (1956) makes this point beautifully where he introduces his famous notion of satisficing. The basic idea is that when one is deciding how many alternatives to consider before making a decision, one continues until a threshold payoff is reached. At that point search stops, and a decision is reached. In the appendix to the paper he shows that this behavior can be viewed an an optimal decision where the threshold is the value from continued search, When one finds an alternative greater than this value, then it is optimal to stop.

In fact, if one applies Savage (1972) model of decision making to this problem, a person's satisfying payoff can be viewed as her *revealed* expected future gain from search. In an uncertain environment there may be no way to set such a value, and hence there is no way to conclude than individuals who satisfice are not optimizing. Rothschild (1974) makes this point formally, and shows that satisficing behavior can be viewed as rational choice under uncertainty. MacLeod (2002b) extends this idea to a model where an individual explicitly builds a formal representation, that is subsequently used to make a decision. He shows that the resulting model not only illustrates why planning is incomplete, but can be used to explain the shape of observed learning curves.

In terms of contract formation, these models imply that rational individuals may still

write contractual instruments that are not only incomplete, but also lead to outcomes that may require the intervention of a third party. The formal integration of contract theory with search begins with the Diamond and Maskin (1979) and Diamond and Maskin (1981). The former paper explores the impact of default results upon search efficiency, while the later illustrates how search creates externalities for other individuals in the market.Craswell (1988) explicitly applies this idea to the problem contract formation.

The fact that search costs may lead to an incomplete contractual instrument does not imply that observed contractual incompleteness is the result of bounded rationality. Ayres and Gertner (1989) show that asymmetric information may lead to *strategic incompleteness.* Bernheim and Whinston (1998) have extended this idea to the relational contract model.

Recently, Bajari and Tadelis (2001) have made the beautiful point that these search/planning costs can be viewed as a form of relationship specific investment. We discuss the implications of this insight for the law in the next section. Bolton and Faure-Grimaud (2005) introduce an explicit planning model and works out how these costs give rise to the incompleteness of contractual instruments, while Tirole (2009) builds on these insights with a model of contractual completeness under the assumption of enforceable agreements. He shows that planning costs can result in relational contracts that are less complete than their one-shot counterparts.

The basic message of this section is that there are effectively three important transactions costs that shape the form of observed contractual instruments. The first of these is asymmetric information - either between the two contracting parties or between the contracting parties and the third party agent used to enforce the agreement. Second, there are constraints on the the payments to individuasl that may arise either because they are wealth constrained or because of risk aversion. Finally, contractual environments are complex in the sense that parties have at best an incomplete model of how a relationship will evolve. Hence there is always some need to have a mechanism in place to deal with the inevitable disputes that arise. The recent literature has shown that one does not need to build a full blow model of bounded rationality to attack this problem. Rather, a great deal of progress can be made using the tools of search theory or the standard holdup model.

# 4   Contracting in the Shadow of the Law

In this section, we explore the interface between the economics of contract and the law of contract and discuss some of the literature that lies at this interface. Legal analysis of

contract focuses on contracting in the "shadow of the law"; the parties take into account how the remedial actions of the court might affect the *ex ante* design of contractual instruments. The analysis thus starts with an inquiry into how a court will resolve various disputes that might arise.

For the most, part the economics of contract ignores the effect of the law upon contract design. The genesis of contract theory is the canonical principal-agent model discussed above. That model only requires a very elemental theory of law. First, it is assumed that each party understands the preferences of the other, and hence both can anticipate how the other will behave. As such, there is no unanticipated "breach." Most importantly, the agency contract specifies not actions, but payments as a function of the events that occur during contract execution. As long as these events are verifiable, then the only role of the court is to enforce the transfer specified in the contract.

A common, if not ubiquitous, problem occurs when one party cannot afford to make a transfer required by a contract. In the case of agency theory, given that the state provides a complete description of the environment, this constraint is anticipated and incorporated into the design of the contractual instrument.[30] This contract design ensures that, even in this case, there is no real role for the courts because the transfers are always feasible. The issue then is not a legal one per se, but one of contract design given this constraint. There is a vast literature in corporate finance that explores the consequence for contract design when parties face limited liability.[31] These papers can be viewed as contributing to our understanding of contracting in the shadow of the law, where the shadow is the rule that limits penalties to the financial wealth of defendants. This limitation was not always the case. In the past debtors might be sent to prison or face other physical penalties. It is an open question why there has been an historical evolution toward limiting liability to one assets. See Hansmann (2010) in this volume for further discussion on the historical evolution of limits to financial liability.

We organize our discussion around the functional elements of contract law. Virtually nothing has been written about the role of the court as a finder of facts in contract disputes.[32] Some attention has been given to questions of contract interpretation. The tradi-

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[30]See Sappington (1983) and Innes (1990) for two early important contributions A party that cannot afford to pay a judgment is called "judgment-proof." This term is normally used in the context of tort law, but can also apply when a party cannot make good upon a promised payment by contract. See Lewis and Sappington (1999) for a recent contribution and discussion of this literature.

[31]See Gale and Hellwig (1985) for an early important contribution. See Bolton and Dewatripont (2005) for a comprehensive review of this vast literature.

[32]A large literature exists on the fact-finding function generally but this literature, naturally, does not

tional approach to the law and economics of contract, as beautifully reviewed in Hermalin et al. (2006), examines the doctrinal elements of a contract action and asks how different remedies might influence contract design and contractual performance. The literature, however, tends not to focus upon the fact that the breach event is *endogenous.* As MacLeod (2007) observes in a review of the literature on relational contracts, the specification of the breach event is a key determinant of the efficiency of a relational contract.

The rest of the section is divided into three parts. First, we discuss the small literature on interpretation. The second subsection addresses the problem of breach design. Third, we discuss what remedy is appropriate when breach occurs. Finally, we discuss contractual instruments that use delegation and/or authority relationships. These are very common in many commercial contracts. We show that these contractual instruments effectively determine the performance obligation *ex post* - after the contractual instrument has been signed and (some) uncertainty has been realized.

## 4.1   Contract Interpretation

Virtually all models in both the economics of contract and the economic analysis of contract law make two critical assumptions about contractual behavior. First, the models assume that contractual instrumentss are perfectly drafted: contractual instruments are clear and consistent on their face. Second, the models assume that parties to the contract have foresight and correctly anticipate the consequences of their actions, including those of the court. Neither assumption is warranted; contractual instruments are inevitably unclear and often inconsistent. They require *interpretation.* Moreover, the practice of interpretation is not completely transparent. As the important paper by Goetz and Scott (1980) observes, courts have a complex set of rules that often entail changing clearly specified performance obligations.

The economic theory of incomplete contracts does admit one important role for interpretation. When an uncontracted-for event occurs, a court must fill the gap in the incomplete contractual instrument. The court must specify the obligations of the parties to determine whether breach has occurred or not. The gap-filling ruling is often called a *default rule.* The literature on the economic analysis of contract law has generally discussed these rules as a device for reducing drafting costs. We discuss these rules in the second subsection.

Gap-filling, however, is not the sole purpose of interpretation. In the second subsection, we discuss the sparse literature that adopts a more general approach to interpretation. As noted in section 2.2, we can understand interpretation as a mapping from some set of inter-

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address how the design of a contractual instrumentshould vary with the fact-finding capacities of a court.

pretative materials that include the contractual instrument but may include other texts and actions into a set of contractual obligations for each possible event.

### 4.1.1 Some Formalism

A bit of formalism will help clarify some of the conceptual issues in this theory. Here we use a simplified version of Battigalli and Maggi (2002)'s model of contract. This model relies upon the standard mathematical model of uncertainty which, as Savage (1972) observes, makes a number of strong assumptions that we discuss in more detail below.

Battigalli and Maggi (2002) distinguish between external events relevant to a relationship and the obligations that a contract imposes upon parties. Their notion of an event is built up from *primitive sentences*, such as "it rains," "there is an accident" or "the time is 3 pm." These then define *events* in the statistical sense.[33] For example, the event

$$E = \{there\,is\,an\,accident\,on\,the\,George\,Washington\,Bridge\,at\,2pm\}$$

is built up from these primitive ingredients defining location, time and nature of the event. One might have a delivery contract that says "Deliver the fresh fish by 3pm today to 230 Mercer Street, New York City. If event $E$ or a similar event occurs, then one is excused from timely delivery."

In decision theory, a state always denotes a complete description of what has or will occur in the world. From this perspective, an event $E$ is a collection of states. Formally, the event $E$ corresponds to all possible states of the world that have an accident on the George Washington Bridge at 2 pm. Each state in this event provides a complete description not only of the past, but also of the possible future worlds.

Thus, a complete description of the world at date $t$ is itself an event - namely all the states that correspond to the observed history, and all possible future continuations of each of these histories. The accumulation of knowledge corresponds to the refinement of the states that might be possible. For example, suppose that event $E$ represents our current knowledge - namely all the states that we believe are possible, then we know event $E_1$ has occurred with certainty if and only if $E \subset E_1$. If we let $E_t$ describe an event that occurs at date $t$, then necessarily for subsequent events, $t' > t$ we have $E_{t'} \subset E_t$.

With this formalism, we may define a contractual instrument, contractual behavior, and enforcement behavior. These three definitions allow us to see the shape and role of law in

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[33]See Savage (1972) for a definitive discussion of the formal model of decision making as used in economics.

establishing a contract.

In the most basic sense, a contractual instrument can be viewed as a list of terms. A term $t_j$ is a triple $(E_j, i_j, a_j)$ where $E_j$ is the event that triggers the expectation that agent $i_j \in \{B, S\}$ (buyer or seller) will undertake an action chosen from the *set* $a_j \subset A(E_j)$, where $A(E_j)$ denotes the set of actions that are feasible at event $E_j$, and $a_j$ is a set of actions.

Two remarks about the set of "actions" may clarify the idea. First, contract terms are often understood by lawyers in particular as imposing obligations. The idea of a set of actions, however, is more general. Consider for example a contract that confers on B a ninety-day (beginning, say on 1 June 2100) option to buy Whiteacre at a price $p$. B is under no obligation to buy Whiteacre but our formalism nonetheless may capture this contract term: let $E_j = \Theta$ the universal set and let $a_j = \{exercise, not\,exercise\}$ where "exercise" means exercise the option prior to 29 August 2100.[34]

Second, the parties may describe the action set in at least two different ways. They might provide a list of tasks that the agent may perform. Or the parties may describe a performance that the agent must accomplish. Our earlier example "Deliver the fresh fish by 3pm today to 230 Mercer Street, New York City." uses a performance to describe the action set; it does not list the multitude of ways that the agent might actually deliver the fish by 3 pm – by cart at 2:59, by bicycle at 2:58, etc.[35] The manner of specification may affect the interpretive task for the court.

We now turn to the parties' contractual behavior in light of the contractual instrument and the environment. We shall term this the execution of the contract. Execution - during this period there is a *finite* sequence of events $E^{execution} = \{E^0 \supset E^1 \supset ... \supset E^n\}$, with the interpretation that if $E^t \subset E_j$ (namely event $E_j$ has occurred), then agent $i_j$ faces "obligation" $a_j$, she is "constrained" to choose from the actions in the set $a_j$. We shall call the set $B_j$ of states in $E_j$ in which $i_j$ chooses some action not in $a_j$ the breach event.

We now turn to "enforcement". Recall that each event $E^t$ includes a description of the actions taken by each party through time $t$. Consequently, the final event of stage 2 $E^n$ characterizes what has happened during the execution of the contract. If one of the parties believes that breach has occurred, she commences a law suit by identifying which term $t_k$ the other party has breached by not selecting an admissible action. The plaintiff must prove that event $E_k$ occurred and that the other party did not take an action in $a_k$. That is she

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[34]Note that the option contract contains another term $t_k$ in which $E_k = \{\theta \epsilon \Theta | \text{in } \theta, \text{ B exercised her option to buy}\}$

[35]Notice that these descriptions are incomplete. A complete description of the taks would identify the route the deliveryman took and the type of cart or bicycle she might use.

must show that $E^n \subset B_j$ for some contract term $k_j$. In that case, party $i'_j \neq i_j$[36] may ask a court of law to adjudicate and assess a transfer $T = T^{court}(K, E^n)$ from the buyer to the seller (this will be negative if the buyer wins an award against the seller).[37]

Though this set-up appears very simple, it is a very complex model that, as we shall show, captures many features of observed contractual instruments. Observe that there is no need for a contractual instrument to specify an obligation for all events. If, for all terms, $E_j \cap E^n = \emptyset$, then the contractual instrument imposes no obligation. In addition, the model formally defines what we mean by *The Law:* the law has costless and perfectly accurate fact finding, costless interpretation that imposes the obligation literally (and unambiguously) stated in the contractual instrument, and provides a remedy specified by the function $T^{court}$ that determines damages as a function of what has occurred. Here we have placed no restrictions on this function, and so we do not even have to assume the court observes all the detail in $E^n$. A legal system ensures that such a function exists, though nothing in the model implies that the parties know the function for all possible $K$.

Of course, we know that the law is not as clear-cut as the model specifies. Facts are difficult to find; contractual instruments impose obligations that are unclear, and the function $T^{court}$ cannot be perfectly predicted. Lawyers help clients understand how the courts will rule for different contractual instruments $K$. A past *case* is a contractual instrument $K$, an account of what happened, $E^n$ and a final ruling by the courts, $T^{court}(K, E^n)$. Past cases provide insight into how the courts are likely to rule in the future.[38] Legal scholarship on contract law explores, among other things, ways to organize the law so we may better predict how courts will rule in specific cases and new rules for the courts when it is felt that existing rules are inadequate.

These considerations are for the most part missing in the economics literature because, if one begins with the hypothesis that parties have a good and clear understanding of their environment, then they can always, in principle, replace the court by terms that specify the monetary transfers that they would want - terms called liquidated damages clauses. Parties might consider breaching such an agreement, but under the assumption of perfect

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[36]If $E^n \subset B_j$ then this implies that party $i_j$ has breached, given the right to the *other* party, $i'_j$ to bring suit.

[37]For those unfamiliar with this notation, note that the notion of a state is very general in that the event $E^n$ will contain all the information regarding the sequence of actions that has occurred during this relationship. It has been shown by Mertens and Zamir (1985) that this language is sufficiently rich that it can also incorporate believes of agents in a consistent fashion. A discussion of these issues if far beyond the scope of the current review.

[38]We do not need to explicitly state the date here since that information is contained in $E^n$, as is the information on $K$. We include $K$ explicitly since it is the design variable we are interested in studying.

enforceability the courts could be called upon to use their powers of seizure to ensure the transfer.

In economics, the dividing line between contract theory and other areas of the theory of organization such as corporate governance or human resource management, typically turns on the notion that courts merely enforce the terms of a written agreement. In contrast, corporate governance focuses upon the design of decison rights for officers of the corporation. In fact, a legally binding contractual instrument must explicitly deal with the allocation of decision rights over the relationship. That is, parties to a legally binding agreement provide each other the right to take the other party to a court of law for the adjudication of the contractual instrument in the event of a breach. In the absence of courts, parties would have to rely upon other instruments to enforce an agreement, such as reputation effects, or threats to reduce trade in the future, or even possibly threats of violence (see MacLeod (2007) and Malcomson (this volume)).

### 4.1.2 Default Rules

A default rule determines the obligations of the parties when an event occurs about which the contractual instrument is "silent." To reach this conclusion, of course, the court must first interpret the contractual instrument as not having addressed the realized event. A prominent view is that courts should fill in gaps using so called "majoritarian defaults". Under a majoritarian default rule, the court supplies the term that the majority of individuals would prefer. Economic analysts of contract law justify this choice on the grounds that it minimizes drafting costs. (Goetz and Scott (1983)). Given that the majority of contracts are not litigated, it is not at all obvious that such a notion is well defined or knowable to contracting parties.

Even knowable, the determination of the optimal default rule *ex post* is challenging. Mechanism design theory, outlined above (section 3.2), reveals the inherent tension between *ex post* and *ex ante* efficiency. The implementation of *ex ante* efficient contracts often entails the use of actions that are sometimes *ex post* inefficient. If an event occurs that is not addressed in the contractual instrument, how does one tell if it is a foreseen event that parties have delegated to the courts to fill, or one that is unforeseen? If the event is unforeseen then, as Hart (1990) observes, the consequences upon reaching that state can have no effect upon *ex ante* decisions. In that case, the efficient rule is always to choose an *ex post* efficient allocation. As we have discussed above, a defining feature of *expectation damages* is that it is an attempt to achieve *ex post* efficiency. Hence, though the rule of expectation

damages does not necessarily achieve *ex ante* efficiency, the fact that is approximates an *ex post* efficient allocation makes it an appropriate rule for unforeseen gaps in a contractual instrument.

Ayres and Gertner (1989, 1992) and Bebchuk and Shavell (1991) argued that, in contractual environments with asymmetric information, courts should adopt a "penalty" default that induces the informed party to reveal her private information. These papers consider models with two types of buyers, and for which the optimal level of seller's investment is a function of the buyer's type. The buyer's type is assumed to be private information. The authors show that a default rule that "penalized" buyers with a high type would, under the appropriate circumstances, induce high type buyers to reveal their type. This model, however, failed to clearly distinguish penalty from majoritarian defaults. If low type buyers constituted a majority of the buyer population, then they would be indifferent between the two rules considered by the court.

### 4.1.3 Interpretation Generally

The focus on default rules arises naturally in a world in which contracting parties are fully rational and have perfect foresight. Interpretation will play a larger role in worlds where agents err and draft defective contractual instruments. Several defects may arise. To catalog these defects, we use the notation presented in section 3.4:

1. Ambiguous terms: an event $E$ occurred with $E \cap E_j \neq \varnothing$ and $E \nsubseteq E_j$ so one does not know if $E_j$ has occurred or not.

2. Inconsistent terms: there are two clauses $k_i, k_j$ with the feature that $E \subset E_i \cap E_j$, yet $a_i \neq a_j$. That is if event $E$ occurs, it is not clear which action $a_i$ or $a_j$ should be carried out. For example, the quantity of a good to be delivered may be ambiguous.

3. Impossible terms: for clause $k_i$ action $a_i \notin A(E_i)$, namely when event $E_i$ occurs action $a_i$ is not feasible. This is a very common case for simple contractual instruments, such as an agreement to supply $q$ at a price $p$. Events may make it impossible to supply $q$.

Each of these defects present an interpretive problem for the court. As economic models typically assume that the model parties use is an accurate representation of their relationship, these defects cannot occur. As a consequence, though there is a substantial amount of law arising from these three contractual defects, there is little economic analysis of these problems.

Even within the limits of perfectly foresighted parties, optimal interpretation requires more than simply filling gaps. Shavell (2007) formalizes interpretation as a function from the set of contractual instruments into itself. An interpretive method takes the contractual instrument – a list of pairs of events and obligations – into another list of (event, obligation) pairs.[39]

To understand the role of interpretation, we must consider the drafting options available to the parties. Consider some state $\theta$. The parties may draft a *specific* term that specifies obligations for $\theta$ only; they may draft a general term that specifies obligations for some event $E$ with $\theta \in E$, or the parties may ignore $\theta$ and leave a gap in the contractual instrument. Both gaps and general terms arise because it is costly to draft a term.

Shavell proves that the optimal method of interpretation has several properties: (1) specific terms are enforced literally; (2) gaps are filled with "majoritarian" defaults, and (3) general terms are, in some cases, overridden; the majoritarian default rule may be applied to some $\theta \in E$. These results hold for a wide class of contractual environments. There are, however, several caveats. First, there is no renegotiation. Second, there is perfect contract enforcement. Finally, the economic problem is considered in reduced form.

## 4.2  Obligation and Breach

Courts do not automatically enforce contracts, rather the party harmed by non-performance invokes the court. As such, legal enforcement is more properly viewed as providing parties with a set of decision rights. This idea has it origin in *Aghion and Bolton (1992).* They observe that bankruptcy can be viewed as a situation in which the control rights to a firm moves from the owners to the debt holders. Similarly, MacLeod (2007) observes that contract breach can be viewed as providing the harmed party the right to seek damages in a court of law.

Contract law determines the remedy available to an aggrieved party; the parties, through the contract design, assign the right to invoke the court for non-performance. We can illustrate the problem with a version of the simple buyer seller example. We also use this example to discuss remedies for contract breach.

Consider a buyer seller relationship where the seller chooses a level of effort/quality $q > 0$ that determines the probability $\lambda(q, E)$ that there has been performance as a function of $q$,

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[39]As Shavell observes, and as we noted in section 2.2 above, an interpretive method might take more than the text of the contractual instrument as its domain; the court might refer to additional texts and actions to determine the obligations of the parties.

and possibly other events $E$ that occur after $q$ is chosen (the model here is a simplified version of the model in MacLeod (2007)). Let $B_P$ be the *ex ante* benefit from performance, and $B_B$ the *ex ante* benefit if there is breach, and $c(q)$ the cost to the seller of performing $(c(0) = 0, c', c'' > 0)$. Given a price $p$, the payoffs to the buyer and seller are:

$$U_B(q) = B_P \lambda(q, E) + B_B(1 - \lambda(q, E)) - r_B - p,$$
$$U_S(q) = p - c(q) - r_S.$$

The terms $r_S, r_B \geq 0$ are the reliance expenditures by the buyer and seller. These provide the motivation for writing a contractual instrument. After the contractual instrument has been signed, but before trade and production, the buyer and seller make relationship specific investments, $r_B$ and $r_S$ respectively. As we discussed in the section on holdup, these investments provide a motivation for writing a contract.

In addition to protecting investments, the contract must also provide appropriate incentives for the seller to choose the efficient level of effort, $q^*$, given by:

$$(B_P - B_B) \lambda'(q^*, E) = c'(q^*). \tag{1}$$

Suppose that the buyer cannot directly observe effort $q$, in which case we have a model that is technically identical to a principal agent model with risk neutral agents, and hence, from a contract theory perspective, this is a trivial problem. We suppose that it is efficient to trade, and hence any state contingent price is of the form:

$$p_s = B_s - R, \ s \in \{P, B\}$$

effectively shifts all the risk to the seller, and thus induces the seller to choose the efficient level of effort. The term $R$ is the rent that the buyer obtains from the relationship. It would be set as a function of the relative *ex ante* bargaining power of the two parties.[40]

However, this contractual instrument is not a legal document - it merely specifies the transfers as a function of S's decision to perform. It supposes either a costless legal system, or a world where individuals do not breach upon their obligations. In practice there are a number of ways in which this agreement could be implemented.

There are *two* contractual instruments of simple exchange which we denote by $p^A$ and $p^P$. In the first case, $p^A$ defines the price that a buyers pays in advance in exchange for a

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[40]Under this contract we have: $U_B = R - r_B$ and $U_S = B_P \lambda(q, E) + B_B(1 - \lambda(q, E)) - R - r_S - c(q)$.

promise by the seller to deliver a good that conforms to the contract specifications. The second contract, $p^P$ is the price that the buyer promises to pay the seller upon delivery of a conforming good. Notice that neither contractual instrument is complete in the sense that neither specifies what will happen in the event of breach. Nevertheless, these contractual instruments that provide for simple exchange are very common and courts are expected to be able to adjudicate the disputes that arise in these cases.

Notice that, though these are very simple contractual instruments, they have quite different properties when viewed as resource allocation mechanisms. In the case of instrument $p^A$, the buyer has paid, and hence the performance obligation rests in the hands of the seller. If she does not perform, then the buyer must sue and must take care to collect evidence regarding the seller's performance. Thus it is the buyer who must make the investment to sue. If the seller can be shown not to perform, then the courts must determine the appropriate damages.

In the case of instrument $p^P$ the situation is reversed. In this case, once the seller has performed, the buyer must perform her promise to pay. If not, then the seller would have to sue the buyer to collect the amount due. Note that, in the second case, once performance has been verified, then the question of damages is straightforward - the buyer is obliged to pay the amount agreed upon, plus possibly any expenses arising from the delay in payment. We will use these two generic contractual instruments to discuss the various remedies for breach of contract that have been proposed by the literature.

## 4.3   Remedies for Contract Breach

### 4.3.1   Relational Contracts

Before we discuss court enforced remedies it is useful briefly to discuss relational contracts (see Malcomson (2010) for a detailed review of the literature). These contracts use the threat to terminate a relationship as a contract enforcement device. In a classic study Macaulay (1963) observed that many business relationships appear to work well, even though they have no formal contract, or the contractual instrument they have is extremely unclear/inconsistent.[41] The evidence in Macaulay (1963) suggests that parties performed because of the expectation of future business.[42]

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[41]This can occur when buyer and sellers use their own forms for purchase orders and invoice that include boiler plate terms. This leads to the famous "battle of the forms" problem in contract law. See 3.21 in Farnsworth (1999).

[42]See also Posner (1997) for a discussion of the role of *norms,* and how they may shape behavior in contractual relationships

The formal analysis of relational contracts begins with Telser (1980) who introduced the idea that a relational contract can be modeled as a repeated game. He shows that if both parties have sufficient gains from trade then, when the consequence of non-performance is a cessation of trade, they will both perform. In his model, it is assumed that both parties might breach the contract, and that this event is observable by both parties. Though Telser does not use all the formalism of repeated game theory, his analysis is consistent with the analysis of Abreu (1988).

Abreu shows that one can characterize all equilibria in a repeated game as a two step procedure. First, parties agree upon the equilibrium action in each period. In the context of a contract, this can be viewed as specifying the performance obligations. Next, Abreu shows that this "agreement" can be the outcome of playing a sub-game perfect equilibrium if, in every period, parties cannot gain by not performing, and then playing the *worst* subgame perfect equilibrium for the cheater. In other words, when breach occurs, the non-performing party faces the worst punishment possible under the rules of the game.

In this framework, the efficiency of an agreement is constrained by the size of the possible punishment. The folk theorem formalized the idea that as the frequency of interaction is increased - namely in each period there are more transactions, each of which of smaller value - then eventually the gain from cheating is less than the cost, and hence an efficient agreement can be reached. Crucially, breach can be perfectly observed. One might wonder whether the set of allocations depends upon the allocation of the cost of cheating between the two parties. MacLeod and Malcomson (1989) showed that only the total gains from future trade affect the set of feasible allocations. By carefully designing the breach obligation, combined with a bonus payment by the buyer to the seller at the end of each period, parties can choose any allocation of the surplus.

When there is uncertainty regarding performance, the problem is much more complex. This corresponds to the case for which it may not be optimal for one party always to perform, namely $\lambda(q^*, E) < 1$. In this case, it is no longer optimal for the breaching party to face the maximal penalty. The modern theory of relational contracts explores the interplay between uncertainty regarding the breach obligation, and the possible punishments available in a relationship (see MacLeod (2007) for a review). In summary, the main technical difference between the theory of damages under relational contracts and damages under contractual instruments in the shadow of the law is that the maximal punishment under a relational contract is limited. The insights of the contract design and damages literature also apply to relational contract whenever the gains from trade are sufficiently large.

Before proceeding to our discussion of damages, it is worth while discussing two papers that are often cited as examples of relational contracting, namely Klein and Leffler (1981) and Shapiro and Stiglitz (1984). These papers do not explicitly address the question of what is an optimal contract. Rather they begin with an observed contract form, and then ask what are the market implications if parties restrict themselves to this contractual instrument. In the case of Klein and Leffer (1981) they consider the simple sales contract: seller sells a good at a fixed price. They then suppose that product quality is potentially imperfect, and that the market can observe product quality in the past. They then explore the consequences for a competitive market when buyers shun sellers who have produced low quality in the past. They show that this shunning strategy implies that high quality sellers will have brand names with positive rents associated with them. Sellers will choose not to supply low quality for fear of losing the return on their brand name.

Shapiro and Stiglitz (1984) assume that firms offer fixed wage contracts, but have the ability to dismiss workers at will. When there is uncertainty regarding worker performance, or a delay in observing performance, then under such a contract employed workers must earn higher utility than newly unemployed workers (and hence there is involuntary unemployment). As MacLeod and Malcomson (1989) show, involuntary unemployment follows from the assumption on contract form, and not from the assumption of costly monitoring (see Carmichael (1989) for an excellent discussion of the issues). These papers illustrate an important branch of the literature that explores the properties of observed contractual instruments, and how features of the contractual instrument (mainly the price) vary with characteristics of the environment (see the chapter by Lafontaine and Slade (2010)). For the most part, it is still an open empirical question why some contract forms are chosen rather than others.

### 4.3.2 Specific Performance

The economics of contract for the most part assumes that the courts use the rule of *specific performance*. This rule requires the promisor (the party in default) to perform. Suppose, in our simple sales example, that the Seller fails to deliver the good. Consider specific performance in the context of the sales contract given by $p^P$ at which the buyer promises to pay $p^P$ upon delivery of the good. If Seller delivers and Buyer fails to pay, specific performance merely requires the payment of a sum of money, a task that the courts are competent to do. Notice that the first best can be achieve with a price $p^P = B_P$ whenever $\lambda(q^*, E)p^P \geq c(q^*)$.

Now consider the contractual instrument $p^A$, where the seller promises to deliver a good after payment has been made. Suppose Seller fails to deliver or delivers a good that is not of the appropriate quality. The courts cannot directly control the actions of the seller, and hence the best it can do is to provide the *incentive* for the party to perform. Edlin and Reichelstein (1996) observes that the enforcement of specific performance entails the threat of penalties that ensure that the parties perform as promised, which may entail holding one party in contempt of court.[43] If it is the case that, at the effort $q^*$, one has $\lambda(q^*, E) = 1$, then any penalty greater than $U_S(q^*) - U_S(0) = c(q^*)$ would ensure performance. As Edlin and Reichelstein (1996) observe, this makes the rule easy to implement in practice because the courts need only verify there was no performance, and then impose a sufficiently large penalty. They then provide conditions under which specific performance can ensure efficient investment and trade, significantly extending the earlier results of Rogerson (1984) and Shavell (1984).

Notice that, if parties correctly anticipate the penalty from breach, then they would never choose to breach. As contract litigation does in fact occur, for most exchanges there are likely to be events that make performance difficult to carry out, and hence in practice we should expect $\lambda(q^*, E) < 1$. In this case, a large penalty would result in the seller choosing effort that is too high. In these cases, specific performance would not achieve the first best.

The doctrine of specific performance in usually restricted to cases involving transfers of property (or other "unique" goods). Here the courts are not involved in enforcing an action, as much as enforcing an allocation of property. In other case the standard legal rule is to set damages to the expect value of the breach to the harmed party.

### 4.3.3 Expectation Damages

The rule of expectation damages attempts to measure the loss arising from breach of contract. In case of contractual instrument $p^B$, if the buyer does not pay, the loss to the seller is $p^B$, and hence, in this case, expectation damages provides the same remedy as specific performance. In the case of contract $p^A$ if the seller performs, the buyer obtain a return $B_p$, and a return of $B_B$ if there is breach. The loss due to breach would be $D = B_P - B_B$. As we can see from 1, this rule ensures that the seller has an incentive to choose effort efficiently. Crocker and Masten (1988) provides some evidence that in the case of long term gas contracts parties prefer expectation damages as a way of ensuring efficient *ex post* adaptation to changing conditions.

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[43]See Edlin and Reichelstein (1996), page 482.

The rule also provides an incentive for efficient matching. For example, suppose that the seller has another buyer of a good for whom the value is $B' > B_P$. If the seller breaches, she would have to pay the buyer $B_p$, but sell the good for $B'$, for a gain for $B' - B_P$. Thus she would breach whenever it is efficient to do so.[44] However, as Schwartz (1979) observes, this well-known argument does not necessarily imply that specific performance is inefficient. In the absence of transactions costs, the seller could always renegotiate the contract to share some of the gains from breach with the buyer.[45] In practice this argument is problematic because parties are unlikely to be truthful regarding their valuations, and hence, as discussed in section 3.2 such renegotiation is not likely to be efficient.[46]

The early literature on damage rules (Shavell (1980) and Rogerson (1984)) observed that even though expectation damages result in efficient breach, it may not provide appropriate incentives for relationship-specific investments, a theme that was later developed in the property rights approach on the theory of the firm (Grossman and Hart (1986)). In light of the subsequent literature showing that it is possible to write an efficient contractual instrument, the puzzle is why parties did not include specific terms to deal with defects? As we have discussed above, if a contractual instrument specifies monetary damages, then the setting of damages is straightforward since specific performance and expectation damages yield the same remedy for a price term - namely enforce the transfer specified in the contract.

The literature offers two distinct reasons for such incompleteness of contractual instruments. The first is that contractual instrments are *intentionally* incomplete. Shavell (1984), building on the insights of Goetz and Scott (1980), suggests that if breach is a very low probability event then parties may find that the *ex ante* cost of negotiating breach terms is greater than the benefit. In this case, they choose to delegate the damage decision to the court. In these cases they would like to court to set damages equal to the amount they would have agreed upon *ex ante*. Beginning with Townsend (1979), a literature explores the structure of optimal contractual instruments when there are costs to adding contingencies. Dye (1985) show that optimal insurance contracts will entail some pooling over events. Anderlini and Felli (1994) and Anderlini and Felli (1999) provide a theory of contract incompleteness based upon the computational cost of describing an event. Battigalli and Maggi (2002) extend this work and discuss how contract complexity affect the choice of contract terms -

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[44]See Hermalin et al. (2006), section 5.2 for discussion of this well known result as well as a more comprehensive review of the literature on expectation damages, and related measures of damages.

[45]Alternatively, the second buyer could purchase from the original buyer.

[46]See Ayres and Talley (1995) for a beautiful study of how the choice of default rule can affect the efficiency of renegotiation when there is asymmetric information.

whether they are rigid or flexible.

A number of papers show that parties may strategically choose incomplete contractual instruments. Ayres and Gertner (1989), Aghion and Hermalin (1990) and Spier (1992) show that a buyer may not work to add a terms for damages fearing that it will reveal how much he values the good. The seller could use this information to increase the price. Hermalin and Katz (1993) suggest that courts should allow parties to use "fill in the blank" contractual instruments to enhance performance.

Bernheim and Whinston (1998) show that that parties may choose to leave contractual instruments incomplete because this will increase the future gains from trade, and thus increase the set of outcomes that can be supported by a subgame perfect equilibria. This allows the parties to place more reliance upon the value of a future relationship for enforcement, and thereby avoid costly enforement via a court. Scott (2003) provides some evidence from case law that is consistent with the results of Bernheim and Whinston (1998), namely parties do seem use contract incompleteness to enhance the set of feasible allocations. Baker et al. (1994) have what can be viewed as a countervailing result. Namely, they show that if one adds some legally binding performance clauses then this can increase the set of self-enforcing agreements. Schmidt and Schnitzer (1995) provide an interesting result. Namely, when one party breaches a relational contract, then, rather than separate, the parties might choose to use a contractual instrument that is enforceable in court. This would reduce the cost from breaching and thereby reduce the set of contracts enforceable with a relational contract. See MacLeod (2007) for further discussion of these points.

Before proceeding to the next section, it is worthwhile discussing the role that liquidated damages play. Under contractual instrument $p^A$ the seller promises to perform, otherwise there is a breach of contract. Agency theory would predict that in this case parties would use a contingent contract - namely a price if there is performance, and if there is there is non-performance the seller would pay to the buyer a penalty $B_P - B_B$ that would ensure efficient effort. Under such a contractual instrument, the delivery of non-conforming goods would not be a breach of contract, but rather it would be the non-payment of the penalty that would result in a breach of contract. In this case, whether one uses specific performance or expectation damages as the default rule, the remedy for breach (non-payment) would be simply the requirement that the penalty be paid.

In the economics literature, this is sometimes interpreted to mean that parties have specified *liquidated damages* - the amount that the seller should pay if there is non-performance. However, these are two quite different contractual instruments. A liquidated damages clause

specifies a payment by the seller *if* there is breach - if the seller supplies the non-performing goods the buyer could sue in court for the amount specified by the liquidated damages. The court can, if it chooses, use the liquidated damage clause to assess damages. However, it not *required* to do this. If the court feels that damages are excessive, it can reduce them or not impose any at all. To many commentators, the discretion allowed to the courts is excessive. Note that parties might choose liquidated damages over a two part tariff precisely because the court can use information that was not known or foreseen at the time the parties signed their contractual instrument.

The penalty doctrine allows courts to reduce or waive liquidated damages that they feel are excessive.[47] This rule can be used to explain some features of observed contractual instruments. A good example of this are long term contracts for inputs to a manufacturing process. Joskow (1988) describes in some detail the market for the supply of coal to electric utilities. If parties are risk neutral, then in principle they could agree to terms that might allow the contract price for coal to vary significantly from the spot price. An interesting feature of observed contract prices is that they closely follow the spot price for coal. This raises the question of why don't parties use the spot price, rather than engage in costly contract design? MacLeod and Malcomson (1993) provide a solution to this problem. As we discussed above, if each party needs to make a relationship specific investment that affects their own payoffs, but not the other's (the so called self investment case), then it is efficient to have a fixed price contract. However, over time the price of coal can fluctuate a great deal. Parties could put into place large penalties to enforce trade at the contract price, but these may not be enforceable under the penalty doctrine. MacLeod and Malcomson (1993) show that if parties can index the contractual instruments so that it follows the market price, then it is unnecessary to put into place penalties for breach of contract, and moreover parties would still have the incentive to make efficient investments into relationship specific capital because their investments do not affect the price paid or received in the future.

### 4.3.4 Unforeseen Events

The evaluation of different legal rules in the face of unforeseen events is challenging because it is not clear how one should model such events. In the models of incomplete contracts discussed above the parties perceived all the possible future events, but found it too costly to incorporate these events into a formal contract.

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[47]See Posner and Rosenfield (1977) for an early analysis of these issues.

Bajari and Tadelis (2001) introduce a simple and elegant way to formally introduce unforeseen events into a model of construction contracts. The idea is that the time and money spent drafting a contract can be viewed as *relationship specific investment* into the quality of the contractual instrument. Let $I$ be the investment into planning, and let $\rho(I)$ be the probability that only foreseen events occur. It is assumed that $\rho' > 0$, and hence the quality of planning increases with $I$. With probability $1 - \rho(I)$ an unforeseen event occurs. They then compare two contract forms - fixed price and cost plus. Under a fixed price contract the seller is responsible for delivering an acceptable product at the agreed upon price. This implies that the seller receives all the returns from any cost saving actions.

In contrast, under a cost plus contract, the buyer pays all costs of production, thereby reducing the incentives to the seller of making unobserved cost-reducing investments. If all events are foreseeable, then the fixed price contract implements the first-best, while if no event is foreseeable, then the cost plus contract is more efficient. Thus, if the cost of planning are sufficiently low that unforeseen events occur with low probability, then a fixed price contract is optimal, and vice versa with respect to cost plus contracts. The model delivers a theory of contract form as a function of the complexity of the environment, as measured by the cost of planning.

Tirole (2009) interprets the cost of planning as a form of limited cognition, and then explores the consequence of planning costs/limited cognition upon contract design. He shows that given that one can hide one's information, then the introduction of limited cognition can lead to adverse selection, as in the model of Spier (1992). Second, he showed that contractual instruments may be too complete and that parties focus upon adding terms that protect them from adverse consequences. He also shows that *ex ante* competition need not reduce transactions costs. In summary, this paper explores how planning costs and limited cognition constrain the optimal contract. Both of these papers follow the norms of agency theory and do not introduce law an a potential constraint.

This question is addressed in Chakravarty and MacLeod (2009). They begin with the structure of the American Institute of Architects form construction contracts. This class of contractual instruments is interesting because they are widely used in the US construction industry, and have evolved over 100 years in response to both experience in the field and the outcome of litigation involving construction disputes. Hence these contractual instruments are likely to satisfy the economists' assumption that the form of observed contractual instruments can be explained as an efficient to solution to the problem of implementing trade given transactions costs and the characteristics of the contracting parties. Chakravarty and

MacLeod (2009) show that these contracts can indeed be viewed as efficient under the following conditions:

1. The buyer's design is costly in the sense of Bajari and Tadelis (2001).

2. The seller's investment in cost reduction is not observable, though realized costs are observable.

3. Buyer's preferences are private information, and they can change between the time of contract and project implementation.

4. Courts use expectation damages, but may excuse performance.

In practice construction must occur in the shadow of the law, and it is natural to ask if efficient trade is possible within existing law. The literature on mechanism design reviewed above suggests that specific performance may be a necessary ingredient for efficient trade. Chakravarty and MacLeod (2009) find that this is not the case - these contractual instruments are able to implement the efficient allocation with a generalized version of expectation damages:

$$Damages = Foreseeability \times Expectation,$$

where *Foreseeability* is a number between 0 (unforeseen) and 1 (perfectly foreseen) representing the extent to which a lost is anticipated. If an event is unforeeseable, and/or impractical, then the law excuses the breaching party from performance. On the other hand, if the event is foreseen, then the rule of expectation damages applies. Both of these extremes are consistent with current law. The rule is more general because, when an event is only partially foreseeable, then damages should be reduced. This rule is implemented in the AIA forms by leaving the damages in some cases to be determined by mutual consent.

One of the more interesting features of the AIA contract is the extensive use made of delegation. For example, the buyer has full control over *ex post* characteristics of the building. For example, suppose that the contract calls for the painting of a house blue, but at a later point the buyer decides that she really hates blue, and would like a white house. Models of incomplete contractual instruments, such as Hart and Moore (1988) and Aghion et al. (1994), suppose that the default during renegotiation is a blue house. Namely, if renegotiation failed, then the contractual instrument would result in a blue house. This default would allow the seller to extract a fraction of the difference in value between a white and blue house. In contrast, under the AIA contract (and in fact under the US common law) should the buyer tell the seller to paint the house white the seller has an *obligation* to

use white paint. At the point the only obligation to the buyer is to compensated the seller for any out of pocket costs resulting from the change in contract terms.

In construction it is common, if not ubiquitous, for there to be changes in plans after a contract has been signed. The AIA form contracts address the problem by allowing the buyer to create new obligations *ex post.* The next section address this issue in more detail.

## 4.4   Authority: Creating an obligation ex post

Lafontaine and Slade (2010) observe that it is very common for contractual instruments to include an allocation of control rights or authority. In this section, we discuss some of the literature that explores the reason for such a contractual instrument.  There will be essentially three reasons for the allocation of authority to one party or another, namely unforeseen or costly to foresee contingencies, asymmetric information and the allocation of *ex post* bargaining power.

The first formal model of authority, indeed the first modern contract model, is due to Simon (1951).[48] He considered a model in which parties sign a contractual instrument, the buyer learns the state of nature, and then the level of output that the seller is to provide the buyer is determined. Formally the optimal allocation $\{q(x), p\}$ solves:

$$max_{\{q(x),p\}} \quad E\{B(x, q(x))\} - p$$
$$subject\,to:$$
$$p - E\{C(q(x))\} \geq u^0$$

where $x$ is a random variable, $c(q)$ is the cost of producing $q$, $B(x, q)$ the benefit of $q$ in state $x$, $p$ is the price and $u^0$ is the sellers outside option. Simon (1951) supposes that $x$ is not contractible and known only to the buyer. Hence, the buyer is constrained to choose between two contractual instruments. The first is a *sales contrac*t where price $p$ and quantity $q$ are set in advance. The second is an *employment contract.* This is a contractlual instrument in which the seller (employee) agrees to supply any amount in a set $Q$ at a price $p$. The benefit of this contractual instrument is that the buyer can adjust $q$ as a function of information received after the contractual instrument is signed. Here Simon has in mind an elemental theory of bounded rationality that is captured by the hypothesis that $x$ cannot be explicitly contracted upon - a theme that the profession would not explore again until the 1980s. The

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[48]In this section the focus is upon contractual instruments with authority. Notions of authority and control are also central to the theory of the firm - see Gibbons (2005).

main result is that when uncertainty is sufficiently important (variance of $x$ sufficiently large) then the employment contract is most efficient, otherwise parties will use a sales contract.

In terms of enforcement, notice that the employment contract has two elements. First, the buyer, after observing $x$, creates a performance obligation, $q(x)$ for the seller. If the seller does not perform, then the seller has breached. In employment relationships, such breach does not typically lead to damages, but to the dismissal of the employee. Thus, the employment contract is enforceable only to the extent that dismissal is a sufficiently large penalty. A second element to the contractual instrument, namely the requirement that $q(x) \in Q$, might be enforced by requiring that the seller can only be dismissed with just cause. If the employer asks for an action outside of the set $Q$, then the seller has a right to refuse to carry out such actions.

An obvious application of the model is to the theory of the firm - namely a theory that predicts when contracts are within the firm and when they are between firms. Alchian and Demsetz (1972) argued that Simon's employment contract could not be construed as an explanation for why we have firms. They observed that the buyer and seller are free to reach any agreement they wish, and should circumstances change the contract terms can be renegotiated. Thus, as MacLeod (2002a) shows formally, the introduction of renegotiation ensures that Simon's sales contract can always achieve the first best. This result suggests that, for a complete model of authority, one needs to add an additional ingredient. One such ingredient is asymmetric information.

There are two ways in which asymmetric information may lead to an allocation of authority rights. The first of these has its roots in Williamson (1975)'s idea that contractual relations are plagued by *ex post* opportunistic behavior that leads to costly contract renegotiation. These costs are formally captured in the Myerson and Satterthwaite (1983) model. If there is two sided asymmetric information, and one is not sure if it is efficient to trade, then it is not possible to implement the efficient allocation. A corollary of this result is that, if there is *one-side* asymmetric information, then it is possible to achieve an *efficient* allocation. This point is reflected in standard construction contracts. They place an obligation upon the seller to keep track of costs. This obligation makes sense because it is much easier to measure costs than it is to measures a buyer's valuation of a design trade. Chakravarty and MacLeod (2009) note that this observation is consistent with the standard clauses in AIA form contracts that allocate authority for design changes to the buyer, while requiring the buyer to compensate the seller for any *measured* out of pocket costs arising from the change. This rule ensures that all efficient changes are implemented *ex post*.

Aghion and Tirole (1997) introduce an innovative model of the authority relationship that extends this theme. Their idea is that authority arises from the access to information necessary to act. In their model, the principal with formal authority will delegate authority to an agent who has better information. However, they will reserve the right to overrule an agent when they are better informed. This model can be viewed as another way of explaining employment contracts. The law gives the employer broad discretion when allocating tasks to the employee, and the employer always has the formal right to change an employee's task as long as it is within the scope of work.

Finally, the allocation of authority also affects the allocation of bargaining during contract renegotiation that can occur when contractual instruments are incomplete and there is the potential for holdup. Grossman and Hart (1986) use this idea to develop a theory of property rights. On their account, ownership in practice means the allocation of authority over any action entailing the use of property that is not constraint by any contractual obligations. Several papers have extended this idea to the realm of legally binding contracts. Elfenbein and Lerner (2003) find that contract terms between internet portals and other firms during the 1995-1999 period can be explained as a response to the problem of holdup. Kaplan and Stromberg (2003) similarly show that venture capital financing contracts appear to solve a holdup problem. Both papers explore the choice of contractual instruments under the hypothesis that they are enforceable, and hence leave open the question of how courts would interpret such contractual instruments.

Finally, there is some work that studies the structure of hybrid contractual instruments that deal with a number of transcations costs. Blair and Lafontaine (2005) provide a comprehensive review of both the economics and the law of franchising. This work describes the enforceability of different franchise clauses, though it leaves open the question of *why* the law has a particular structure. The work of Arrunada et al. (2001) provides a rich analysis of contract terms for car dealers in Spain, and show that these contractual instruments are complex hybrid designed to deal with a number of transactions costs. It would be interesting to know to what extent the principles of contract design apply in different legal jurisdictions.

# 5  Concluding Discussion: Economics, Law and Practice

A theory of contracts studies the relation among four theoretical objects: contractual environments, contractual instruments, contract law, and contractual behavior. The relation among these concepts is complex. In the short term, the contractual environment and

contract law are exogenous; we thus seek to explain both contractual instruments and the resulting contractual behavior in terms of the exogenously given contractual environment and contract law. From a wider perpsective, however, both contract law and, to a lesser extent, the contractual environment are endogenous. To a large extent, we choose the legal rules that govern contractual instruments. Similarly, agents choose the environment in which they contract; moreover they might act to alter the contractual environment in which they find themselves.

Each aspect of the literature on contract focuses on a different explanatory question. The mechanism design literature asks: for a given contractual environment, does a mechanism exist that induces efficient contractual behavior? In this literature, a mechanism conflates contractual instruments and contract law; it examines *contracts*, the set of obligations that result from the operation of contract law on contractual instruments Nevertheless, the literature assumes a legal system that is basically utopian.

The incomplete contracts literature, by contrast, seeks to explain the structure of observed contractual instruments. It often begins with some observed contract form and then asks: in what contractual environment is a specified contractual instrument optimal for the parties? Once again, the structure and competence of the legal system is largely idealized. The incomplete contracts literature explains the oddities of contractual instruments largely without reference to any features of contract law.

The literature on the economic analysis of contract law, finally, abandons the assumption of an ideal legal system. Rather, it often asks: given a contractual instrument within a specific contractual environment, how does the legal rule influence contractual behavior? Here, the legal system is not ideal though the literature has primarily relaxed only the assumption of perfect enforcement.

Each of these literatures has provided significant insight into contractual behavior and the structure of contractual instruments. The mechanism design literature, for instance, has provided clear, formal accounts of specific "transaction costs" such as asymmetric information and analyzed the extent to which these features of the contractual environment impede efficient exchange. The assumption of an ideal legal system, however, limits the practical insights available from these models. An assumption of perfect enforcement, for example, implies that contractual behavior always conforms to the obligations embodied in the contractual instrument. Indeed, rational parties need never invoke an ideal legal system; the shadow of the law is sufficient to regulate behavior. Similarly, the assumption that interpretation is unambiguous, clear and foreseeable implies that parties can always implement

perfectly their intentions.

The economic analysis of contract law adopts complementary simplifying assumptions. It generally studies very simple contractual environments; we have little idea how the ideal legal rule would vary across contractual environments. Similarly, it generally focuses on the effects of legal rules on contractual behavior but ignores the effects of legal rules on contractual instruments. It has provided few explanations for variation in available remedies across contractual environments and contractual instruments. Why, for instance, are common law employment contracts at-will rather than protected by expectation damages? Moreover, the formal study of interpretation is in its infancy. Models have very crude representations of the the rules of interpretation in part because the literature has not exploited the language formulated in Battigalli and Maggi (2002).

This caricatured sketch of these literatures points clearly to promising paths of future research. We need to meld the sophisticated analyses of contractual environments and contractual instruments to the simple models of non-ideal legal institutions. The mechanism design literature might investigate the set of achievable allocations under non-ideal legal systems. Imperfect enforcement will impede the realziation of first-best allocations. How good must contract enforcement be to yield the first-best? How costly is imperfect enforcement?

Relaxing the assumption of unambiguous interpretation is apt to be both more difficult and more fruitful. Contracting agents rarely use new or innovative language in their contractual instruments. Contractual terms that have been subject to extensive interpretation provide a more certain environment against which to contract. This observation that many contractual terms might be sub-optimal relative to the world in which interpretation is unambiguous and costless. Thus, at least some features of observed contracts, likely respond to the failings of the courts and contract law.

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