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The Effect of Bargaining Power on Contract Design

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Abstract

Over the past 40 years, an irrelevance proposition has been prevalent in law-and-economics scholarship: bargaining power should affect only price and not non-price terms of a contract. In contrast, practitioners and commentators in industry regularly invoke bargaining power to explain static and dynamic variance in non-price contract terms. This paper unpacks and analyzes the assumptions of the strong- and weak-versions of this bargaining power irrelevance proposition, to bridge the gap between theory and the real world. In the first half of the paper, we identify and discuss a variety of explanations for the effect of bargaining power on contract design, under conditions of information asymmetry and positive transaction costs. These include the effects of shifts in market supply and demand and the effect of bargaining through lawyers. In the second half of the paper, we present an in-depth examination of one set of explanations, concerning the impact of bargaining power and information asymmetry on non-price terms, when the value and cost of non-price terms vary across contracting parties. In the extreme cases in which one or the other party enjoys overwhelming bargaining power, the efforts of that party to capture a larger share of the surplus by screening or signaling may compromise the efficiency of the non-price terms. We show that this incentive disappears or is mitigated when bargaining power is more evenly shared between the parties: for example, when a monopolist faces the threat of competition, when the parties can renegotiate, or when they engage in bilateral bargaining with more even bargaining power. As a whole, the paper provides a theoretical basis for interpreting the intuition among market participants that the impact of bargaining power extends beyond price terms. Before concluding, we briefly suggest implications for legal policy, particularly the contract law doctrine of unconscionability.

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Introduction

When two parties enter into a contract, their relative bargaining power affects the terms of their deal. While the allocation of bargaining power clearly determines price, it is an open question whether and how it also affects non-price terms (what we are alternatively referring to as “contract design”). It is common for practitioners and industry observers to attribute seemingly one-sided non-price terms to unequal bargaining power and to explain changes in non-price terms over time as a result of shifts in such power. Consider the following examples of such observations:

1. Disclaimers of warranties and limitations on damages in a sales contract are due to the power of the monopolist.
2. Broad termination rights are included in a merger or acquisition agreement when the acquirer has the power to dictate the terms of the agreement to the target company.
3. The purchase order forms of a large corporation, facing many potential suppliers, insist that all litigation will be held in the courts of the purchaser’s state.

The objective of this paper is to begin a systematic analysis of how bargaining power might determine the agreement to such apparently one-sided terms. An important normative question is whether the efforts of the stronger party to appropriate a larger share of the surplus through these terms compromise the size of the surplus. Would a more equal sharing of bargaining power be more likely to lead to efficient (surplus-maximizing) contract provisions?

In legal scholarship, the issues of one-sided contract terms bear on the antitrust regulation of monopolies, as well as the policing of contracts under the doctrine of unconscionability. Early legal scholarship maintained that monopolists often used contracts of adhesion that contain one-sided terms.¹ Law-and-economics scholars argued in response that bargaining power affects price, but not other terms.² The basic argument can be found in an early work by Richard Posner, who argued that a profit-maximizing monopolist would offer product quality that efficiently meets buyer preferences, i.e., increasing quality until the incremental cost of further increase outweighs the incremental value to the buyer. Thus, a monopolist producer of cars should find it in its self-interest to offer any warranty for which the buyer is willing to pay more than the cost to the producer, just as if it were a seller in a competitive market. The difference between a monopoly and a perfectly competitive market, then, should be the market price, not the warranty terms offered. The argument that a monopolist extracts its rent through price rather than quality continues to be the conventional wisdom among the leading scholars in law-and-economics to the present.³

¹ Friedrich Kessler, *Contracts of Adhesion—Some Thoughts About Freedom of Contracts*, 43 Colum. L. Rev. 629 (1943). The high-water mark in judicial doctrine may have been *Henningsen v. Bloomfield Motors*, 32 N.J. 358 (1960).

² Distinction between price and non-price terms, as used in the literature, is often unclear. See *infra* --.

³ In Part II.A., we identify two versions of this conventional wisdom as irrelevance propositions. First, the strong-form version stands for the proposition that bargaining power only affects price and has no effect on non-price terms. Second, in the weak-form version, bargaining power may affect non-price terms, but the parties are no more likely to agree to inefficient non-price terms under unequal, than equal bargaining power. Various statements of the conventional wisdom are found in Richard Epstein, *Unconscionability: A Critical Reappraisal*, 18 J. L. Econ. 293

Empirical literature on the relationship between bargaining power and non-price terms, such as warranties, is thin but mixed.⁴ Recently, in a study of terms in end user licensing agreements (EULAs), Marotta-Wurgler found no evidence to support the hypothesis that market concentration causes terms to be more seller-friendly than in competitive markets.⁵ The study suggests, therefore, that market power alone should not be sufficient to trigger the scrutiny of a court under the doctrine of unconscionability.⁶ In contrast, Ben-Shahar and White examined auto-manufacturer supply contracts and found variations in non-price terms, such as warranty and termination provisions, that seemed correlated with bargaining power.⁷ While reading and search costs may be a confounding factor in consumer standard-form contracts, such as the EULAs in Marotta-Wurgler's study, Ben-Shahar and White's sample is pertinent to our analysis because it contains business-to-business contracts where this factor is less likely or unlikely to be an issue. In light of the conventional wisdom in law-and-economics, Ben-Shahar and White were surprised by their observation of variation and inefficiency, remarking that "[g]iven the enormous stakes, we expected that economic power would be used to dictate low prices, not selfish boilerplate."⁸ They speculated that the variation and the potential inefficiency was due to

(1975); Alan Schwartz, *A Re-Examination of Nonsubstantive Unconscionability*, 63 Va. L. Rev. 1053, 1071-6 (1977) ("Given... three [weak] assumptions, a firm will produce the same level of product quality regardless of whether the firm is a monopolist or a perfect competitor"); George L. Priest, *A Theory of the Consumer Product Warranty*, 90 Yale L.J. 1297, 1320-21 (1981); Alan Schwartz and Louis L. Wilde, *Product Quality and Imperfect Information*, 52 Rev. Econ. Stud. 251 (1985) (where consumers are imperfectly informed about product prices and quality levels offered by the various sellers (i.e. positive search costs), and where there are low fixed costs to providing quality, a profit maximizing seller will offer at least the optimal quality, but at a supra-competitive price); Richard Craswell, *Property Rules and Liability Rules in Unconscionability and Related Doctrines*, 60 U. Chi. L. Rev. 1, 39-40 (1993) ("monopolist's incentives is normally to offer the most attractive non-price terms she can think of, the better to gouge her customers by charging them a higher price"); Alan Schwartz and Robert E. Scott, *Contract Theory and the Limits of Contract Law*, 113 Yale L.J. 541, 552-4 (2003) ("Bargaining power instead is exercised in the division of the surplus, which is determined by the price term. Parties jointly choose the contract terms so as to maximize the surplus, which the parties may then divide unequally"); Douglas Baird, *The Boilerplate Puzzle*, 104 Mich. L. Rev. 933 (2006); Robert E. Scott and Jody S. Kraus, *CONTRACT LAW AND THEORY* 58-60 (4th ed. 2007). Two noteworthy contracts articles analyze the effect of bargaining power on the likelihood that imperfectly informed parties will contract successfully around inefficient contract law defaults. See Jason Scott Johnston, *Strategic Bargaining and the Economic Theory of Contract Default Rules*, 100 Yale L.J. 615 (1990); and Ian Ayres and Robert Gertner, *Strategic Contractual Inefficiency and the Optimal Choice of Legal Rules*, 101 Yale L.J. 729 (1992). We discuss these at infra notes --.

⁴ E.g., George G. Bogert & E.E. Fink, *Business Practice Regarding Warranties in the Sale of Goods*, 25 Ill. L. Rev. 400 (1930); William C. Whitford, *Law and the Consumer Transaction: A Case Study of the Automobile Warranty*, Wis. L. Rev. 1006, 1062 (1968) ; George L. Priest, *A Theory of the Consumer Product Warranty*, 90 Yale L.J. 1297, 1320-1 (1981)(no relationship between industry concentration and warranty coverage); Florencia Marotta-Wurgler, *Competition and the Quality of Standard Form Contracts: The Case of Software License Agreements*, 5 J. Empirical Legal Stud. 447 (2008); Antonio Cabrales, Gary Charness and Marie Claire Villeval, *Hidden information, bargaining power, and efficiency: an experiment*, 14 Exp. Econ. 133 (2011) (experimental results showing that more efficient terms are chosen in principal-agent bargains when either there are multiple principals or multiple agents).

⁵ Marotta-Wurgler does find the expected positive relationship between price and market share or industry concentration. *Supra* note --, at 451.

⁶ *Id.* At 475.

⁷ Omri Ben-Shahar and James J. White, *Boilerplate and Economic Power in Auto Manufacturing Contracts*, 104 Mich. L. Rev. 953, 971 (2006) (observing, for example, that original equipment manufacturers exert their power to extract broad warranties, discretion over quantity, and rights to terminate without cause, while giving their suppliers little if any corresponding right to cancel).

⁸ *Id.*, at 964.

internal agency conflicts within the parties, but conceded that “we do not offer a satisfactory explanation for the variance of terms across the different original equipment manufacturer (OEM) contracts, or for the conjecture that some of these terms are inefficient.”⁹

The puzzle that Ben-Shahar and White raise is echoed repeatedly by practitioners and commentators in the business and legal press, who invoke bargaining power to explain both static and dynamic observations of contracting patterns. One static observation is that business entities that dominate their industries tend to adopt different contractual allocations of similar risks depending on whether they are buyers or sellers. When they are buyers or licensees, they demand extensive warranties and indemnification promises from their counterparts; when they are sellers or licensors, they disclaim, limit remedies and demand indemnification from their customers. A dynamic observation is that contract terms such as covenants in loan and debt agreements or material adverse change (MAC) clauses in mergers and acquisitions agreements, fluctuate over time between “buyer-friendly” and “seller-friendly” versions as market conditions change.¹⁰

When and why bargaining or market power is a determinant of non-price terms, therefore, remains an open question worthy of investigation. The conventional law-and-economics theory offers a starting point for this analysis by offering two irrelevance propositions: (1) bargaining power affects price but not the non-price terms of a contract (the strong-form version) and (2) the allocation of bargaining power may lead to different non-price terms but does not change the likelihood that the parties will agree to efficient terms (the weak-form version).¹¹ Each of these propositions depends on a set of implicit assumptions, including perfect information and zero transactions costs. We relax these assumptions in this paper to analyze the effect of bargaining power on contract design.

There is no single definition of bargaining power and this is a source of considerable confusion. At various times, the expression is used to refer to at least five different conditions: excess demand or supply, market concentration, information advantages, the capacity to be more patient or less risk averse in bargaining, or superior negotiating skill. In Part I, we disentangle these meanings, assuming throughout that the parties are sufficiently sophisticated so as to understand all the terms of their agreement.

Given our assumption that the parties understand the terms of their agreement, it follows that the agreement creates a surplus and no party is worse off with the agreement than without it. By any definition, bargaining power has a distributional effect on the parties’ respective payoffs from their exchange. As unpacked in Part II.A., the strong-form irrelevance proposition implicitly divides contract terms into two categories: (1) non-price terms, such as warranties and termination rights, that contribute to the size of the surplus;¹² and (2) price terms that only

⁹ Id., at 982.

¹⁰ See notes – and accompanying text (in Part II.B and II.D)

¹¹ See notes – and accompanying text (in Part II.A)

¹²The distinction between price and non-price terms can be confusing because non-price terms allocate surplus as well. Conditional on price, limited warranty will both decrease the buyer’s surplus and increase the seller’s profit. In addition, many non-price terms, such as warranty and collateral clauses, often look like price terms in the sense that they stipulate a “price” that the promisor has to “pay” to the promisee on the occurrence of an event (or a condition).

allocate the surplus and have no effect on its size. However, variations in price terms can affect the surplus by changing, for example, the types of parties who are drawn to the deal and their behavior incentives.¹³ Indeed, these effects in turn can alter the optimal design of the non-price terms. In Part II.B., we suggest that, through its effect on the price term, bargaining power might change the optimal non-price terms when the change in price (1) alters one (or both) party's rate of substitution between price and non-price terms; and (1) affects the severity of the adverse selection or moral hazard problems.

These effects challenge the strong-form of the irrelevance proposition but are consistent with the weak-form: although the non-price terms change, the parties would still agree to maximize their surplus. In Part II.C., we outline three ways in which the shift in the bargaining power might lead to a deviation from efficient contract design: (1) greater or lesser bargaining power may affect the incentives of either party to invest effort and resources in innovating and developing contractual opportunities to create value; (2) it might exacerbate the inclination of negotiators to engage in value-claiming rather than value-creating strategies; and (3) in negotiations characterized by information asymmetry, unequal bargaining power might encourage excessive signaling or screening activity. We explore this last explanation more thoroughly in Parts IV and V, showing that a more even balance in power can reduce the screening or signaling inefficiency. Before concluding Part II, we briefly introduce a more complicated question of how bargaining power influences contract design when negotiations are conducted through agents and in stages. Business contracting often occurs in a two-stage process: the price and selected other important terms are decided by the business principals, and the design "details" are delegated to their respective lawyers.

Part III reviews the theoretical works in the economics of industrial organization that analyze the efficiency of the product quality offered under two polar market conditions: monopoly and perfect competition. The literature has shown that a monopolist may offer suboptimal quality under at least two important scenarios. If the monopolist were to offer identical quality to all buyers (due, for instance, to its inability to prevent resale or arbitrage), it will determine the quality based on the preferences (for quality) of the marginal, rather than the average, buyer, thereby offer inefficient quality to the other buyers.¹⁴ If the monopolist were to discriminate among buyers of heterogeneous preferences by offering a menu of quality options without observing individual buyer's preferences, the monopolist will strategically offer inefficiently low quality to a subset of buyers: the monopolist will engage in "inefficient screening".

The literature has also shown that a perfectly competitive market may also offer inefficient quality to consumers. When sellers in a perfectly competitive market do not observe buyers' heterogeneous preferences and when such preferences also affect the cost of providing quality, competition will lead sellers to "cream skim" a subset of buyers (or buyers to "inefficiently signal" their types) by offering suboptimal quality. Safety features of a product can serve as a

¹³ A higher or lower price can attract different parties (with different potential surplus) to a contract (adverse selection) or, in case the contract stipulates a payment in the future, affect the contracting party's post-contractual behavior (moral hazard). See the discussion of debt covenants in part II.B. and accompanying notes for a more in-depth analysis of this issue.

¹⁴ In contrast, social planner that maximizes social welfare will set the quality by equating the marginal cost with the marginal value to the *average* buyer. Under certain conditions, the welfare-maximizing equilibrium can be replicated in a perfect competition.

useful example. Even if it is optimal for all consumers to obtain full safety features on a product, if the market were to offer full safety features at a single price, less accident-prone consumers would be subsidizing the more accident-prone ones. Sellers then would attempt to attract less accident-prone consumers by offering product with suboptimal safety features at a lower price.¹⁵

In Part IV, we present a simple example of negotiation between a buyer and a seller, where the buyer knows how much she is willing to pay for a non-price term but the seller does not. Consistent with the results from the industrial organizations literature, we demonstrate that one-sided bargaining power leads to an inefficient agreement. When the seller has all the bargaining power, the seller, just like a monopolist, will engage in inefficient screening to differentiate buyer types, and provide suboptimal non-price term to the buyer type who values the non-price term less. At the other extreme, when the buyer has all the bargaining power, similar to the case of perfect competition, certain buyer type will attempt to avoid subsidizing other buyer types by deliberately offering suboptimal non-price terms and, thereby, successfully signaling her type to the seller.¹⁶ We make several assumptions that are plausible across a significant domain of non-price terms, including: (1) contract rights are generally non-assignable, even if the underlying product can be resold; (2) a buyer's idiosyncratic preference affects not only the value of non-price terms to the buyer, but also the cost to the seller; and (3) unlike physical attributes of a product, contract terms are easier to vary from one consumer to another and also to modify, even after sale.¹⁷

If we were to use automobile warranty with two types of buyers (careful versus careless drivers) as an example, even though both types of buyers prefer to get an extended warranty for their cars, when the market is served by a single manufacturer, the monopolist will screen buyer types by offering both extended and limited warranties so as to grab a larger fraction of the surplus from each buyer. Conversely, when the market is perfectly competitive, if the market were to offer extended warranty to all buyers at a single price, careful drivers would be subsidizing the careless drivers. The careful drivers, then, would have an incentive to choose limited warranty so as to signal their type to the market (or the sellers would cream skim the careful drivers with limited warranty) and receive a price reduction that exceeds the value of the foregone warranty.

The problem of extreme allocations of bargaining power in either direction stems, in part, from the fact that one party has the power to dictate the terms of trade. The party with this power is

¹⁵ This argument is familiar in markets for health insurance, and can be applied more broadly to contracting patterns in other industries. When both the healthy and sick people are pooled together for a common insurance, the healthy will be subsidizing the sick, and they will have an incentive to drop out of the common policy by, for instance, choosing less than full insurance but at a much lower premium. See, e.g., Michael Rothschild and Joseph Stiglitz, *Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information*, 90 Q.J. Econ 629 (1976) and Albert Choi and Kathy Spier, *Should Consumers be Permitted to Waive Products Liability? Product Safety, Private Contracts, and Adverse Selection*, University of Virginia Law School Working Paper (2011).

¹⁶ This problem is similar to that of inefficient excessive signaling. See Philippe Aghion and Benjamin Hermalin, *Legal Restrictions on Private Contracts Can Enhance Efficiency*, 6 J L Econ & Org 381 (1990).

¹⁷ The value and the cost of a product warranty, for instance, depend on the use of the product by the buyer; both value and cost of more restrictive termination rights depends on the circumstances of the target company; and the value and cost of restrictions on venue choice depends on the likelihood of a dispute with that particular seller. The cost of other types of terms may be much less affected by buyer type, such as a clause that stipulates damages. See Ayres, *supra* note – (showing that competitive market leads to efficient contracting around default liquidated damages provision).

willing, in many circumstances, to sacrifice some of the aggregate surplus in order to capture a larger share of the surplus. When the seller has all the bargaining power, for instance, any surplus the buyer captures (due to the buyer's superior knowledge about her willingness-to-pay) becomes an opportunity cost for the seller. Seeking to reduce the buyer's surplus, the seller offers inefficient non-price terms. When the buyer has all the bargaining power, on the other hand, any (indirect) subsidy one group of buyers supplies to another is an opportunity cost for the subsidizers. The subsidizing buyers can reduce or eliminate that subsidy by signaling their type with inefficient non-price terms.

Part V demonstrates that a more "even" sharing of bargaining power can address these inefficiencies in contract design. The circumstances that would balance bargaining power in this respect are not obvious. After all, competitive markets essentially allocate all the power to the buyers without leaving any surplus for the sellers. We suggest three ways of representing more "even" sharing of bargaining power. In the first, some competition is introduced by allowing another seller (an entrant) to compete with an existing seller (an incumbent). In the second, the power of commitment is reduced by letting the contracting parties to renegotiate the original contract. In the third, the seller's power to dictate the terms is curtailed by allowing the buyer to make a counter-offer with some delay. In each of these cases, we demonstrate the key result that the conditions mitigate or eliminate the inefficiencies of screening and signaling through non-price terms. The Appendix presents a more general model in which a social planner (mechanism designer) can choose, without knowing buyer type, what types of contract to offer to the buyer and the seller.

Our purpose in this paper is predominantly to provide a theoretical framework for understanding the real-world observation that bargaining power determines contract design. Along the way, we comment on the efficiency of the outcomes under different power allocations and this naturally leads to the question of the role of the law in correcting bargaining or market inefficiencies. We believe that legal institutions are unlikely to mitigate these problems so that the cure may not be better than the disease. Nevertheless, before concluding, in Part VI, we offer some observations as to the implications of our analysis on the policing of bargains under contract law. We then conclude by proposing some directions for future research.

When dealing with non-price terms in contract, a common confounding set of issues stems from the fact that weaker parties, particularly individual consumers, often do not read or understand certain non-price terms, either because they lack the necessary sophistication to do so or because it is not rational for them to spend the time and effort to read and understand the terms. These are very important factors that may lead to inefficient and one-sided terms, and they have been subject accordingly to considerable scholarly study and commentary.¹⁸ We set these issues aside in this paper in order to focus on the impact of bargaining power. The reader may wish to keep

¹⁸ E.g., Louis Wilde and Alan Schwartz, *Equilibrium Comparison Shopping*, 46 Rev Econ Stud 543 (1979); Alan Schwartz and Louis Wilde, *Imperfect Information in Markets for Contract Terms: The Example of Warranties and Security Interests*, 69 Va L Rev 138 (1983); Avery Katz, *Your Terms or Mine? The Duty to Read the Fine Print in Contracts*, 21 Rand J Econ 518 (1990); Russell B. Korobkin, *Bounded Rationality, Standard Form Contracts, and Unconscionability* 70 Chi. L. Rev. 1203 (2003); Xavier Gabaix and David Laibson, *Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets*, 121 Q.J. Econ. 505 (2006); and Yeon-Koo Che and Albert Choi, *Shrink-Wraps Who Should Bear the Cost of Communicating Mass-Market Contract Terms?* University of Virginia Law School Working Paper (2009).

in mind examples involving sophisticated, knowledgeable and well-counseled business actors or consumers, who read and understand their contracts.

I. What Is Bargaining Power?

Although bargaining power is often cited as a critical determinant of contractual terms, neither the meaning of power nor the path of its influence is very clear.¹⁹ People differ in the meaning they attach to the expression. The slipperiness of the term is due at least partly to the fact that the “bargaining power” frequently boils down to a tautology: one party had bargaining power when the resulting agreement is more favorable to that party than its counterpart.²⁰ In light of the ubiquitous use of the expression and its vagueness, we hope to clarify the meaning and then to explore some of the ways in which bargaining power can affect contract design.

Consider a deal struck between a buyer and seller of a good. We can isolate the meaning of bargaining power by setting aside contract design and assuming that the non-price terms have been fixed. That is, all rights purchased by the buyer are well-defined and settled, and the only question is price, which will fall within a bargaining range. At the bottom of the range is the seller’s no-agreement, or reservation price: the value of the seller’s next best use of the good (e.g. the seller might choose to sell it to another buyer or use it herself).²¹ At the top end of the range is the buyer’s no-agreement or reservation price, based on the value of the buyer’s next best use of her funds (e.g. the price at which she can buy the good from another seller or the foregone benefit if she walks away from the purchase). Many game theoretic models presume that the point within this range at which the price is agreed upon is determined by the relative patience and risk aversion of the parties, as they look at the prospect of continued bargaining and delayed agreement.²²

The more common meaning of bargaining power in the negotiation literature and among practitioners focuses on the range itself, in addition to placement within the range. From this

¹⁹ See David A. Lax and James K. Sebenius, *THE MANAGER AS NEGOTIATOR: BARGAINING FOR COOPERATION AND COMPETITIVE GAIN* 249 (1986) (concept of bargaining power is “notoriously slippery”); Duncan Kennedy, (referring to inequality of bargaining power as “internally coherent”); Richard Posner, *ECONOMIC ANALYSIS OF LAW* 102- 104 (3d Ed. 1986)(raises “the general question whether the concept of unequal bargaining power is fruitful, or even meaningful”).

²⁰ Schelling, 22 (1960): “‘Bargaining power,’ ‘bargaining strength,’ ‘bargaining skill’ suggest that the advantage goes to the powerful, the strong, the skillful. It does, of course, if those qualities are defined to mean only that negotiations are won by those who win. But, if the terms imply that it is an advantage to be more skilled in debate, or to have more financial resources, more physical strength, more military potency, or more ability to withstand losses, then the term does a disservice. Those qualities are by no means universal advantages in bargaining situations; they often have a contrary value.” Richard Epstein, *In Defense of the Contract at Will*, 51 *U. Chi. L. Rev.* 947, 974 (1984). “[In a bilateral monopoly bargaining between employer and employee], [t]he question of inequality of bargaining power can now be helpfully restated: which side will appropriate most of the surplus in any negotiations between them. . . An employer can therefore be said to possess an inequality of bargaining power when he is able to appropriate more than half the surplus. . .” 974.

²¹ The negotiation literature commonly refers to these points as the respective BATNAs of the parties (Best Alternative to a Negotiated Agreement). Roger Fisher, William Ury and Bruce Patton, *GETTING TO YES* (1991)

²² In complete, symmetric information bargaining models, such as those by Rubinstein and Stahl, the party who is more patient, i.e., who has a lower discount rate, gets a larger share of the surplus. See Ingolf Stahl, *Bargaining Theory* (1972) and Ariel Rubinstein, *Perfect Equilibrium in a Bargaining Model*, 50 *Econometrica* 97 (1982). In the two-period bargaining games that we present, the patience is partly reflected through the discount factor δ .

perspective, price is a function of the seller's and buyer's respective perceptions of the two reservation prices (each party's own and that of her counterpart).²³ These bounds for the bargaining range, and the price ultimately chosen within this range, are determined by a mix of factors that might be exogenous or endogenous to the negotiations. We divide these factors into five categories: (1) demand and supply conditions, (2) market concentration, (3) private information, (4) patience and risk aversion, and (5) negotiating skills and strategy.

The first category of exogenous factors consists of the *demand and supply conditions* in the relevant market. When there is a significant increase in the demand for the product or reduction in the supply, the market-clearing price will tend to increase and sellers are often said to have increased bargaining power. An example we discuss further below is the tightening of credit during and following the 2007 financial crisis: industry participants noted that when the supply of credit decreased substantially, lenders enjoyed greater "bargaining power" over their borrowers.²⁴

A second category of exogenous factors is *market concentration*. A monopolist's market power is often referred to as its bargaining power. A buyer's no-agreement alternative is limited by the fact that there are no other sellers in the market and his reservation price is correspondingly higher than if he could purchase the same good from a competing seller. Typically, market concentration on the seller side increases price and concentration on the buyer side decreases it. In this sense, commentators often use market power and bargaining power interchangeably.

A third category of exogenous factors contains *informational advantages* that one party may enjoy, often in the form of superior information about one's own reservation price. A party with private information can be thought of as having a type of monopoly stemming from this information.²⁵ We isolate the private information relating to one's own reservation price and treat it distinctly from bargaining power in the analysis later in this paper. Thus, in Parts IV and V, the buyer has private information as to how much he values the good being sold, while the other aspects of bargaining power shift between the buyer and the seller.

We identify a fourth category containing characteristics such as *patience* and *risk aversion* that may determine where the agreed price will fall within a given bargaining range.²⁶ Bold parties, for example, may do better than timid players, and the patient negotiator typically enjoys higher payoffs returns than her impatient opponent. Patience may be, in turn, a function of other factors, such as the solvency and liquidity constraints of the party, or its ability to diversify the risk of an unfavorable bargaining outcome.

²³ Roger Fisher, William Ury, and Bruce Patton, *GETTING TO YES* 102 (1991) ("The better your BATNA, the greater your power").

²⁴ *Infra* notes – and accompanying text.

²⁵ See Antonio Cabrales, Gary Charness and Marie Claire Villeval, *Hidden information, bargaining power, and efficiency: an experiment*, 14 *Exp. Econ.* 133, 135 (2011) ("they are the sole 'owners' of a valuable resource – information about their type").

²⁶ See *supra* note --.

In a fifth category, we put the various *negotiating tactics* that can change the actual or perceived reservation price of either party, so as to induce a favorable shift in the bargaining range.²⁷ For example, a party will be more successful if she can improve her alternative to reaching an agreement or make commitments to third parties that increase the cost of granting concessions in the negotiations. Or, a party might take steps to worsen (or appear to worsen) her opponent's outside opportunities, through credible threats or otherwise.²⁸ We might put in this category the well-known hold-up issue in contract theory: the tactic of inducing the other party to make relationship-specific investments that can later inflict a significant loss on that party from non-agreement. Strategic negotiators also exploit the cognitive biases and errors of opponents, particularly the tendency of individuals to anchor, escalate commitment and be overconfident in their abilities. In some cases, bargaining through one or more agents might improve results. These skills are the subject of many books on negotiation and we do not attempt to summarize them here.

II. How Bargaining Power Affects Contract Design

In this Part, we explore how changes in bargaining power balance may influence non-price terms. We start by articulating the strong- and weak-form versions of the bargaining power “irrelevance proposition.” An irrelevance proposition is one that flows logically from a set of restrictive assumptions, which are suspected to be both unrealistic and binding. Two famous irrelevance propositions in law-and-economics are Modigliani and Miller’s (“MM”) proposition concerning the significance of the choice between debt and equity in corporate finance²⁹ and of Coase’s proposition about the allocation of legal entitlements.³⁰ The assumptions on which the bargaining power proposition is based have been unarticulated up to now and, as we show in this paper, are very strong. Indeed, they are similar to those of the MM and Coase propositions, particularly the assumptions of symmetric information and no transaction costs. These are the assumptions that we begin to unpack in this paper.

²⁷ Rather than analyze the exogenous determinants of bargaining power, negotiation experts focus on the means by which a party can increase its own and decrease its counterpart's advantage in the process. “Analyzing ‘power’ in and of itself has often proved to be a sterile exercise. However, directly focusing on factors that can change perceptions of the bargaining set and the ways that such changes influence outcomes seems more fruitful for both theory and practice.” Lax and Sebenius, *supra* note --, at 257.

²⁸ See, e.g., G. Richard Schell, *BARGAINING FOR ADVANTAGE: NEGOTIATION STRATEGIES FOR REASONABLE PEOPLE* 103 (2d ed. 2006)(threatening your opponent with losses resulting from the failure to agree works because “as astute negotiators have known for centuries and psychologists have repeatedly proven, potential losses loom larger in the human mind than do equivalent gains.”); Avinash K. Dixit and Barry J. Nalebuff, *THINKING STRATEGICALLY: THE COMPETITIVE EDGE IN BUSINESS, POLITICS, AND EVERYDAY LIFE* 290 (1991) (“what matters is his outside opportunity relative to that of his rival. He will do better in the bargaining even if he makes a commitment or threat that lowers both parties’ outside opportunities, so long as that of the rival is damaged more severely.”)

²⁹ Modigliani and Miller, *The Cost of Capital, Corporate Finance, and the Theory of Investment*, 48 *Am. Econ. Rev.* 261 (1958). The authors later presented an irrelevance proposition concerning the effect of dividend policy on firm value. Miller and Modigliani, *Dividend Policy, Growth and the Valuation of Shares*, 34 *J. Bus.* 411 (1961).

³⁰ Ronald Coase, *The Problem of Social Cost*, 3 *J. Law & Econ.* 1 (1961). In some sense, the bargaining power irrelevance proposition can be thought of as an extension of the Coase proposition. In a standard Coase setting, parties bargain over legal rights so as to eliminate the inefficiency, if any, that is engendered by the initial legal entitlement. In the bargaining power irrelevance proposition, there are no default non-price terms; rather, the parties choose a set of non-price terms that maximize the surplus from the transaction.

We then divide our hypotheses of influence of bargaining power on non-price terms into two categories. First, contrary to the strong-form version, a change in bargaining power, through its effect on price, may alter the optimal non-price term. Second, contrary to the weak-form version, bargaining power may lead to a deviation from the optimal terms as a result of the exercise of the bargaining power. We also briefly introduce the more complicated question of how bargaining power influences contract design when negotiations are conducted in stages and through agents.

A. The Bargaining Power Irrelevance Propositions

Some theorists have asserted that the contract terms offered by a monopolist will be essentially the same as those offered by a seller in a competitive market.³¹ Each provision of a contract creates value for at least one party and that party may view the provision as part of the good or service being sold. For example, a warranty, a termination right, or a selected dispute resolution venue is “sold” by one party to the other. The irrelevance proposition states that, if the cost and demand curves are the same for both monopolist and seller in perfect competition, each will offer the same non-price terms. The proposition would extend to bilateral bargaining between buyer and seller in which the balance of power shifts between the two parties.

The proposition is based on the observation that a monopolist that refuses to sell the quality desired by its customers, when their willingness to pay exceeds his cost of providing that quality, is simply leaving money on the table. On this basis, law-and-economics theorists refute the concern of more traditional contract scholars that bargaining power leads to unfair contract terms. Alan Schwartz and Robert Scott provide a recent statement of this refutation:

It is widely believed that parties exercise bargaining power by requiring weaker contracting partners to take unfavorable terms....Terms that superficially appear one-sided are commonly described as the product of ‘unequal bargaining power’. But when bargaining power is determined prior to contract formation, as is common in business contexts, these views are incorrect. Bargaining power instead is exercised in the division of the surplus, which is determined by the price term. Parties jointly choose the contract terms so as to maximize the surplus, which the parties may then divide unequally.³²

Our interest in this paper is the effect of bargaining power on the non-price terms of a successfully completed bargain. We assume throughout that both parties have the sophistication to understand the terms of the contract. This assumption ensures that the contracts we are discussing clearly improve the welfare of both parties, compared to each party’s no-agreement

³¹ In an early article, Alan Schwartz based his analysis on three very weak assumptions that now seem especially incomplete: (1) consumer demand for quality does not vary with the amount of physical product consumed, (2) all firms within a competitive industry use the same technology regardless of the level of industrywide output, and (3) the production function of a monopolist is ‘similar’ to that of a competitive industry in that firms in both industries face the same cost-minimizing factor combinations at any level of output. Schwartz, *supra* note --, at 1073. In a footnote, he also assumes that the monopolist does not price discriminate to set aside the possibility raised by Mussa and Rosen, *supra* note --. *Id.*, at 1075 n44.

³² Schwartz and Scott, *supra* note --, at 554. See Baird, *supra* note --: “Even a monopolist looks for efficient warranty terms. Using inefficient terms compromises the monopolist’s ability to extract rent. She is much better off providing quality goods and efficient terms and charging as much as she can for them.” *Id.*, at --.

position. Experimental literature suggests that parties are more likely to fail to reach a welfare-improving agreement if they have significantly unequal, as opposed to roughly equal, bargaining power.³³ The relevant question in this paper is whether bargaining power affects contract design, in addition to the distribution of the bargaining surplus. We return to the simple sale example introduced above and ask whether a shift in the relative bargaining power between the seller and buyer might alter the agreed-upon warranty. A warranty allocates the risk of product malfunction, depending on features such as its scope and duration. In doing so, the warranty sets incentives for the seller to raise the quality of the good and the buyer to take care in using it. It might also be a means by which the seller can signal the quality of the good. One could think of a surplus-maximizing warranty that optimized across these considerations, given the characteristics of the buyer and seller. Bargaining power might affect the agreed-upon warranty in two directions. It might change the terms of the optimal warranty or it might lead the parties to deviate from the optimum in their agreement.

In Part II.B. that follows, we suggest that a shift in bargaining power might change the optimal non-price terms through its effect on price. The change in price may have a wealth (or substitution) effect on a party's tradeoff between price and non-price terms. It may also alter the severity of the adverse selection or moral hazard problems of one or both of the parties, leading to a new optimal allocation of risk. In Part II.C., we identify how bargaining power can change the efficiency of the non-price terms. In particular, the shift in the bargaining power might lead to a deviation from the optimal terms in three ways: (1) greater or lesser bargaining power might exacerbate the inclination of negotiators to engage in value-claiming rather than value-creating strategies, (2) it may affect the incentives of either party to invest effort and resources in innovating and developing contractual opportunities to create value, and (3) in negotiations characterized by significant information asymmetry, unequal bargaining power might encourage excessive signaling and screening activity. Finally, before concluding this Part, we briefly introduce the more complicated question of how bargaining power influences contract design in the common case where negotiations take place in a two-stage process: the price and other key terms are decided by the business principals first, and the design "details" are then delegated to their respective lawyers.

B. Bargaining Power Can Alter the Optimal Non-price Terms

In this section, we explore how bargaining power can alter optimal non-price terms.³⁴ In the first instance, a shift in bargaining power puts pressure on the price term. This effect, in turn, can

³³See Lax and Sebenius, *supra* note --, at 129-130 ("a number of studies suggest that when a bargaining party attributes his concession to his own weakness and the counterpart's strength, a blowup is likely); Fisher, Ury and Patton, *supra* note --, at -- (importance of preserving the dignity of the weaker party); Jeffrey Z. Rubin and Bert R. Brown, *THE SOCIAL PSYCHOLOGY OF BARGAINING AND NEGOTIATION* 199, 213-15, 217 (1975) ("pairs with equal bargaining power attained higher joint payoffs than those with unequal power"); Nina Burkhardt et al., *Power Distribution in Complex Environmental Negotiations: Does Balance Matter?* 7 *J. Pub. Admin. Res. & Theory* 252, 269, 273 (1997) (power imbalance tends to inhibit successful negotiations). In addition to removing the negative factors detailed above, symmetrical power tends to encourage good feelings between parties, open parties to creative, deal enhancing suggestions, and remove the temptation to use force and threats.

³⁴ In many cases, the conditions that lead to a shift in bargaining power might also change the optimal terms by changing, for instance, the volatility in the economic environment of the parties. For example, an increase in the volatility of economic conditions can lead to both a shrinking in the availability of credit and the value of covenants

change the optimal design of non-price terms in the contract. The important insight here is that any “price” term does not simply allocate surplus. A significant change in price bears on the surplus and may provide opportunities for surplus-creation by the adoption of different non-price terms. We explain how this might happen in two types of circumstances. First, it is helpful to recall that a contract term is part of the “quality” of the good or service being exchanged. A party’s willingness to purchase quality is a function of her wealth, just as her willingness to buy the underlying good or service. Therefore, as price increases because of a shift in bargaining power toward a seller, the buyer’s wealth declines and so does her demand for various non-price terms, such as an extended warranty or the right to sue in the buyer’s own state courts.³⁵ To a casual observer, it may seem like the seller is exercising its bargaining power by reducing the quality of the non-price terms, whereas the seller is in fact responding to the wealth effect of a higher price on the buyer’s demand for such terms.

This effect may be at work in an employment contract or a venture capital (“VC”) investment in a start up. VC contracts contain financial terms (dividing the equity payoffs between the VC fund and the entrepreneur) and governance terms (for example, the VC fund’s seats on the board). The financial terms can be thought of as “price” and the governance terms as “non-price” terms. The governance terms are valuable in addressing problems of moral hazard, but entrepreneurs tend to place offsetting value on maintaining control of the fate of their own company. If the VC has more bargaining power than the entrepreneur, the entrepreneur is compelled to sell a larger portion of the value of the company, as well as agree to surrender control of, for instance, a given number of seats on the board of directors. As power shifts to the entrepreneur because of expansion in available capital, she can offer a smaller share of equity to the VC fund for every dollar of capital invested (a lower price for capital). Her expected wealth increases and the marginal tradeoff between money and control changes as a result: instead of reducing the share of equity she gives the VC, she would offer instead fewer outside seats on the board.

This phenomenon may occur even in contracts between firms because their individual agents trade-off monetary and non-monetary benefits at different rates, depending on their wealth. Consider another contract in the stream of venture capital funding: the limited partnership agreement of the VC fund. This agreement provides for the management fees and carried interest that are paid to the venture capitalist. The venture capitalist also enjoys private benefits from managing the fund, including prestige and perquisites. His pursuit of these benefits is costly to the investors (limited partners) to the fund. To address these incentives, the partnership

that constrain the borrower’s incentive to take risks. We set this possibility aside in this paper because it does not follow from the shift in bargaining power.

³⁵ There may be other substitution effects arising from price changes. Carlton suggests customers may trade off consumption tomorrow for today, so that consumption shifts to tomorrow. At least to the extent that the impetus to change prices is changes in supply and demand conditions, some empirical studies have documented price rigidity in some industries. Delivery lags, for example, can be market-clearing devices, in lieu of or in addition to price. Dennis W. Carlton, *Equilibrium fluctuations where price and delivery clear the market*, 14(2) Bell J. Econ. 562 (1983) (finding that fluctuations in delivery lags are approximately as important to the equilibration of demand and supply as are fluctuations in price); Dennis W. Carlton, *The rigidity of prices*, 76(4) Am. Econ. Rev. 637 (1986). An extreme form of wealth effect may be a binding wealth or financial constraint. Although the literature assumes that the buyer does not face any limitations on her *ability* to pay, this may not necessarily be true: the buyer’s willingness-to-pay does not necessarily correlate with her ability to pay. If the buyer is financially constrained and cannot obtain financing, this may lead to inefficient non-price terms. See Yeon-Koo Che and Ian Gale, *The Optimal Mechanism for Selling to Budget-Constrained Buyer*, 92 J Econ Theory 198 (2000).

agreement typically includes restrictions on the decisions and activities of the venture capitalist. The tightness of these restrictions reflects, no doubt, the cost of the private benefits to the investors, but also the tradeoff in the eyes of the venture capitalist between monetary compensation and the value of such private benefits. In their study of venture capital partnerships in the 1990s, Paul Gompers and Josh Lerner observed that cyclical changes in the demand for and supply of venture capitalists may explain shifting contracting patterns.³⁶ While the supply of capital varies, rigidity in the supply of experienced venture capitalists causes periodic imbalances. When capital inflows are greater, the venture capitalists monetary returns are higher. They also noted, however, that the increase also leads to dilution of restrictions on activities of venture capitalists; but they do not explain the mechanism by which this effect takes place.³⁷ The explanation may lie in the shifting rates of substitution caused by wealth effects we describe here.

The effect of bargaining power through price on non-price terms may also run through a second causal chain. Changes in price have an impact on the nature of adverse selection and moral hazard problems in some transactions. Markets plagued by these problems—such as lending or insurance markets—may not clear, leaving excess demand or excess supply. For example, faced with excess demand, insurers may be reluctant to raise premiums for fear of driving out the lower-risk customers and being left with a riskier pool. Non-price contractual terms are commonly designed to mitigate these information problems by, for instance, screening out the high-risk customers. A change in price can increase or decrease the severity of these problems and some non-price terms become correspondingly more or less valuable. Thus, changes in price can alter the optimal use of these terms. In the warranty example, when a seller gains bargaining power and can charge more for a warranty, it is more likely to lose low-risk customers and attract a riskier pool of customers. Therefore, the rise in price may itself lead to a narrowing of the scope of the optimal warranty.

A loan contract is a more powerful example because the dual problems of adverse selection and moral hazard are widely known. These contracts typically include a set of covenants and events of default. The violation of the covenants may give the lender the right to accelerate the maturity of the loan and if the borrower fails to pay the accelerated amount, the lender may then enforce its claim against the borrower's assets. Covenants may restrict some actions or decisions, such as the borrower's incurring new liabilities, selling assets, or making distributions to stockholders. Or, covenants may set tripwires that trigger default, including financial ratio tests such as maximum debt-to-equity or interest-to-earnings ratios. Contracts vary in terms of the types of behavior that is restricted or the types of tripwires, as well as how close the tripwires are set to the borrower's current condition. Both the breadth and tightness of covenants are matters of contract design.³⁸

Although covenants are sometimes regarded as “boilerplate” provisions, covenant packages vary considerably across contracts between different lenders and borrowers. A growing body of

³⁶ Paul Gompers and Josh Lerner, *THE VENTURE CAPITAL CYCLE* 31-2, 45-7(1999).

³⁷ See George G. Triantis, *Financial Contract Design in the World of Venture Capital*, 68 U. Chicago L. Rev. 305, 319-21 (2001) (asking the irrelevance question: why would venture capitalists not use their bargaining power to capture a larger share of the monetary surplus from efficient contracting?).

³⁸ [cite here financial studies of determinants of covenant breadth and tightness]

theoretical and empirical finance scholarship identifies firm-specific and market determinants of the intensity and tightness of covenants. The industry press also suggests a strong connection between the supply and demand conditions and covenant patterns. Covenant-lite deals grew at a staggering pace through the first half of the past decade until the onset of the financial crisis in 2007, and market observers attributed it to the excess supply of credit.³⁹ The market for covenant-lite loans collapsed in the second half of that year and was followed by a period of more extensive and tighter covenants during 2007-09. Reports suggested that covenant-lite deals then emerged again because of the excess supply of investment funds, at least for higher-grade borrowers.⁴⁰ The following recent explanation by a partner at law firm of Paul, Weiss is typical:

Covenant-lite (cov-lite) loans became widespread at the top of the last credit cycle before the 2007 credit crunch. During the credit crunch, however, new cov-lite loans largely disappeared from the market because lenders had *greater market power* to reject these types of borrower-friendly deals....[S]tarting in 2010, cov-lite loans began reappearing in the syndicated loan market. Borrowers can obtain cov-lite loans because of market dynamics. At the top of the last credit cycle, there was an *oversupply of capital*, and *lenders competed* for deals from private equity sponsors and borrowers. Because there was a *greater supply* of capital than there was demand to borrow capital, borrowers had *more leverage* to negotiate looser and more favorable terms, including cov-lite structures.⁴¹
[emphasis added]

These accounts place great emphasis on supply and demand, and the consequent balance of market power. This is puzzling for the conventional law-and-economics position. If a covenant creates value by mitigating adverse selection and moral hazard problems, borrowers with bargaining power should be at least as eager to agree to them as when they lacked bargaining power. In fact, the very ability to extract most of the surplus from a deal would give them a greater share of the surplus created by these terms. A more elaborate story is needed therefore to explain the connection between shifts in bargaining power and changes in contract design.

³⁹ In a report by Standard & Poor's on the eve of the financial crisis in mid-2007, the ratings agency observed that "Strong loan market liquidity and the continued pace of private equity sponsored LBOs are driving a record volume of leveraged loans in 2007. Such favorable market factors, combined with growing investor demand from structured finance vehicles and hedge funds, have allowed bank facilities with weakened 'covenant-lite' loan structures to emerge as the instruments of choice for many issuers. As the volume of leveraged loans reaches an all-time high, the proportion of covenant-lite facilities has increased tremendously... It remains to be seen whether leveraged loans will revert to more traditional structures when the credit cycle turns.... There has already been some pushback so far this year as market conditions begin to soften, with certain transactions unable to get through syndication without a robust covenant package." Standard & Poor's, *THE LEVERAGING OF AMERICA: COVENANT-LITE LOAN STRUCTURES DIMINISH RECOVERY PROSPECTS 2* (July 18, 2007).

⁴⁰ E.g., Kate Laughlin, *Covenant-lite loans are back but investors hope to limit mistakes*, Financial Times (November 24, 2010) ("today's loan market is for the most part a seller's environment where investors are flush with cash they need to put to work... [S]ome investors buying the covenant-lite deals are not solely loan investors, so in their hunt for high-yielding paper, covenant concerns are a low priority"); Michelle Sierra Laffitte, *IFR-Covenant-lite buyout loans return to US loan market*, (January 31, 2011) at <http://www.cnbc.com/id/41347717> ("As the market gets hotter, companies are expected to try to reduce spreads and slash covenants in deals that were completed recently"); Michael Aneiro, *Global Finance – Aleris Debt Sale: 'Covenant-Lite'*, Wall St. J., C3 (February 7, 2011) ("[D]emand has pushed the average junk-bond yield down to 7.01%... and has allowed issuers to water down investor protections, or covenants, that govern new offerings").

⁴¹ Eric Goodman, *Covenant-Lite Loans: Traits and Trends*, Practical Law The Journal 36, 37 (September 2011)

Agency costs internal to lending institutions might provide part of the explanation. Investment managers face pressures to meet targets for returns. Where there is competition for relatively few debt securities, they may be willing to sacrifice covenant protection for a higher yield. The returns are immediately apparent while the consequent risk may or may not reveal itself later. The financial crisis, however, drew dramatic attention to these risks, so the re-emergence of covenant-lite loans is not as easily explained. In an alternative explanation, we suggest that the impact of bargaining power is mediated through an effect on price.

Suppose that lenders acquire more bargaining power because exogenous forces tighten the supply of credit. The first order effect is to place upward pressure on interest rates. As noted above, the lower-risk borrowers may exit, leaving a riskier pool. These borrowers also face incentives to take greater risks in order to make borrowing at a higher rate worthwhile. These prospects of exacerbated adverse selection and moral hazard would discourage lenders from raising interest rates in the face of excess demand and to ration supply. The second order effect, however, is that the value of strict covenants and collateral, to discourage and deter high-risk borrowers, would be greater. The optimal contract design would have both tighter covenants and, probably, broader collateral as a result of the change in market conditions.⁴² This explanation is consistent with empirical work that has found correlation between market rates of interest and covenant breadth.⁴³

In sum, in relationships affected by asymmetric information (such as lending or insurance), price is an imperfect tool for adjusting for supply or demand changes, or shifts in bargaining power. As we have noted, changes in price can exacerbate the information problems of adverse selection and moral hazard. Therefore, the parties can improve the efficiency of their contract by using non-price terms instead to shift value from the “weaker” to the “stronger” party.⁴⁴ As a result, the balance of bargaining power might in fact affect contract design.

C. Bargaining Power Can Lead to Inefficient Non-Price Terms

In designing their contract, the parties might not be aware of the non-price terms that maximize their surplus. Two factors are important in this regard. First, one or both of the parties must invest in the task of designing: processing information, considering alternatives, tailoring them to the parties’ circumstances and innovating new solutions.⁴⁵ While design is costly to the party who invests in it, the incremental value of the investment is shared by both parties.⁴⁶ The consequence of this externality is that the parties will underinvest and their agreement may be less efficient. However, if a party has bargaining power because, for example, it enjoys a

⁴² We explore this effect in a companion paper that presents a model of this phenomenon and, in this light, examines existing data concerning cyclical changes in patterns of covenant and collateral. Albert Choi and George Triantis, *Market Conditions and the Design of Debt Contracts* (working paper 2011).

⁴³ See, e.g., Michael Bradley and Michael R. Roberts, *The Structure and Pricing of Corporate Debt Covenants* (working paper 2004).

⁴⁴ We make a similar point about Material Adverse Change clauses in corporate acquisition contracts below, *infra* at notes – and accompanying text.

⁴⁵ See George Triantis, *Modularity and Innovation in Contract Design* (working paper 2011).

⁴⁶ There are countervailing strategic reasons for writing the first draft of an agreement. For example, it can lead the opponent to anchor on the proposed division of surplus and, more generally, on a perception of the bargaining range.

monopoly or the capacity for patience, it might have a better incentive to expend the resources necessary to develop value-increasing non-price terms because it can capture most of the value.⁴⁷ The adherence contracts of monopolists were the *bête noir* of the early academic commentators, such as Friedrich Kessler, who thought that the non-price terms in these contracts would be significantly less favorable to the counter parties.⁴⁸ The law-and-economics scholars who followed suggested that they would be efficient and no different than those produced in competitive markets. The ability of those with monopoly or bargaining power to capture the payoffs from innovative design suggests that, contrary to both sets of scholars, the terms might be in fact both different and *more* efficient.⁴⁹

Second, agreements create value by exploiting comparative advantages in endowments and differences in preferences, and parties often need to exchange information during negotiations to make such agreements possible. Yet, a party's pursuit of bargaining power in negotiations can be antithetical to the creation of value.⁵⁰ In the language of negotiation experts, shared information enables value-creation while private information promotes value-claiming. To increase its share of the surplus, each party strives to conceal its own information and extract the private information of its counterpart. For example, a buyer might agree to a limited warranty in order to hide the fact that the good or service being purchased is of great value to her. Faced with incomplete information, the seller may screen for the relevant information by offering a choice between a contract with a complete disclaimer and one with a full warranty. The low-valuing buyers, in contrast, may be eager to communicate their relatively low valuations but have difficulty doing so credibly. They may signal their low valuations by agreeing to a complete disclaimer. Where the parties use non-price terms to screen or to signal, as the case may be, these terms are likely to be inefficient.

⁴⁷ *Id.*, at --.

⁴⁸ *Supra* note --.

⁴⁹ In other words, this investment in design is specific to the parties' transaction and the investing party is vulnerable to hold-up over its sunk investment. The benefit from one-sided bargaining power has a broader application in relationships in which one party can make a valuable but relationship-specific investment to enhance the surplus from the transaction. The well-known problem of hold-up in contract theory arises when neither the value nor the investment can be verified in court (and therefore is not contractible). Endowing the investing party with superior bargaining power can encourage it to make the investment, thereby improving efficiency. See, e.g., Oliver Williamson, *The Economic Institutions of Capitalism* (1985); Sanford J. Grossman & Oliver Hart, *The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration*, 94 *J. Pol. Econ.* 691 (1986); Oliver Hart and John Moore, *Incomplete Contracts and Renegotiation*, 56 *Econometrica* 755 (1988); Oliver Hart and John Moore, *Property Rights and the Nature of the Firm*, 98 *J. Pol. Econ.* 1119 (1990); and Oliver Hart, *Firms, Contracts, and Financial Structure* (1995). Another way of solving the hold-up problem is by letting the parties implement an ex post revelation mechanism and by banning renegotiation all together. So long as the investment does not directly affect the other's valuation too much, the parties will be able to induce both the efficient relationship-specific investment and efficient ex post trade. See Yeon-Koo Che and Donald Hausch, *Cooperative Investments and the Value of Contracting*, 89 *Am. Econ. Rev.* 125 (1999).

⁵⁰ The negotiation literature speaks of a fundamental tension between claiming and creating value. E.g., Lax and Sebenius, *supra* note --, at 38-41, 245-6 (1986)(the "negotiator's dilemma": individually rational for each party to claim value, but this constrains ability to create value); Deepak Malhotra and Max H. Bazerman, *NEGOTIATION GENIUS: HOW TO OVERCOME OBSTACLES AND ACHIEVE BRILLIANT RESULTS AT THE BARGAINING TABLE AND BEYOND*, Part 1 (2007); Robert H. Mnookin, Scott R. Peppet and Andrew S. Tulumello, *BEYOND WINNING: NEGOTIATING TO CREATE VALUE IN DEALS AND DISPUTES* 9-43 (2000). For example, the making of binding commitments to third parties or threats to the opposing party may be helpful in claiming value, but constrains the flexibility and good will necessary to create value. Lax and Sebenius, *supra* note --, at 245-6.

The danger of inefficient terms resulting from screening or signaling is well known.⁵¹ What is significant for our analysis is the more complicated question of whether the allocation of bargaining power changes strategies and thereby the degree of inefficiency.⁵² In Part IV, we demonstrate with a numerical example that the inefficiencies are most severe when there is significantly unequal bargaining power *in either direction*. In terms of market concentration, they are most severe either when there is a monopoly (excessive screening) or perfect competition among sellers for buyers (excessive signaling or cream skinning). The party motivating the inefficient non-price term in this way is the one with the bargaining power. The intuition is that the dominant party is willing to accept the consequent incremental loss of surplus in order to improve its share. The results are consistent with those from the industrial organizations literature.

In Part V, we show that when the parties share the surplus more “evenly,” each party has less of an incentive to engage in either screening or signaling, and the agreement they reach is more efficient. We define more even bargaining power in three ways. In the first, we introduce some competition by allowing another seller (an entrant) to possibly compete against an existing seller (an incumbent). In the second, the power of commitment is reduced by allowing the contracting parties to renegotiate the original contract with some chance. In the third, the seller’s power to dictate the terms is curtailed by allowing the buyer to make a counter-offer with some delay.

In each of these cases, we demonstrate the key result that the conditions of more even bargaining power can mitigate or even eliminate the inefficiencies of screening and signaling through non-price terms. While the three variations require different game theoretic presentations, they share a common theme. When one party deliberately imposes an inefficient non-price term and leaves an unrealized surplus on the table, it provides a strong incentive to others in capturing the unrealized surplus and eliminating the inefficiency. In the first variation, that incentive is given to a competitor (entrant); in the second, to the seller through renegotiation; and in the third, to the buyer. In the process, we argue that it is important to strike a proper balance (for instance, by not introducing too much competition) so as to not give the other too much bargaining leverage. The Appendix presents a more general model in which a social planner (mechanism designer) can choose what types of contract to offer to the buyer and the seller. The model shows that when the social planner cares only about the seller’s or the buyer’s welfare, the social planner will also

⁵¹ *Infra* notes -- and Part III.

⁵² Jason Johnston examines the effect of bargaining power on contracting for caps on damages for breach: specifically, the decision to accept or opt out of the rule in *Hadley v. Baxendale*. Johnston demonstrates that where the seller is a monopolist, its high-value buyer would hesitate to ask for higher caps because this would inform the seller that there is more value to extract by exploiting its market power. For its part, however, the seller has the incentive to screen by price/quality discriminating, in the manner described in Part IV.B.I below. Johnston, *supra* note --, at 636-8. See Ayres and Gertner, *supra* note --, at 735-742. Ian Ayres and Robert Gertner suggest that the efficient liquidated damages provision (given buyer type) would be agreed to if the market were competitive instead. However, we note that the liquidated damages term they examine is unlike other non-price provisions because the seller’s cost does not vary with buyer type: in their paper, because the probability of breach (whether the carrier does or does not deliver on time) does not depend on buyer type, conditional on a liquidated damages term, the expected liability is the same for both types of buyers. *Id.*, at 742. This is not the case for the terms we examine in Part IV. If we think about a warranty term, for instance, even when the size of the warranty is fixed, the cost of serving a buyer under the warranty term depends on the buyer type because the probability of claiming that warranty depends on the characteristics of the buyer.

impose inefficiency in the contract, but when the social planner cares about them more evenly, such inefficiency gets mitigated or eliminated.

Before concluding part II, we identify one more context in which bargaining power may have an effect on contract design: the types of business transactions that are negotiated in two stages and through agents: a term sheet, letter of intent or similar document settles the price and other key terms, and later negotiation (typically through lawyers) settles the remaining non-price terms for the definitive contract.

D. Bargaining Power in Two-Staged (Price-First) Negotiations

Any given contract term is unlikely to yield value to both parties. Therefore, logrolling is an essential element to creating value in bargaining. A buyer agrees to a lower quality of product, for example, in return for an earlier delivery date or a lower price. In commercial deal making, the broadest opportunity to create value in this way exists when parties can trade non-price terms for adjustments in price. For this reason, it would seem optimal to leave the price term open until all other terms have been settled. Negotiations may nevertheless fail to reach the surplus-maximizing deal because of the obstacles discussed in the previous section. But fixing price at an earlier stage would further limit opportunities for value-creation.

Although price terms are usually determined after the non-price terms have been set, this is not always the case. For example, in commercial loans, private equity investments, and corporate acquisitions, many terms are agreed upon after the price is settled.⁵³ In the first stage of negotiations, the parties negotiate price and key non-price provisions, often without their lawyers.⁵⁴ This stage typically concludes with the signing of a document such as a term sheet, letter of intent, or memorandum of understanding, which is not legally binding. The parties then turn over the second stage of negotiations to their lawyers to “work out the details” in a definitive contract,⁵⁵ including representations and warranties, closing conditions, covenants, and termination rights. These terms are usually settled without adjustment to price. The parties would probably have an expectation of these terms when they struck a price in the first stage (perhaps what is “market” at the time). If the second-stage terms fall outside a range about these expectations, they may be compelled to reopen the price. Although the first-stage agreement is not legally binding, there are non-legal costs to allowing the deal to collapse after this point. This leaves the lawyers with a meaningful space within which to bargain on behalf of their clients over non-price terms.

This arrangement leads to a peculiar process in the second bargaining stage between the lawyers, during which the two sides cannot use the price term in their efforts to create value by

⁵³One might contrast these deals with similar transactions, such as public or private offerings of securities, in which these terms do appear to be priced after they are settled.

⁵⁴ See, e.g., James C. Freund, *ANATOMY OF A MERGER* 53-55 (1975).

⁵⁵E.g., Mnookin et al., *supra* at 129-35 (“Lawyers... bear primary responsibility for translating into legally recognizable concepts the parties’ preliminary understanding of their deal. In addition, legal drafting involves identifying and allocating ancillary risks that the clients may not have considered”) He later notes, in discussing the problem of overlawyering, that “lawyers can waste the client’s time and money by focusing on small or unlikely risks that do not justify contractual planning.” *Id.*, at 148.

logrolling.⁵⁶ Consider, for example, a corporate acquisition in which the price is set in a letter of intent before many of the terms—particularly, representations and warranties, covenants, closing conditions, termination rights—are negotiated by the lawyers. Although the letter of intent is usually not binding, parties rarely adjust the price to compensate for concessions in these terms in either party’s favor. In a collective effort to integrate the best practices in the acquisition field, the ABA Committee on Mergers and Acquisitions appointed a task force charged with producing and updating a Model Stock Purchase Agreement.⁵⁷ For our purposes, it is particularly significant that the report emphasizes repeatedly the divergent positions of buyers and sellers. The Preliminary Note, for example, describes the document as follows.

The Model Agreement has been prepared as a resource for a buyer’s first draft of a stock acquisition agreement. In a buyer’s first draft, the provisions generally favor the buyer and are not necessarily typical of the final language in a fully negotiated agreement and consummated transaction....Sellers usually will not agree to all the proposed provisions, and their counsel can be expected to negotiate for language more favorable to them. The commentary identifies some sections of the Model Agreement that are likely to prompt objections by a seller, but most, if not all, provisions are negotiable....

The Note lists three factors that may influence the scope and content of the ultimate agreement, the second of which is “the relative negotiating positions of the parties”:⁵⁸

Where the target is highly sought-after and there are competing offers, a seller may view some of the provisions of the Model Agreement as too aggressive or otherwise inappropriate.... On the other hand, if the target is financially distressed or the seller is otherwise in a weak bargaining position, the buyer might be even more demanding in the draft it presents to the seller.⁵⁹

We can illustrate the perspective of the task force through its comments on two types of provisions: seller representations and the closing condition requiring no material adverse change (MAC). Seller representations are among the terms negotiated between the lawyers, and the representations must be true in order for the deal to close.⁶⁰ The Note describes the conflict between the parties:

⁵⁶ Although logrolling between terms can yield value, negotiation specialists also warn about the countervailing feasibility or danger of having too many issues on the bargaining table. To mediate between the benefits and costs of multi-issue negotiations, Howard Raiffa proposed a process under which the parties first agree to a simple deal and then ask their agents to improve on it by incorporating other opportunities for logrolling. Howard Raiffa labeled the strategy “post-settlement settlement”. Howard Raiffa (1984). See Schell, *supra* note --, at 180-1, 186-7, 221-6. Similarly, the two-stage process described above offers a hybrid alternative to both a simple negotiation where the details are preset and a complex negotiation in which all terms are on the same table.

⁵⁷ ABA Mergers & Acquisitions Committee, MODEL STOCK PURCHASE AGREEMENT WITH COMMENTARY (2d ed. 2010)

⁵⁸ The other two factors are: the size of the transaction and whether the target is a subsidiary of another corporation. *Id.* at viii..

⁵⁹ *Ibid.*

⁶⁰ The agreement may also provide that the representations survive closing.

The buyer typically will ask the seller to bear most of the risk associated with discoveries that directly or indirectly relate to the target's business prior to closing – issues that may be material to pricing the acquisition. The seller may counter that unknown contingencies are inherent in operating any business and should be borne by the owner of the business at the time they arise.⁶¹

Similarly, the definition of Material Adverse Change sets the contingencies under which the buyer can walk away from the deal at closing. The Comment states that

Buyers generally prefer a broad MAC provision such as the one used in the Model Agreement. A broadly drafted MAC provision is thought to provide buyers with greater protection, as it gives buyers greater flexibility to terminate or renegotiate an acquisition agreement in the event of unforeseen adverse events that are not described in the agreement....Sellers will want to minimize Buyer's ability to walk away from or renegotiate the agreement...[and] will try to limit the definition of MAC to restrict the events or occurrences that could trigger the MAC condition....One way... is by requesting exceptions ('carve-outs') to the MAC definition.⁶²

The breadth of the MAC definition is perceived to be determined by bargaining power. Lawyers and business analysts observed that MAC conditions were "seller friendly" and contained more carve-outs when private equity firms were flush with funds before the financial crisis. After the crisis, credit tightened and buyers gained bargaining power, leading to more "buyer-friendly" provisions with fewer carve-outs.⁶³

Under what we have labeled the indifference proposition of bargaining power, this analysis is puzzling. Like many other terms, representations and warranties allocate risks and might be thought of as insurance products within acquisition agreements. For a variety of possible reasons, one party can bear the risk at lower cost and the contract can create value by providing that this party will insure the other party against the risk, for a price.⁶⁴ Both parties can be better off and

⁶¹ Id., at vii – viii.

⁶² Id., at 12-13.

⁶³ A report out of the Wharton Business School in early 2007 quotes a partner in the law firm of King & Spaulding as saying that "[i]n addition to record prices, the competition for private equity deals is altering the terms for deals in favor of sellers....In addition to disappearing financing contingencies, Parish pointed to other trend in deal terms that are moving in favor of sellers....Assumption of industry risk in material adverse change conditions,, [And] Buyers are agreeing to shorter indemnification periods, from up to three years to a year or less." Knowledge @ Wharton, *Private Equity Bidding Wars: When Capital-rich Funds compete, Intangibles Win the Deal* (April 26, 2007) <http://knowledge.wharton.upenn.edu/article.cfm?articleid=1721> (quoting William Parish, Jr., a partner in the firm's Houston office). In 2008, the law firm of Nixon Peabody published a report of its review of acquisition agreements dated June 1, 2007 to June 1, 2008. The report stated: "while the MAC definitional elements were slightly narrower than in the prior year, we noted a decrease in the number of MAC exceptions... indicating the advancement of buyers' bargaining power during this period... due at least in part to a lack of credit available to financial transactions." Nixon Peabody's *Seventh Annual MAC Survey* (2008), http://www.nixonpeabody.com/linked_media/publications/MAC_survey_2008.pdf.

⁶⁴ MAC clauses are understood to promote the following two objectives. First, the buyer's contingent option to terminate gives the seller the incentive to maintain the value of its assets between the time of the contract and closing (the moral hazard problem). Second, the seller's willingness to grant such an option signals its information as to the financial and economic condition of the target (the adverse selection problem). At the same time, most

therefore should agree to that risk allocation, regardless of relative bargaining power. Yet, like the authors of the model agreement, practitioners frequently view these negotiations as zero-sum. While terms can be traded within this stage, the inability to trade off risk allocation against a price adjustment removes significant potential value from the table. In this respect, bargaining power is a determinant of the non-price terms because the outcome of the second stage is constrained and predominantly distributional.

Yet, even in this set-up, the impact of bargaining power is complicated. Suppose that the parties agree to the price in the first stage and leave to the second stage the scope of the buyer's option to walk away from the deal under a MAC clause. If the seller has superior bargaining power, then it might secure a higher price than it otherwise would during the first stage. In the second stage, the parties' lawyers negotiate the carve-outs from the buyer's MAC condition, among other terms. Suppose that the seller's bargaining power derives from its greater patience: the buyer faces more time pressure to have the deal signed. The seller's attorney can then present the buyer with a take-it-or-leave-it offer and get a more extensive carve-out from the MAC. The buyer may or may not be able to get a countervailing concession on another non-price term at this stage. Anticipating this in the first stage, the buyer's reservation price is accordingly lower. Since the seller gets the greater portion of the bargaining surplus, the anticipated exercise of the seller's power in the second stage in fact harms the seller (more than the buyer) in the first stage. Thus, the seller has the incentive to pre-commit to limit the scope of its bargaining power in the second, in order to secure a higher price. In the two-stage bargaining process, this may be difficult to do and the buyer will presume an unfavorable outcome in the second stage (of course, as noted above, within some range of expectations). As a result, the non-price terms negotiated in the second stage may vary from "seller-friendly" to "buyer-friendly", depending on which party has bargaining power, and they may be inefficient as a result.

"Seller-friendly" and "buyer-friendly" MACs are susceptible to other explanations based on the buyer's inability to observe the private information held by the seller as to its value. First, as we described in the context of loan covenants, changes in the supply or demand for acquisitions can also exacerbate or mitigate the underlying moral hazard and adverse selection problems. Given the target seller's private information as to its value, price terms may function imperfectly as means of adjusting for supply-demand imbalance or changing the division of surplus. In particular, a price change may make moral hazard or adverse selection more severe. The parties may improve the efficiency of their deal by using a non-price terms instead to shift value from one party to the other.⁶⁵

Second, the asymmetric information about the target's value may encourage either the seller or the buyer to screen or signal, respectively. We demonstrate at greater length in Part IV that these actions can give rise to inefficient contract design, particularly at the extreme ends of the bargaining range at which either the seller or the buyer is the residual claimant of the surplus.

MACs are subject to carve-outs—defined material changes that do not trigger such a termination option. These carve-outs describe exogenous contingencies, such as the general downturn in the economy or seller's industry, that are typically outside the control and private knowledge of the seller. See Albert Choi and George Triantis, *Strategic Vagueness: The Case of Corporate Acquisitions*, 119 Yale L. J. 848 (2010). The authors discuss also a third objective: facilitating renegotiation in case the deal turns out to be unattractive before closing.

⁶⁵ Choi and Triantis, *Debt Covenants*, supra note --.

The party with such bargaining power may use the breadth of the MAC clause to reduce the counter-party's informational advantage, rather than to enhance the surplus by addressing the moral hazard and adverse selection obstacles. When the seller enjoys (complete) bargaining leverage, the seller could use different MACs to screen different types of buyer. The buyer whose reservation value is less sensitive to an external shock would be more willing to sign a narrow MAC (or broader carve-outs) than the buyer whose reservation value is more volatile. By offering a combination of different MACs with corresponding prices, the seller can better extract the surplus from the transaction. When the bargaining power shifts to the acquirer, it might similarly use a different MAC and price combinations to signal a more volatile reservation value, so as to pay a lower price for the target. These screening and signaling efforts, respectively, do not increase the size of the surplus; indeed, they may compromise the MAC goals of controlling the seller's moral hazard. We demonstrate in Part V.C an important result that the parties are more likely to agree to the efficient breadth of a MAC if their bargaining power is more even. This is a rough hypothesis at this point, but at least an attempt to gain some insight into the role of bargaining power in the design of these terms.

In sum, the bargaining power irrelevance proposition rests on the premises that the parties are risk neutral and that there are no information imperfections or other transaction costs. We have suggested a variety of ways in which bargaining power may be relevant when these assumptions are relaxed. Each way can be elaborated beyond our brief introduction in this Part. With respect to some of these explanations, we discuss them more fully in companion papers.⁶⁶ In Parts III, IV and V, we examine in greater detail the impact of bargaining power in cases of asymmetric information, particularly where one party has private information as to its reservation price and either tries to conceal it or cannot readily reveal it.

III. Product Quality under Monopoly and Perfect Competition

In the industrial organization literature in economics, a body of scholarship analyzes whether, all else equal, the product quality offered by a monopolist or in perfect competition is different from that of a social planner seeking to maximize social welfare. This is relevant to our inquiry, of course, because the terms of a contract are elements of the quality of the underlying product. Consider first the monopolist that sells a single good at a single price in a given market. Under the standard assumptions, we know that the monopolist will sell a lower *quantity* than optimal, thus creating a dead-weight-loss. The reason is straight-forward. The monopolist knows that an incremental decrease in price brings additional customers, but at a loss of revenue from all other consumers who were willing to make the purchase even at the higher price. While the second effect would yield no loss in social welfare, the monopolist finds it costly. To minimize the effect of this infra-marginal revenue loss, the monopolist charges a price higher than the marginal cost of production and serving fewer customers than under competition.

When choosing the level of *quality* to be offered to its consumers, the monopolist chooses the quality according to the preferences of the marginal buyer—the buyer who is just indifferent between buying and not buying at the monopolist's price. If the marginal buyer values an incremental increase in quality at least as much as the incremental cost to the monopolist, then

⁶⁶ Choi and Triantis, *Debt Covenants*, supra note --. We also plan to analyze more closely the effect of bargaining through lawyer-agents.

the monopolist improves the quality for everyone, but not otherwise. If all buyers share homogeneous preferences for quality, then the monopolist provides the optimal quality of contract terms (albeit at a supra-competitive price). However, if the marginal buyer has higher willingness-to-pay for quality than the infra-marginal buyers, the infra-marginal buyers will be compelled to purchase the additional quality even though they would be unwilling to pay for it. Conversely, if the infra-marginal customers would pay for an increase in quality, but the marginal buyer assigns an incremental valuation lower than the incremental cost, the monopolist offers the higher quality to no one. Thus, if buyer preferences are heterogeneous, the quality offered by a monopolist may be higher or lower than the optimal.⁶⁷ The social planner, on the other hand, would base the quality on the preferences of the average buyer. Hence, as long as the preferences of the average buyer and the marginal buyer are not identical, the quality chosen by the monopolist differs from that which would maximize social welfare.

The analysis so far assumes that the market can provide product with only one level of quality. Many types of contract provisions confer different values to different buyers. The three examples at the beginning of the paper illustrate this claim. A warranty is more valuable to a buyer who uses the good more frequently and intensively. A franchisee is more concerned about sudden termination if it has made a large investment in the franchise or if its location is more vulnerable to short-term shocks. A seller benefits from litigating in its home jurisdiction if it anticipates more rather than fewer disputes over its performance, and involving larger monetary claims. In addition, as we emphasize below, the cost to a contracting promisor is also likely to vary with the type of buyer for similar reasons. In evaluating the effect of market or bargaining power on contract terms rather than the physical quality of products, not only should we assume heterogeneity of preferences among buyers but also that the market may offer more tailored products that cater to differing preferences.⁶⁸

When buyers have heterogeneous preferences over quality and the monopolist can offer different price-quality combinations, the monopolist can increase its profits by discriminating among its buyers, on the basis of price, quality and contract terms. If the monopolist knew each buyer's preferences, it would offer to each customer the quality and contract terms that would maximize the surplus and charge a price that would allow the monopolist to capture the entire surplus. If the monopolist has this information and discriminates, market power would not distort quality and the irrelevance proposition would be borne out. The buyer who places a higher value on warranty is offered an extended warranty clause at a higher price, while a buyer who values it less purchases a limited warranty at a lower price. Better yet, even if two buyers place the highest value on extended warranty, the monopolist will offer the same extended warranty to both buyers but at different prices.

Price/quality discrimination on the basis of contract might be quite effective because the monopolist can effectively prevent arbitrage, where low-valuing customers would sell their rights to high-value buyers. Warranties are often expressly non-assignable, for example, as are the franchises and purchase orders introduced earlier. Rather, the significant problem facing the

⁶⁷ See, e.g., A. Michael Spence, *Monopoly, Quality and Regulation*, 6 Bell J. Econ. 417, 417-22 (1975) and Tirole, *The Theory of Industrial Organization* 100-104 (1988).

⁶⁸ We observe elsewhere that the analysis is somewhat different with respect to contract terms, whose cost to the seller is not affected by buyer types. *Supra* note --.

monopolist is that, in most cases, it lacks information about its customers' individual valuations. It may nevertheless attempt to capture more of the consumer surplus through price discrimination, and this may lead to the supply of inefficient quality.

If the monopolist cannot observe its customers' individual valuations, it might try to use variables related to their willingness to pay. For example, if lower-valuing buyers tend to buy fewer products (e.g. because of less wealth), the monopolist may charge a higher unit price for larger quantities (particularly if it can prevent resale). Another method is to offer a range of products, or products of different quality, in order to "smoke out" the higher-valuing buyers.⁶⁹ A monopolist seeking to maximize its profit may provide lower-than-competitive quality to all customers other than those who value quality the highest. By increasing the slope of the price-quality gradient offered relative to marginal cost, this strategy separates customers according to their preference for quality, in order to discriminate in pricing of quality and reduce the consumer surplus.⁷⁰ This may be done by offering a menu of contract options.

Whether the discrimination is by product quality or contract terms, the lower-valuing customers may receive suboptimal quality.⁷¹ In fact, under some conditions, the monopolist may maximize its profits by foregoing the lower-valuing customers altogether, in order to extract the surplus from the high-demand buyers. For example, a monopolist might discriminate by offering its product with limited warranty and giving each buyer an option to purchase additional warranty. By doing so, the monopolist can extract more surplus from those who place a higher value on extended warranty. Yet, buyers who value warranties less than others end up with an inefficiently limited warranty or complete disclaimer, in order to prevent the high-valuing buyers from pooling with them. The inefficiency may stem, for example, from inefficient allocation of the risk of defect in the product.⁷²

When the market is perfectly competitive and the buyers' heterogeneous preferences are unknown to sellers, a different kind of inefficiency can arise. An often-cited example is that of an insurance market.⁷³ Suppose the insurance buyers can be divided into two groups, one with a

⁶⁹ Tirole offers the example of auto manufacturers extracting the surplus from high-valuation consumers who value luxury and prestige. He notes that the profit margins on the top-of-the-line cars and optional equipment are generally higher than those on basic cars and equipment, suggesting the existence of quality premia. He also suggests that this may lead the monopolist to offer too many products. See Tirole, *supra* note --, at --.

⁷⁰ Michael Mussa and Sherwin Rosen, *Monopoly and Product Quality*, 18 J. Econ Theory 301 (1978). The authors assume that the monopolist seller knows the general distribution of tastes and demands in the market, but cannot distinguish among buyers prior to sale and cannot prevent resale in other markets. They also assume constant costs of producing a given quality and increasing marginal costs of higher quality items. See also Martin Gaynor, *What Do We Know about Competition and Quality in Health Care Markets?*, NBER Working Paper 12301 (2006) and David Besanko, Shabtai Donnenfeld, and Lawrence J. White, *Monopoly and Quality Distortion: Effects and Remedies*, 102 Q.J. Econ. 743 (1987).

⁷¹ Id. Stiglitz (1977). Sherwin Rosen and Andrew M. Rosenfield, *Ticket Pricing*, 40 J. Law & Econ. 351 (using example of intertemporal price discrimination of tickets to show that "catering to any subset of customer tastes in one class constrains the revenues that can be extracted from other groups in other classes.")

⁷² Another example may be found in the industry that is perhaps most notorious for its price discrimination, the airlines. The airlines restrict the flexibility to change or cancel in low-fare tickets in order to extract more of the surplus from business travelers. Although it would seem that an airline could provide this flexibility at a lower cost than its value to many leisure travelers, it might refrain from doing so to protect its ability to price discriminate.

⁷³ Michael Rothschild and Joseph Stiglitz, *Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information*, 90 Q.J. Econ 629 (1976).

high chance of suffering from an accident and the other whose accident probability is low. Apart from the differing chances of an accident, everything else is the same across the two groups, including the degree of risk aversion. Given that both groups are risk averse and assuming that the insurance sellers (companies) are risk neutral, the social welfare maximizing solution is to provide both groups of buyers with full insurance (without, for instance, deductibles or co-pay).

When the insurance market is perfectly competitive but the insurance companies do not observe each buyer's risk propensity (risk characteristic), the social welfare maximizing solution cannot be sustained. Suppose we start from the full insurance condition. A consequence of not being able to observe each consumer's risk propensity implies that the insurance premium cannot be individually tailored: both the high-risk and low-risk consumers will be paying an average premium. Also, given that the market is perfectly competitive, each company offering insurance will just break even. The average premium charged by the insurance companies will be just enough to cover the average expected payouts. Because the premium will be equal to the expected or average payouts to all, both high-risk and low-risk, buyers, however, from the buyers' perspective, there is an indirect subsidy from the low-risk consumers to the high-risk consumers. That is, the low-risk consumers are being charged a premium that is too high relative to their risk propensity while the high-risk consumers paying a premium that is too low: each company will make money from low-risk consumers while losing money to high-risk consumers.

When the companies and, also, the low-risk consumers realize this cross-subsidy, one of two things will happen. Either some companies will start offering less-than-full insurance (with positive deductible and/or co-pay) with lower premium just to attract the low-risk consumers or the low-risk consumers themselves, if they have the power to control the terms of the contract, will offer to share some of the risk in return for a lower premium. And given that the companies were initially making profit on selling full insurance to low-risk consumers, they can design such a contract so as to keep the high-risk consumers away while making both the companies and the low-risk consumers better off. The first phenomenon is often called "cream-skimming," in which companies skim the profitable segment of the market, while the second is called "inefficient signaling," in which the consumers signal their value to the market by taking costly (in this case, less-than-full insurance) action.

Of course, once the low-risk consumers have been skimmed away by some companies, the companies that are offering full insurance to high-risk consumers will realize that they are no longer breaking even, and the initial full insurance equilibrium will no longer be sustainable. If there is an equilibrium at all, it will be the one in which the low-risk consumers buy less than full insurance while the high-risk consumers purchase full insurance, and the companies selling insurance to either type will just break even by charging an actuarially fair premium.⁷⁴

For this type of "unraveling" to occur, at least three conditions seem important. First, the buyers in the market must have heterogeneous preferences and that preferences must be private information for the buyers. In the insurance market context, buyers had different risk propensities and that information was private. Second, buyer's differing preferences must affect not only the buyer's willingness-to-pay for quality but also the seller's cost of proving that

⁷⁴ See Albert Choi and Kathy Spier, Products Liability, *supra* note -- for a more in-depth analysis of products liability and conditions under which an equilibrium fails to exist.

quality to that specific buyer. In the insurance market, each buyer's risk propensity determines not only that buyer's willingness to pay a certain premium but also the seller's cost of providing insurance to that buyer. Even with the same payout amount, the high-risk buyer will be more costly to the insurance company than the low-risk buyer. This is particularly relevant for various non-price terms in contracts. Buyers may attach different values to different physical attributes of a product but the seller's cost of producing a certain physical attribute is usually invariant to the type of buyer consuming the product. In contrast, non-price contract terms, such as warranty, termination, or dispute resolution clauses, will not only command different willingness-to-pay from a buyer but will also impose different cost on the seller depending on the type of buyer that purchases the underlying product.

Third, the cream-skimming or the inefficient signaling result also depends on either the presence of many companies in the market (vigorous competition) or the buyer's ability to control or dictate the terms of the contract. In other words, the market is heavily skewed in favor of the buyers and they have all the bargaining power against the sellers. If, for some reason, there isn't as much competition among the sellers or the buyers' ability to control the terms of trade are restricted, one would suspect that the inefficiency result may be mitigated or even disappear. In fact, the distortions caused by either a monopolist or in a perfect competition seem to rely heavily on the condition that the market is very one-sided. And, yet, we do not yet have a very good idea on what may happen when the market is more even handed. In Part V, we attempt demonstrate how such distortions could disappear when the market conditions provide a more even playing field to contracting parties and, in the process, bridge the gap between the irrelevance proposition and the practitioners' understanding of the importance of bargaining power.

IV. Effect of Uneven Bargaining Power under Asymmetric Information

Suppose one seller and one buyer contract over the sale of a product. How much the buyer values the product (her reservation value or willingness-to-pay) and how much the product costs the seller to produce depends on two factors: buyer's "type" and product quality. Starting with quality, the higher the quality, the more costly it is for the seller to produce, but the higher the buyer's willingness-to-pay. For instance, if quality is represented by the warranty that comes with the product, a more extensive warranty will impose a higher cost on the seller but will also increase the maximum the buyer would be willing to pay for the product. Similarly, if the contract obligates the buyer to resolve dispute only in the seller's state (or grants the franchisor a broad termination right), such a restrictive forum selection (or a broad termination) clause will reduce both the seller's (the franchisor's) cost and the buyer's (the franchisee's) willingness-to-pay. A forum selection clause that restricts litigation to the seller's state (or a broad termination right) can also be thought of as providing low quality to the buyer (to the franchisee).

How much the buyer values quality and how much it costs the seller to produce a certain level of quality will also depend on various buyer-specific factors. A more extensive user will value an improvement in warranty more than a less-frequent user. A more frequent user will also impose a higher warranty repair cost on the seller. Similarly, a litigious buyer may place a higher value on the right to bring a law suit in its home jurisdiction and for the same reason, this right is more expensive for the seller to provide. Finally, a franchisee with whom the franchisor is more likely

to terminate the relationship will value restrictions on the franchisor’s termination right more than the franchisee who is likely to engage in a longer relationship with the franchisor. We aggregate these factors under the rubric of “buyer type”: type-1 buyers value the incremental quality of a given contractual provision more than type-2 buyers, and the cost to the seller of providing this provision is higher when the buyer is of type-1 than type-2.⁷⁵ We assume also that each buyer’s valuation of the incremental value of the contractual provision (for example, a warranty) is correlated with its respective valuations of the basic product.⁷⁶

To succinctly represent these ideas, let’s assume that the product can be manufactured at two different levels of quality: high or low. High quality product imposes a higher cost on the seller but also increases the buyer’s willingness-to-pay. In addition, the buyer can be of two different types, type-1 or type-2,⁷⁷ where the probability that the buyer is of type-1 is $\theta \in (0,1)$ and of type-2 is $1 - \theta$. For most of the analysis, we will assume that $\theta = 1/2$: each buyer type is equally likely. Both types of buyer value high quality more than low quality, but conditional on a quality level, type-1 buyer is willing to pay more for the product and it is also more costly for the seller to provide the quality for that type. We can think of type-1 buyer as the more frequent user of the product and type-2 buyer as the less frequent, casual user. Since the type-1 buyer is more likely to make a warranty claim, warranty is valued more by the type-1 buyer. At the same time, provision of any given level of warranty to the type-1 buyer is also more costly for the seller. The following table summarizes the monetized values and costs that depend on both buyer type and product quality.

	Type-1 Buyer		Type-2 Buyer	
Product Quality	Low	High	Low	High
Reservation Value	190	250	170	200
Production Cost	70	100	50	70
Surplus	\$120	\$150	\$120	\$130

Table 1: Production Costs and Reservation Values

Note, from the table, that when the quality of the product is low, e.g., warranty is limited, forum is restricted to seller’s state, or broader termination right to the franchisor, the type-1 buyer is willing to pay up to \$190 while the type-2 buyer is willing to pay up to \$170, for the product. For the seller, it costs \$70 to offer low quality to the type-1 buyer and \$50 to the type-2 buyer. The values and costs for the high-quality product (e.g., extensive warranty, no restriction on forum, or narrower termination right) are analogous.⁷⁸

⁷⁵ This is qualitatively similar to the story of how the true condition of a used car, known only to the seller, affects not only the seller’s reservation value but also how much the buyer is willing to pay for the car. See George Akerlof, *The Market for ‘Lemons’: Qualitative Uncertainty and the Market Mechanism*, 84 Q.J. Econ. 488 (1970).

⁷⁶ As mentioned earlier, it may be that type-1 buyer’s more frequent and intense use of the basic product leads it to value more both the product and the contractual warranty.

⁷⁷ Here we assume that there are two potential types of consumer while the seller type is fixed. This is done to simplify the analysis. The main implication of assuming no private information on the seller’s side is that when the buyer has all the bargaining power, the seller’s profit will be reduced to zero. This will not be true when the seller has all the bargaining power.

⁷⁸ By assumption, the type-1 buyer not only has a higher marginal willingness-to-pay (increase in reservation value of \$60 when switched from low quality to high quality, as opposed to \$30 for the type-2 buyer) but also higher absolute willingness-to-pay for quality (\$250 versus \$200 and \$190 versus \$170). Although the assumption may be

If we define social welfare as the buyer's willingness-to-pay minus the seller's cost, by assumption, the table implies that to maximize social welfare, the seller should provide high quality to both types of buyer.⁷⁹ By doing so, the surplus of \$150 is realized from the type-1 buyer and \$130 from the type-2. In expectation, the maximum expected social welfare is $\theta \times \$150 + (1 - \theta) \times \130 . When $\theta = 1/2$, this is equal to \$140. Finally, we assume that the buyer and seller realize zero utility and profit, respectively, if there is no sale. These are their respective outside reservation values.

A. The Irrelevance Proposition Under Complete Information

When both the buyer and the seller are fully informed of respective party's values and costs, regardless of the distribution of bargaining power, they will negotiate to achieve the surplus-maximizing result. They will choose the quality level to maximize the total surplus from the transaction while working out the bargaining issue through price. For example, suppose the seller has all the bargaining power. The seller, knowing which type of buyer she is selling the product to, will sell high quality product to both types of buyer but charge two different prices: \$250 to the type-1 and \$200 to the type-2.⁸⁰ By engaging in perfect price discrimination, the seller maximizes its expected profit by capturing all of the potential surplus: \$150 from the type-1 buyer and \$130 from the type-2 buyer for an expected profit of $\theta \times \$150 + (1 - \theta) \times \130 . Conversely, if the buyer has all the bargaining power, the type-1 buyer will offer to purchase high quality at \$100 and the type-2 buyer will offer \$70 for high quality. The expected buyer surplus will be equal to the maximum social welfare of $\theta \times \$150 + (1 - \theta) \times \130 . The only difference between these two polar cases will be the price at which the parties reach an agreement.

More generally, if we let $\lambda \in [0,1]$ denote the fraction of the surplus that the seller captures in equilibrium (or the seller's relative bargaining power vis-à-vis the buyer), while both types of buyer will purchase high quality product, the equilibrium price for the type-1 buyer is $\$100 + \lambda(\$150)$, and, for the type-2 buyer, $\$70 + \lambda(\$130)$. Note that as λ rises, so do the equilibrium prices. When $\lambda = 1$, denoting full bargaining power for the seller (or giving all the surplus to the seller), prices equal buyer type's respective willingness-to-pay. Similarly, when $\lambda = 0$ (when the buyer has all the bargaining power), the prices equal the seller's respective costs.

reasonable in many settings, if it does not hold, although the inefficiency result below will not change, it may be the case that the party with all the bargaining power might offer non-price terms that are either inefficiently high or inefficiently low.

⁷⁹ The assumption that a single level of quality (high quality in the example) maximizes the surplus from both types of buyer is not important but is used to simplify the analysis. In the appendix, we provide a model in which optimal qualities differ based on buyer type.

⁸⁰ To make sure that the buyer will make the purchase, the prices have to be slightly less than the buyer's reservation value, e.g., \$249.99 and \$199.99. This type of tie-breaking will be common throughout the numerical examples and for simplicity, we will assume that when the buyer (or the seller) is indifferent between buying and not buying (selling or not selling) the buyer will purchase (the seller will sell).

$\lambda \in [0,1]$	Type-1 Buyer	Type-2 Buyer
Equilibrium Product Quality	High	High
Equilibrium Price	$\$100 + \lambda(\$150)$	$\$70 + \lambda(\$130)$
Consumer Surplus	$(1 - \lambda)(\$150)$	$(1 - \lambda)(\$130)$
Producer Surplus	$\lambda(\$150)$	$\lambda(\$130)$
Total Surplus	$\$150$	$\$130$

Table 2: Equilibrium under Symmetric Information

This result yields the bargaining power irrelevance proposition under the strong assumption of complete and symmetrical information: irrespective of their relative bargaining power, contracting parties will always choose the efficient, surplus-maximizing non-price terms and work out the bargaining power issue only through price. As we will see in the next section, the combination of bargaining power and asymmetric information leads to inefficient non-price terms.

B. Private Information on Buyer Type

Suppose that the buyer knows how much she is willing to pay for quality (which type she is), but the seller does not: when the seller meets the buyer, the seller only knows that the buyer is type-1 with probability θ or type-2 with probability $1 - \theta$.⁸¹ Under this assumption, the allocation of bargaining power determines whether they will agree to an efficient quality of non-price term. As in the complete, symmetric information case, we first start with two polar cases: when either the seller or the buyer has all the bargaining power. We then turn to the more complicated examples of “even” distribution of bargaining power.⁸²

1. Dominant Seller

Suppose the seller has all the bargaining power. In this Part, we represent the bargaining power as the ability to make a take-it-or-leave-it offer to the buyer, without competition, which cannot be subsequently renegotiated. If the seller were to provide high quality to both types of buyer, the seller will not be able to charge two different prices for high quality, given that she does not

⁸¹ We assume that it is the seller, not the buyer, who lacks the relevant knowledge about the buyer’s preferences. This assumption seems realistic since, presumably, the buyer knows more about her preferences than the seller. We can flip the assumption and let the seller be aware of the buyer type while the buyer is ignorant of her preferences, but this will not change the qualitative results. In reality, private information will run on both sides: while the buyer would know more about her preferences she wouldn’t necessarily know much about the seller’s cost structure. We stay away from such complication to keep the analysis tractable.

⁸² The class of models we present in this section is known as bargaining games with private information. In these models, as soon as informed party’s private information is revealed to the uninformed party, there is an immediate agreement, or complete convergence of posterior beliefs. See John Kenan and Robert Wilson, *Bargaining with Private Information*, 31 J Econ Literature 45 (1993) for a survey of this class of bargaining games. Within the game theory literature, there is a different strand that analyzes bargaining with “non-convergent” priors, in which even after the revelation of informed party’s information, there is no immediate agreement about the state of the world, or no immediate convergence of players’ posterior beliefs. See, e.g., Muhamet Yildiz, *Bargaining Without a Common Prior—An Immediate Agreement Theorem*, 71 Econometrica 793 (2003). In those cases, whether or not the parties will agree immediately (whether or not there will be an inefficient delay in agreement) will depend a lot on how fast each player will be able to update his/her beliefs (e.g., how optimistic or pessimistic one remains after a communication). For the sake of tractability, we do not deal with this latter, important strand of literature.

know which type of buyer she is dealing with. Unless the price is so high to keep the type-2 buyer from purchasing at all ($p > \$200$), both types of buyer will simply choose the offer with the lower price. With that constraint,⁸³ the profit maximizing price the seller can offer for high quality and still be able to sell to both types of buyer is \$200. If the seller were to charge any higher price, the type-2 buyer will not buy, and lowering the price will only increase the buyer's surplus and reduce the seller's profit. With \$200, and when both types of buyer accept the offer, the seller's expected profit is $\$200 - \{\theta \times \$100 + (1 - \theta) \times \$70\}$. The seller will get \$200 for certain, and will incur an expected cost of $\theta \times \$100 + (1 - \theta) \times \70 . When $\theta = 1/2$, the expected cost is \$85 and the expected profit is \$115.

When the seller cannot identify the buyer type, the seller's ability to capture surplus from the type-1 buyer becomes limited. The problem with offering high quality to both types of buyer is that, although it is socially optimal, it is not profit-maximizing from the seller's point of view. At \$200 for high quality, the type-1 buyer realizes a surplus of \$50 and this represents a foregone opportunity (an opportunity cost) to the seller. Had the seller been able to identify the buyer type, she could have engaged in perfect price discrimination and earned an additional \$50 from the type-1 buyer. Due to the buyer's private information, even though the seller has all the bargaining power, the seller is letting the type-1 buyer to enjoy a significant amount of surplus.

When faced with such information obstacles, the seller can do better by making a menu of offers with different levels of quality. Suppose, instead of offering high quality at \$200, the seller makes the following menu of offers: $(p_1, q_1) = (\$230, h)$ and $(p_2, q_2) = (\$170, l)$. That is, the buyer is given a choice between purchasing high quality product at \$230 or low quality product at \$170. Each type of buyer, presented with such a choice, will choose whichever maximizes her surplus. For the type-2 buyer, since she is willing to pay only up to \$200 for high quality, the first offer is clearly unattractive. With respect to the second offer with low quality, given her willingness-to-pay of \$170 for low quality, she would be willing to choose that option, although her surplus from choosing that option will be wiped out. When p_2 is slightly below \$170, the type-2 buyer will choose the second option. What about for the type-1 buyer? If she were to accept the second offer, since she is willing to pay up to \$190 for low quality, she will realize a surplus of \$20. Similarly, if she were to accept the first offer, her surplus is also \$20. Again, when p_1 is slightly below \$230, type-1 buyer will choose the first option.

When the buyer type is thus separated, the seller will also enjoy a larger expected profit. Recall that when the seller was offering high quality to both types of buyer at \$200, the seller's expected profit was $\theta \times \$100 + (1 - \theta) \times \130 . The seller's expected profit, when the buyer type is separated through the menu, is $\theta \times (\$230 - \$100) + (1 - \theta) \times (\$170 - \$50) = \theta \times \$130 + (1 - \theta) \times \120 . Compared to the previous case, the seller is grabbing a higher fraction of the surplus from the type-1 buyer (\$130 versus \$100) while sacrificing some profit with

⁸³ If the proportion of high-value buyer is sufficiently high ($\theta > 13/18$), the seller might be able to increase its profit somewhat by providing a single contract that is attractive only to type-1 consumer: high-quality at a price of \$250. In our model, the monopolist is using both the price and non-price terms to screen buyers. Alan Schwartz suggests that when trade is uncertain ex post and the buyer is privately informed of the surplus, the monopolist may use the initial price and liquidated damages (down-payment) to screen buyer types. We can think of the liquidated damages, which is similar to warranty, as being the "non-price" term as in our model. See Alan Schwartz, *Price Discrimination with Contract Terms: The Lost-Volume Problem*, 12 Am. L. Econ. Rev. 394 (2010).

respect to the type-2 buyer (\$120 versus \$130). So long as the chances of facing the type-1 buyer are not too small, making such a tradeoff will make sense for the seller. When $\theta = 1/2$, for instance, the seller's expected profit will increase from \$115 to \$125. The following table compares the two outcomes.

$\theta = 1/2$	$(p, q) = (\$200, h)$	$(p_1, q_1) = (\$230, h)$ $(p_2, q_2) = (\$170, l)$
Type-1's Surplus	50	20
Type-2's Surplus	0	0
Seller's (Expected) Profit	115	125
Total (Expected) Surplus	140	135

Table 3: Equilibrium Comparison when Seller has All the Bargaining Power

An important point about the example is that, even though offering high quality to both types of buyer is socially optimal, the seller is deliberately choosing suboptimal quality for the type-2 buyer. Such reduction in quality stems from the seller's desire to exercise its bargaining power and maximize profit. When the seller can dictate the terms of the trade, the seller becomes the de facto residual claimant of the transaction. When the seller knew which type of buyer she was facing, she was able to capture all the contractual surplus by selling the same high quality product at two different prices. When the seller cannot engage in such perfect price discrimination due to lack information on buyer type, the seller is inclined to introduce inefficiency in the transaction by seeking to extract more of the buyer's rent. In the current example, by offering low quality product with a price that is sufficiently unattractive to the type-1 buyer (but attractive to the type-2 buyer), the seller can induce the buyer to "reveal" her type and is better able to reduce, albeit not completely, type-1 buyer's rent. In the process, however, contractual surplus for the type-2 buyer is inefficiently reduced.

Using the product warranty as an example, suppose we equate high quality as "extensive" warranty and low quality as "limited" warranty, and let the type-1 buyer as the frequent user of the product and the type-2 buyer as the infrequent user. When the seller was offering \$200 for the product with extensive warranty, the extensive user was enjoying a surplus of \$50, but both types of user were able to enjoy the socially optimal level of warranty. When the seller wants to maximize its profit, instead of offering the product with extensive warranty at \$200, the seller gives the buyer a choice: buyer can purchase the product with limited warranty at \$170, but by paying additional \$60, she can get an extensive warranty. With these choices, the casual user will not find it worthwhile to pay \$60 to obtain the extensive warranty while the extensive user will. The seller will increase its expected profit from \$115 to \$125 and reduce the type-1 buyer's surplus from \$50 to \$20, but the type-2 buyer will be stuck with an inefficiently limited warranty.

The fact that the seller's bargaining power is playing an important role can also be demonstrated using the following thought experiment. Suppose, due perhaps to regulation, that the seller cannot charge more than \$210 for the high quality product. Because of this cap, if the seller were to price-quality discriminate, the seller will have to leave a larger surplus for the type-1 buyer. At the same time, because the seller's power of extracting surplus from the buyer is more limited, it also reduces the seller's incentive to introduce inefficiency to the type-2 buyer. To see this, if the seller were to offer two different contracts to separate the types, the seller will now

offer $(p_1, q_1) = (\$210, h)$ and $(p_2, q_2) = (\$170, l)$. Because of the limit on the seller's bargaining power, seller's expected profit is reduced to \$115, which is no higher than the profit the seller could generate by offering both types high quality at \$200. If the price ceiling is between \$200 and \$210, the seller no longer has any incentive to engage in price-quality discrimination. This example demonstrates that the incentive to produce quality distortion depends crucially on the party's ability to extract surplus from the other – in other words, its relative bargaining power.

2. Dominant Buyer

The quality distortion in the previous example resulted from the seller's desire to minimize the buyer's rent and it is natural to ask whether shifting bargaining power to the buyer would correct the distortion. Unfortunately, however, fully empowering the buyer introduces a different kind of distortion to the transaction. We turn to the case in which the buyer has all the bargaining power and allow the buyer to make a take-it-or-leave-it offer (without competition from other buyers or an opportunity to renegotiate) to the seller.⁸⁴ Given the parameters in our example, letting the buyer make a take-it-or-leave-it offer is equivalent to having perfect competition in the market, in which a large number of sellers make offers and the fully-informed buyers choose the most attractive among them.⁸⁵

When the buyer has all the bargaining power, the seller's equilibrium profit will be reduced to zero (in expectation). This result is in contrast from the previous case where the seller, with full bargaining power, was unable to completely eliminate the type-1 buyer's surplus. The reason for the difference stems from the assumption that while the buyer has private information about her preferences, the seller does not. There is no seller "type" that is kept hidden from the buyer in our analysis. When the buyer has all the bargaining power, the buyer will be able to, in equilibrium, capture the entire surplus from the transaction. If social welfare were to be maximized, both types of buyer should offer to purchase high quality at a price equal to the average cost of production: $p = \theta \times \$100 + (1 - \theta) \times \70 , which is equal to \$85 when $\theta = 1/2$.

The problem with this solution, however, is that the type-1 buyer is receiving a great benefit by paying a price that lies below the production cost ($p < \$100$) while type-2 buyer is paying a price higher than the production cost ($p > \$70$). The type-2 buyer type indirectly subsidizes the type-1 buyer, and the type-1 buyer captures more than the surplus from the transaction ($\$250 - p > \150) while type-2 buyer gets less ($\$200 - p < \130). Using the warranty example, when the seller offers the product with an extensive warranty at a single price (which may equal to the average cost of servicing both types under the warranty), the infrequent users will be subsidizing

⁸⁴ The problem of inefficient quality to some segment of consumers, in that case, is often noted as that of "cream-skimming," rather than "inefficient signaling." See, e.g., Michael Rothschild and Joseph Stiglitz, *Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information*, 90 Q. J. Econ 629 (1976) and Albert Choi and Kathy Spier, *Should Consumers be Permitted to Waive Products Liability? Product Safety, Private Contracts, and Adverse Selection*, University of Virginia Law School Working Paper (2010).

⁸⁵ Indeed, the theoretic approach of allowing the buyer to make a take-it-or-leave-it offer is not significant. Even if the seller still gets to make a take-it-or-leave-it offer, so long as there are multiple sellers and no entry barrier, the equilibrium presented below will hold.

the more frequent users of the product. Another example may be that of health insurance contracts. When an insurance company charges an identical premium (with imperfect screening) to both the healthy and the less healthy consumers, the healthy consumers will be subsidizing the less healthy.

Can the type-2 buyer somehow break this indirect subsidy and enjoy a larger surplus? The fact that the seller cannot identify buyer type and that the type-2 buyer is subsidizing the type-1 buyer implies that the type-2 buyer will have an incentive to make a differentiating offer that would make both her and the seller better off. Consider this deviation: instead of offering high quality at price equal to $\theta \times \$100 + (1 - \theta) \times \70 , suppose the type-2 buyer offers low quality at price \$51. If the seller were to accept this offer, knowing that this is coming from the type-2 buyer, the seller will realize a profit of \$1, as opposed to just breaking even. For type-2 buyer, making this (unilateral) deviation is better, since by doing so, she realizes a surplus of \$119, as opposed to \$115 (assuming $\theta = 1/2$).

When the type-2 buyer thus realizes that she is paying too high a price for the high quality product (due to indirect subsidy to the type-1 buyer), she has an incentive to separate herself to get a better deal. Of course, when the type-2 buyer thus deviates, the seller will no longer break even by serving only the type-1 buyer at the average cost price: $p = \theta \times \$100 + (1 - \theta) \times \70 . The initial (pooling) equilibrium will fall apart and the only possible equilibrium is for the type-1 buyer to offer $(p_1, q_1) = (\$100, h)$ and the type-2 buyer to offer $(p_2, q_2) = (\$50, l)$. The seller will break even when serving both types at the respective prices. The type-1 buyer would not want to mimic the type-2 buyer. If she were to do so, her surplus will only decrease from \$150 to \$140. Likewise, type-2 buyer would not want to mimic the type-1 buyer since that would reduce her surplus from \$120 to \$100. The following table summarizes the equilibrium results.

$\theta = 1/2$	$(p, q) = (\$85, h)$	$(p_1, q_1) = (\$100, h)$ $(p_2, q_2) = (\$50, l)$
Type-1's Surplus	165	150
Type-2's Surplus	115	120
Seller's (Expected) Profit	0	0
Total (Expected) Surplus	140	135

Table 4: Equilibrium Comparison when Buyer has All the Bargaining Power

When the buyer has all the bargaining power, the buyer will deliberately offer suboptimal contract so as to increase her gain. The reason stems from the bargaining power and the temptation to signal her type to the seller in return for a lower price. When the seller cannot distinguish between buyer types, the socially optimal equilibrium might force certain buyer types to subsidize by paying a higher price than justified by the production cost. When the buyer has all the bargaining power ($\lambda = 0$), because she is the de facto residual claimant, such a cross-type subsidy is a burden for her and she would have an incentive to engage in costly, but inefficient, signaling. As the buyer's bargaining strength decreases (λ gets higher), she would have less of an incentive to separate herself through inefficient signaling because she will not be able to capture the full benefit from doing so.

V. Effect of More Even Bargaining Power

In the previous two polar examples, the party with all the bargaining power deliberately imposes inefficient terms to capture more of the contractual surplus. In this section, we explore whether these terms would change if the bargaining power were more evenly distributed. We have viewed a competitive market as a case of buyer power, given that the buyer enjoys the entire surplus. In this light, what would constitute a more even allocation of bargaining power? We suggest three possibilities. First, a monopolist seller might face a threat of future competition if its contract terms are inefficient, but not otherwise. Second, the monopolist may be tempted to renegotiate after the initial sale, to profit from the surplus created by removing the inefficiency. We examine these cases in sections A and B, below. Third, in Section C, we present an analysis of bargaining in a bilateral monopoly, in which the parties may trade offers and counteroffers. In this game, bargaining power can be adjusted by varying the rate at which the payoffs from future agreements are discounted to the present.⁸⁶ In the Appendix, we present a more general model that does not rely on any specific bargaining protocol but does allow the mechanism designer (social planner) to implement the solution based on her preferences over buyer's and seller's welfare.

A. Threat of Competition

In this first variation, after the initial period of negotiation between the buyer and the seller, the seller (now called the incumbent) will face a competitor (called the entrant) in the market with some delay. The introduction of competition has two important implications. First, it will keep the incumbent's pricing power in check so that the incumbent will be unable to extract as much surplus from the buyer. Second, more importantly, competition will also diminish or eliminate the incumbent's incentive to impose inefficient non-price terms on the buyer. This is because an inefficient term offers a profit opportunity for the competition. When an entrant sees an inefficient term, recognizing that not all the potential surplus is being realized by the incumbent and the buyer, the entrant will compete with an efficient term and induce the buyer to breach the contract with the incumbent. The possibility of breach will make discrimination and imposing inefficient non-price terms more difficult for the incumbent.

To represent these ideas more formally, we take the previous seller take-it-or-leave-it offer game and turn it into a two period competition/entry game with delay. Initially ($t = 0$), the Nature determines the buyer type and only the buyer observes the type. In the first period ($t = 1$), the incumbent (previously, the seller), makes an offer to the buyer without knowing buyer type. As in the seller take-it-or-leave-it game, the incumbent can either make a single/pooling offer (\bar{p}, \bar{q}) , or a menu of offers, $((p_1, h), (p_2, l))$. The buyer either accepts or rejects the offer. After the buyer's action, the game moves to the second period ($t = 2$) with some delay. To represent

⁸⁶ In the complete, symmetric information case, reflecting more "even" share of bargaining power was fairly straight-forward and was done by adjusting the parameter $\lambda \in [0,1]$. In the presence of private information, this is not as straightforward, partly because the equilibrium tends to be sensitive to the structure of the bargaining process. Assumptions as to who gets to make an offer first, whether the offeree can make a counter offer, how much delay there is between offers can matter in determining the equilibrium of the game. This, in turn, makes it more difficult to make a strong generalization about the effect of bargaining power on non-price terms. The following three variations, therefore, are meant to illustrate the main ideas of how deviations from the simple take-it-or-leave-it offer bargaining models can reduce or eliminate the inefficiency.

delay, we use a discount rate of $\delta \in [0,1]$. If any of the contractual surplus is realized in the second period, rather than in the first, all payoffs that come from the second period surplus are multiplied (“discounted”) by δ . A higher δ implies that the second period payoff is less discounted vis-à-vis the first period payoff and this provides less of an incentive for the players to reach an agreement in the first period. Similarly, when δ is low, the players will have a stronger incentive to reach an agreement in the first period.

When $\delta = 1$, as an extreme case, the parties are indifferent between realizing a payoff in the first or in the second period. There is no cost in delay and the buyer would be happy to simply wait until an entrant appears in the market, making the game identical to the one in which the buyer was able to make a take-it-or-leave-it offer to the seller. That is, with a higher δ , there is more robust competition between the incumbent and the entrant. If $\delta = 0$, on the other extreme, having the option of being able to wait for the second period becomes useless. The players must reach an agreement in the first period if they were to realize any surplus, making the game identical to the one in which the seller was able to make a take-it-or-leave-it offer. With a lower δ , potential competition in the second period means less to the buyer and the incumbent has a stronger upper hand vis-à-vis the entrant. The discount factor δ , hence, also determines the degree of competition between the two entities.

In the second period ($t = 2$), a competitor (the entrant) appears in the market. If the buyer rejected the incumbent’s offer in the first period, the incumbent and the entrant will make competing offers to the buyer in the second period. Buyer’s rejection of the incumbent’s offer in the first period implies that the buyer’s type remains unknown to both the incumbent and the entrant.⁸⁷ When two sellers thus compete for a single buyer whose type is unknown, the unique Nash equilibrium is for both sellers to make a menu of offers:

$((p_1, h), (p_2, l)) = ((\$100, h), (\$50, l))$. The equilibrium will be identical to the one in which the buyer was making a take-it-or-leave-it offer to the seller. With only two types of buyer, competition among two sellers is strong enough to create a perfectly competitive equilibrium.

If the buyer accepted the incumbent’s offer in the first period, how the entrant’s appearance in the market will affect the equilibrium depends on the efficiency of the incumbent’s non-price term. When the incumbent’s non-price term is efficient, since all the potential surplus is being realized by the incumbent and the buyer, the entrant cannot offer any set of terms to successfully lure the buyer away from the incumbent. Hence, the initial contract between the incumbent and the buyer will stand. When the incumbent’s non-price term is inefficient, on the other hand, the entrant can successfully induce the buyer breach the initial contract by offering an efficient non-price term. Even if the buyer has to pay the incumbent expectation damages,⁸⁸ the presence of a

⁸⁷ It is also possible that only one type of buyer accepts the offer while the other does not. This will reveal the buyer’s type to the incumbent and the entrant. This type of separation is dealt with through refinements, which, due to its complexity, are not dealt with in detail. The equilibria presented in all three variations are constructed to survive the refinements.

⁸⁸ The optimal response by the incumbent, when faced with entry, is to set liquidated damages at an amount higher than the expectation damages. This will allow the incumbent to extract more rent from the buyer-entrant duo. See Philippe Aghion and Patrick Bolton, *Contracts as Barrier to Entry*, 77 Am. Econ. Rev. 388 (1987). Even if we were to assume that the court will honor such a penalty clause, when all three parties are aware of the relevant values, which is the result when the buyer separates based on type, setting inefficiently high liquidated damages will not

residual surplus implies that the entrant can still make both the buyer and itself better off through breach.

For instance, suppose the incumbent makes a menu of offers to the buyer in the first period, $((p_1, h), (p_2, l))$, and the buyer self-selects depending on her type. In the second period, the entrant, knowing that the type-2 buyer has chosen the low quality contract, will selectively offer a high quality contract to the type-2 buyer. Since there is a \$10 of residual surplus from switching the type-2 buyer from low quality to high quality (surplus of \$130 versus \$120), even when the type-2 buyer has to pay expectation damages of $p_2 - 50$ to the incumbent, there still is enough to make both the entrant and the type-2 buyer better off. When the entrant thus attempts to induce the type-2 buyer to breach the initial contract, the incumbent will respond by also offering high quality to the type-2 buyer.⁸⁹ The result will be that the type-2 buyer will be able to obtain high quality product at a price of \$70 and capture all the residual surplus of \$10 while the incumbent's profit remains at $p_2 - 50$.

Figure 1 represents the potential outcomes of such a competition/entry game.⁹⁰ After Nature makes its selection (at the top of the tree), the incumbent (Seller) makes an offer to the buyer which the buyer either accepts or rejects. The bottom numbers represent the (expected) surplus captured by the buyer and the incumbent, respectively. For simplicity, the (potential) payoffs to the entrant are not shown, and the second period actions are folded into the payoffs. The dashed curve represents the fact that when the incumbent is making the first period offer, the incumbent does not know which node she is at, i.e., she does not know the buyer type.

First, note that when the buyer rejects the initial offer from the incumbent (represented by branches with "Reject" written next to them), the competition between the incumbent and the entrant in the second period ensures that the buyer captures all the surplus. The type-1 buyer will realize a surplus of 150 (multiplied by δ due to delay) while the type-2 buyer will realize a surplus of 120 (multiplied by δ). Second, when the incumbent induces the type-2 buyer to accept low quality in the first period (represented by the "Accept" branch that follows the menu of offers for the type-2 buyer), both the entrant and the incumbent will offer high quality to the type-2 buyer in the second period and induce the type-2 buyer to breach (or anticipatorily repudiate) the initial contract. The type-2 buyer will switch to the high quality contract while paying the expectation damages of $p_2 - 50$. The type-2 buyer, in the process will capture the

prevent the type-2 buyer from obtaining high quality in the second period when the incumbent cannot commit not to renegotiate the liquidated damages clause.

⁸⁹ When the incumbent himself offers the high quality contract in the second period, this will lead to a modification or a renegotiation of the initial contract. We'll analyze the renegotiation possibilities in more detail through the third variation. So, for the sake of distinction, it might be easier to suppose that the type-2 buyer will breach the initial contract with the incumbent and purchase high quality from the entrant at \$70.

⁹⁰ Note that the diagram already partially reflects both pooling and separating equilibria of the game. It is not the usual extensive tree form representation of the game. This will be true for all the tree diagrams in the paper. In a true extensive tree representation of the game, for each action by the buyer, the seller will form a belief that assigns probabilities of $\sigma \in [0,1]$ on the buyer being type-1 and $1 - \sigma$ of being type-2. The equilibrium concept we are using here is known as Perfect Bayesian-Nash Equilibrium (PBE). See Robert Gibbons, *Game Theory for Applied Economists* (1992) for an easy exposition of this equilibrium concept. We also apply Cho-Kreps "intuitive criterion" to rule out any unreasonable off-the-equilibrium belief. See In-Koo Cho and David Kreps, *Signaling Games and Stable Equilibria*, 102 Q.J. Econ. 179 (1987). The intuitive criterion will also play an important role in the third variation in Part V.C.

residual surplus of 10 (multiplied by δ to represent delay) while the incumbent's profit stays at $p_2 - 50$.

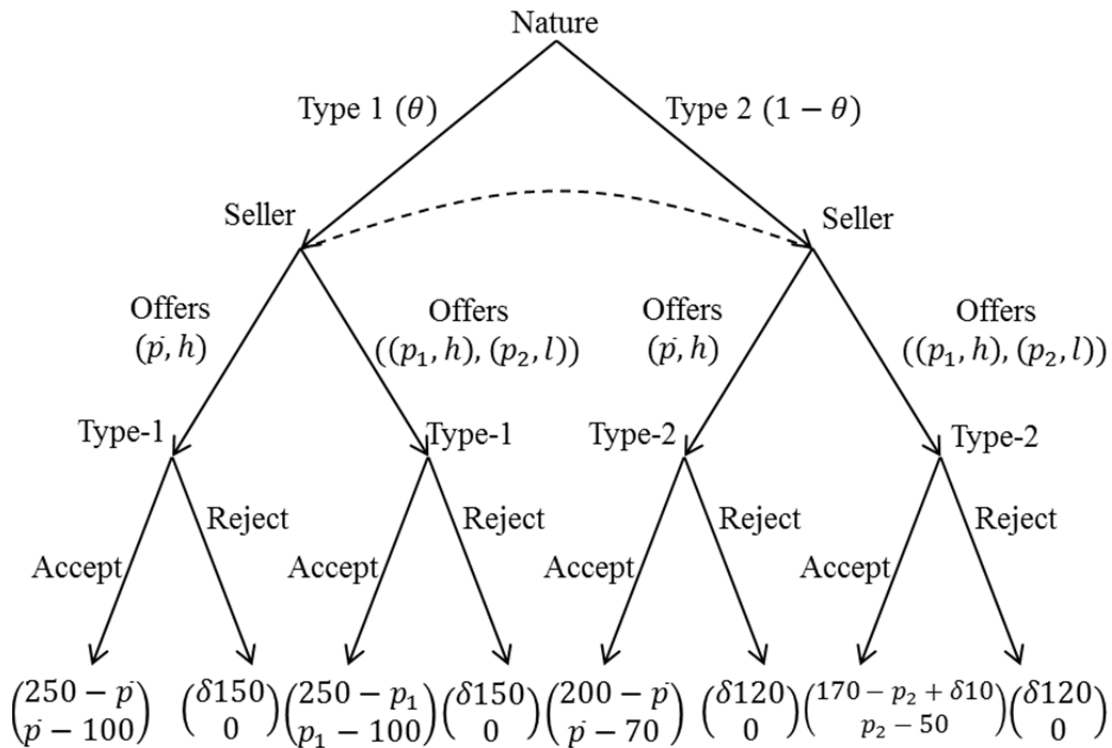


Figure 1: Competition/Entry Game with Breach

What will be the equilibrium of this competition/entry game? In short, the threat of having to face a competitor in the second period induces the incumbent to both lower the offer price and not impose an inefficient non-price term on the type-2 buyer. When $\delta = 0.5$, for instance, the unique equilibrium is for the incumbent to make a pooling offer of $(\bar{p}, \bar{q}) = (\$140, h)$ and for both types of buyer to accept the offer in the first period. The equilibrium price is substantially lower than the type-2 buyer's willingness-to-pay for high quality (\$200). The type-1 buyer will realize a surplus of \$110 and the type-2 buyer will realize a surplus of \$60. The incumbent, when $\theta = 1/2$, will realize an expected surplus of \$55. When compared to the game where the incumbent was able to make a take-it-or-leave-it offer to the buyer, even though the game ends in the first period, the buyer enjoys both a larger surplus and efficient non-price terms. Table 5 summarizes the outcome of the game when $\delta = 0.5$.

$\theta = 1/2$	$(\bar{p}, \bar{q}) = (\$140, h)$
Type-1 Buyer's Surplus	\$110
Type-2 Buyer's Surplus	\$60
Seller's Profit	\$55
Total (Expected) Surplus	\$140

Table 5: Equilibrium of Competition/Entry Game when $\delta = 0.5$

The reason why the incumbent offers a lower price to the buyer is fairly straightforward. When the buyer knows that there will be competition among two sellers in the second period, the buyer becomes unwilling to accept a high price offer in the first period. The type-1 buyer, for instance, knows that if she were to wait until the second period, she will be able to obtain high quality at a price of \$100 and realize a surplus of \$150. Delay imposes some cost, so that the surplus of \$150 from the second period, when $\delta = 0.5$, is equivalent to an immediate, first period surplus of \$75. For the type-1 buyer to accept the high quality offer from the incumbent in the first period, given that the type-1 buyer is willing to pay up to \$250 for high quality, the price must be \$175 or lower. Since the incumbent, when endowed with the power to make a take-it-or-leave-it offer without competition, was offering \$230 to the type-1 buyer, the type-1 buyer is already enjoying an additional (potential) surplus of \$55. A similar logic also applies to the type-2 buyer.

What is more interesting and somewhat less intuitive is (1) why the incumbent is disinclined to offer low quality to the type-2 buyer and (2) why the type-2 buyer is unwilling to signal its type to the market by rejecting the incumbent's pooling offer. To better understand the underlying logic, let's, for the moment, assume that the incumbent still makes a menu of alternatives to the buyer, $((p_1, h), (p_2, l))$, designed to induce the type-1 buyer to choose high quality and the type-2 buyer to choose low quality. When the incumbent was able to make a take-it-or-leave-it offer to the buyer, the incumbent only had to make sure that the terms of the low quality contract that the *incumbent* offers was sufficiently unattractive to the type-1 buyer. This constraint was satisfied when the prices were chosen to satisfy $\$250 - p_1 \geq \$190 - p_2$. With the threat of competition, the incumbent now also needs to worry about the *entrant's* offer to the type-2 buyer in the second period.

Competition in the second period means that even if the type-2 buyer had chosen low quality in the first period, the type-2 buyer will still be able to obtain high quality through breach when an entrant emerges. What is interesting is that this will not only improve the welfare of the type-2 buyer, but, more importantly, will also lessen the incentive of the type-1 buyer to stay with the high quality contract in the first period. The type-1 buyer now realizes that choosing the low quality contract does not necessarily mean she will be stuck with low quality. Rationally and correctly expecting that the price of high quality offered to the type-2 buyer will be quite attractive in the second period (due to competition), the type-1 buyer is less inclined to choose high quality at a relatively high price in the first period. If the incumbent still wants to separate the buyer types, therefore, the incumbent will have to give a larger price concession to the type-1 buyer, and a large price concession makes discrimination less attractive. When the market becomes more competitive (when δ rises), discrimination becomes even less attractive from the incumbent's perspective.

When the market gets too competitive (when δ is too close to 1), however, although the incumbent would want to offer high quality to both types of buyer, the buyer, particularly the type-2 buyer, would no longer want to choose high quality. As δ gets larger, the incumbent's high-quality, pooling offer gets closer to the expected cost of serving both buyer types (\$85 when $\theta = 0.5$), and the type-2 buyer, knowing that she is indirectly subsidizing the type-1 buyer, will have a stronger incentive to signal its type to the market. With too much competition (δ close to 1), the pooling equilibrium will break apart and the market will revert back to an equilibrium that is similar to the one in which the buyer was able to make a take-it-or-leave-it offer to the seller:

the type-1 buyer acquires high quality at a price close to the cost of serving that type while the type-2 buyer receive low quality at price corresponding to its cost.⁹¹ For the pooling equilibrium to be sustained, therefore, maintaining a moderate level of competition (δ in the middle range) is important.

B. Renegotiation

In the previous two variations, bargaining power was more evenly distributed by either allowing for some competition or by giving both parties some leverage in determining the terms of the contract. Another important source of bargaining power is the power not to renegotiate or modify the terms. When one party is endowed with the power to make a take-it-or-leave-it offer, the offeror has an incentive to deliberately introduce inefficiency in the hopes of capturing a larger share of the surplus. The presence of such inefficiency, however, implies that, if the bargaining parties have a chance to renegotiate the terms, they would be willing to make a Pareto-welfare improving modification. The ability to extract the maximal share of surplus through deliberate introduction of inefficiency is sensitive to the assumption that the party with bargaining power could commit not to renegotiate the terms that are previously agreed upon.

An important aspect about renegotiation is that such possibility is particularly salient and relevant to contract terms, such as warranty, termination, choice-of-forum clauses, rather than other aspects of the transaction, such as the product's physical attributes. It may be fairly easy for the parties to renegotiate over such contract terms either before or even after the product has been sold. On the other hand, physical attributes of a product tend to be much more immutable: once the seller has decided on the physical attributes, for instance before introducing the product to the market, or once the product has been sold to the buyer, it will often be impossible to change the attributes.

If the contracting parties cannot commit not to renegotiate the terms, this will introduce two important modifications to the one-period take-it-or-leave-it offer models. First, since the parties will voluntarily renegotiate the terms when the non-price terms are inefficient, such renegotiation will mitigate the inefficiency. In equilibrium, the parties are more likely to adopt the efficient non-price terms (either at initial formation or through renegotiation). Second, even when only one party has all the power to make offers, both in the initial formation and the renegotiation stages, the lack of commitment implies that a bigger share of the surplus will have to be shared with the counter party because it makes the initial discrimination more difficult.

To understand these points more clearly, let us go back to the example where the seller had the power to make a one-time take-it-or-leave-it offer to the buyer. When the seller could commit not to renegotiate the terms, the seller was able to separate the buyer types and extract the maximal surplus from the buyer. Once the buyer types self-select, on the other hand, the buyer

⁹¹ What we mean by the pooling equilibrium no longer being sustained is that the pooling equilibrium, in which both types of buyer acquire high quality at a single price, is that the equilibrium no longer satisfies Cho-Kreps "intuitive criterion." See supra note --. With a large δ , only the type-2 buyer will have an incentive to reject the incumbent's offer, and the market (the incumbent and the entrant) correctly believes that it is the type-2 buyer that rejects the incumbent's offer. There is some welfare loss, since the type-2 buyer will have to wait until the second period to consummate the transaction. As δ approaches one, this equilibrium converges to the Nash equilibrium in which the buyer was making a take-it-or-leave-it offer to the seller.

type is revealed to the seller: the seller knows for certain which type has accepted which offer. In the one-shot game, even after knowing the buyer type, the full commitment implied that the parties will go ahead and execute the inefficient, low quality contract with respect to type-2 buyer.

If the seller cannot commit not to renegotiate the terms, on the other hand, when the type-2 buyer accepts the offer with low quality, the seller will attempt to renegotiate the terms so as to realize a bigger surplus. After all, the fact that the contract contains an inefficient term implies that there is a residual surplus that can be captured through renegotiation. Although this will be better for both the seller and the type-2 buyer, when the type-1 buyer expects that the seller will renegotiate the low quality contract, the type-1 buyer may no longer have an incentive to stay with the high quality contract. The type-1 buyer now may want to mimic to be the type-2 buyer by choosing the low quality contract in the first stage, hoping that she will be able to get the high quality, through renegotiation, at a lower price. To achieve separation, the seller will have to leave a larger surplus to the type-1 buyer. Contractual surplus will be more evenly shared with the buyer even though the seller is the only one making offers.

To present these ideas more formally, suppose, as in the previous two variations, we have a two-period bargaining game with delay but with only the seller making the offer in both periods. Like before, at $t = 0$, the nature selects the buyer type, and in the first period ($t = 1$), the seller makes an offer to the buyer. If the buyer rejects the game moves to the second period ($t = 2$) with delay (discount factor δ), where the seller gets the second chance to make an offer to the buyer. An important deviation from the alternate offer game is that, even if the buyer accepts the first period offer, the game still moves to the second period, in which, the seller can offer to renegotiate the contract. Since there already is an agreement, for renegotiation to be successful, the seller will have to make sure that both parties will get more through the renegotiated contract than what they are entitled to receive under the initial contract. The following diagram represents the possible scenarios of the game. The most important deviation from the previous games is noted by the branch that represents renegotiation.

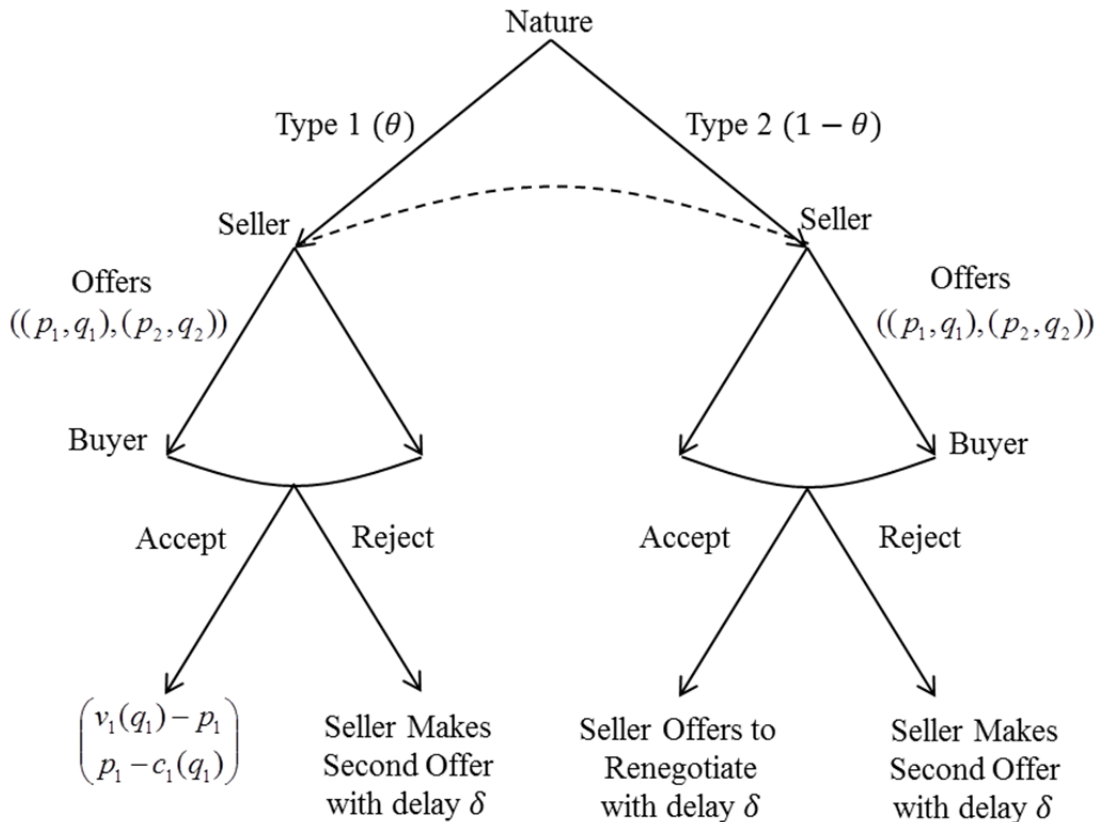


Figure 2: Possible Scenarios of the Renegotiation Game

To construct an equilibrium of this game, let's first hypothesize that, in the first period, the seller makes a menu of offers, $((p_1, h), (p_2, l))$, to the buyer and the buyer self-selects (and accepts) in accordance with her type.⁹² In the second period, with respect to the type-1 buyer, since high quality has been agreed upon, the seller knows that there is no gain from renegotiation. With respect to the type-2 buyer, on the other hand, since the buyer has agreed to purchase low quality (i.e., has accepted (p_2, l)) in the first period, the seller knows that there is a surplus from renegotiation. Under the initial agreement, the type-2 buyer expects to realize a surplus of $\$170 - p_2$ and the seller expects to realize a profit of $p_2 - \$50$. Since selling high-quality product to the type-2 buyer generates a larger surplus, the seller will offer to renegotiate the contract by making a renegotiation offer of $(\tilde{p}_2, \tilde{q}_2 = h)$ where $\$200 - \tilde{p}_2 \geq \$170 - p_2$, that is, the buyer's surplus from renegotiation must be at least as large as that from the initial contract. Having the power to dictate the terms of renegotiation, the seller will offer $\tilde{p}_2 = \$30 + p_2$ to the type-2 buyer in the second period.

Moving back to the first period, when the seller offers a menu of contracts, $((p_1, h), (p_2, l))$, the type-1 buyer knows that if she were to choose the contract with low quality, (p_2, l) , with the discount factor of δ , in the second period, the seller will make a renegotiation offer of (\tilde{p}_2, h) , where $\tilde{p}_2 \leq \$200$. So long as the price on the high quality product is higher than $\$200$, i.e.,

⁹² It is easy to show that whenever $\theta \geq 1/4$, offering a menu of contracts to the buyer is more profitable for the seller than making a pooling offer.

$p_1 \geq \$200$, choosing the second contract and waiting for the renegotiation becomes attractive. To prevent the type-1 buyer from doing so (and pooling with the type-2 buyer), the seller has to make a bigger concession on p_1 . That is, the seller has to ensure that $\$250 - p_1 \geq (1 - \delta) \times (\$190 - p_2) + \delta \times (\$250 - \tilde{p}_2)$. When $\delta = 0.8$, the profit-maximizing set of prices for the seller is $p_1 = \$206$, $p_2 = \$170$, and $\tilde{p}_2 = \$200$.⁹³ The following table summarizes the results.

$\theta = 1/2$	$((p_1, h), (p_2, l)) = ((\$206, h), (\$170, l))$ $(\tilde{p}_2, \tilde{q}_2) = (\$200, h)$
Type-1 Buyer's Surplus	\$44
Type-2 Buyer's Surplus	\$0
Seller's Profit	\$117
Total (Expected) Surplus	\$139

Table 6: Equilibrium When Seller Cannot Commit Not to Renegotiate ($\delta = 0.8$)

Compared to the game where the seller was able to make a one-time take-it-or-leave-it offer, by taking away the power of commitment not to renegotiate, both the total surplus and the type-1 buyer's surplus have increased: the total surplus from \$135 to \$139 and the type-1 buyer's surplus from \$20 to \$44. We can think of δ as being inversely related to the power of commitment. With a larger δ (a weaker commitment power), we can expect a bigger surplus for the buyer and larger efficiency while, with a smaller δ (a stronger commitment power), the equilibrium will produce a smaller surplus for the buyer and lower efficiency. Indeed, when $\delta = 1$, with the seller having no commitment power, the profit-maximizing strategy for the seller is to offer $(\$200, h)$ in the first period and serve both types of buyer. With no commitment power, inefficiency disappears. Conversely, when $\delta = 0$, we come back to the game in which the seller is able to make a one-time take-it-or-leave-it offer to the buyer, with maximal inefficiency.⁹⁴

C. Bilateral Negotiation

Another way of reducing the bargaining power is by allowing the offeree to make a counter offer, again, with some delay. Suppose, similar to the competition/entry game, the bargaining game

⁹³ This result is similar to what is known as the "Coasean dynamic" in the industrial organizations literature. Ronald Coase, in *Durability and Monopoly*, 15 J Law Econ 143 (1972), conjectured that if a durable goods monopolist cannot commit not to lower its price, the monopoly rent and the deadweight loss will disappear. This is because after selling to only a subset of consumers (with high reservation values) at a monopoly price, the monopolist will attempt to satisfy the residual demand (the consumers who value the good more than the cost of production but less than the initial monopoly price) by lowering its price. If the initial high-reservation-value consumers expect this, they will simply wait for the lower price. Our story is similar but different since we are more concerned about renegotiation of an existing contract, rather than forming new contracts with other sets of consumers. Nevertheless, in our game, the price of the high-quality product starts at \$206 and decreases to \$200 in the second period. See also Faruk Gul, Hugo Sonnenschein and Robert Wilson, *Foundations of Dynamic Monopoly and the Coase Conjecture*, 39 J Econ Theory 155 (1986) (showing that monopolist rent and deadweight disappear as the time interval between offers goes to zero).

⁹⁴ Note that in this renegotiation game, increasing δ (or reducing the seller's bargaining power) always increases efficiency. This is partly due to the fact that the seller still retains the power to make a take-it-or-leave-it offer in the renegotiation stage. If the buyer were making the renegotiation offer, increasing δ too much will create a signaling inefficiency. The model, then, will be qualitatively similar to the first and the third variations.

consists of two periods. But rather than having a competitor enter the market in the second period, suppose we let the buyer make a counter offer. In the first period ($t = 1$), the seller makes an offer to the buyer, which the buyer can either accept or reject. If the buyer accepts, the game ends on seller's proposed terms. If the buyer rejects, on the other hand, the game moves to the second period. In the second period ($t = 2$), the roles are reversed and the buyer gets to make an offer to the seller. If the seller accepts, the game ends on the buyer's proposed terms, whereas if the seller rejects, the game ends with no trade and both parties getting nothing.⁹⁵ Unlike the competition/entry game, however, the game moves to the second period only when an agreement has not been reached in the first period.

Similar to the competition/entry game, we assume that delay is costly for both players. Since the buyer has the last chance of making an offer, if the buyer were to make the second period offer immediately after rejecting the seller's offer, the game would collapse to the one that allows the buyer to make a take-it-or-leave-it offer to the seller. Similarly, if the buyer never gets to make an offer in the second period, the game will be identical to the one in which the seller was able to make a take-it-or-leave-it offer to the buyer. To keep the respective party's bargaining power in check, we multiply the payoffs from the second period by a discount factor of $\delta \in [0,1]$. As in the competition/entry game, the higher the δ , the less costly the delay in reaching an agreement (or the more patient the parties become) and the more bargaining power the buyer has. The discount factor plays the dual role of providing the parties an incentive to reach an agreement early and also distributing the bargaining power between the parties.⁹⁶

The following figure represents possible ways that the game could play out. As before, initially ($t = 0$), the Nature determines the buyer type. In the first period ($t = 1$), the seller makes an offer. Given that the seller does not know the buyer's type, the seller can either make a pooling offer, (\bar{p}, \bar{q}) , or a menu of offers, $((p_1, h), (p_2, l))$. If the seller were to choose the latter, the buyer can either reject the entire menu or choose one of the offers in the menu. If the buyer were to reject the offer, the game moves to the second period. In the second period, given that this is the last chance that the parties can reach an agreement and that the buyer has all the bargaining power, the buyer will make type-dependent offers that are identical to the ones the buyer used when the buyer could make a take-it-or-leave-it offer: $((\$100, h), (\$50, l))$.⁹⁷ In the figure, as

⁹⁵ We can reverse the roles and let the buyer make the initial offer and the seller the subsequent offer (with delay), but the substantive results will not change. There are (at least) two other ways of representing more "even" bargaining assumption. One is through a "flip-a-coin" mechanism, in which the outcome of a coin-flip will get to make a take-it-or-leave-it offer to the other party. In that game, however, no matter who becomes to be the offeror, the offeror will act as if she had all the bargaining power. Hence, the equilibrium will contain the inefficiencies that are identified in the previous models. The other is by allowing both parties to make simultaneous offers, i.e., by imposing a double auction mechanism. In that setting, when the buyer's bid price is larger than the seller's ask price, trade is executed at some price in between whereas if the buyer's bid price is lower than the seller's ask price, no trade takes place. See Kalyan Chatterjee and William Samuelson, *Bargaining under Incomplete Information*, 31 *Operations Research* 835 (1983). Although full bargaining solutions have not been worked out, yet, in that model, it is likely that the set of inefficient equilibria cannot be ruled out.

⁹⁶ Another way to think about δ is that it represents the probability that the seller is given a chance to make a counter-offer. If there is a chance that the consumer will simply walk out of the store when the seller rejects the consumer's offer in the first period, the seller's ability to make a counter-offer should be reduced by that probability.

⁹⁷ This results from refinement of the off-the-equilibrium beliefs. When $\delta \geq 5/6 \approx 0.83$, we can show that this will always be true. When the buyer rejects, as an off-the-equilibrium deviation, the offer of (\bar{p}, h) or $((p_1, h), (p_2, l))$, the seller correctly assigns probability θ to the possibility that the offer is coming from type-1 consumer. And,

before, the second period actions are folded into the payoffs for simplicity. The payoffs are discounted by δ in case the buyer rejects the seller's offer in the first period.

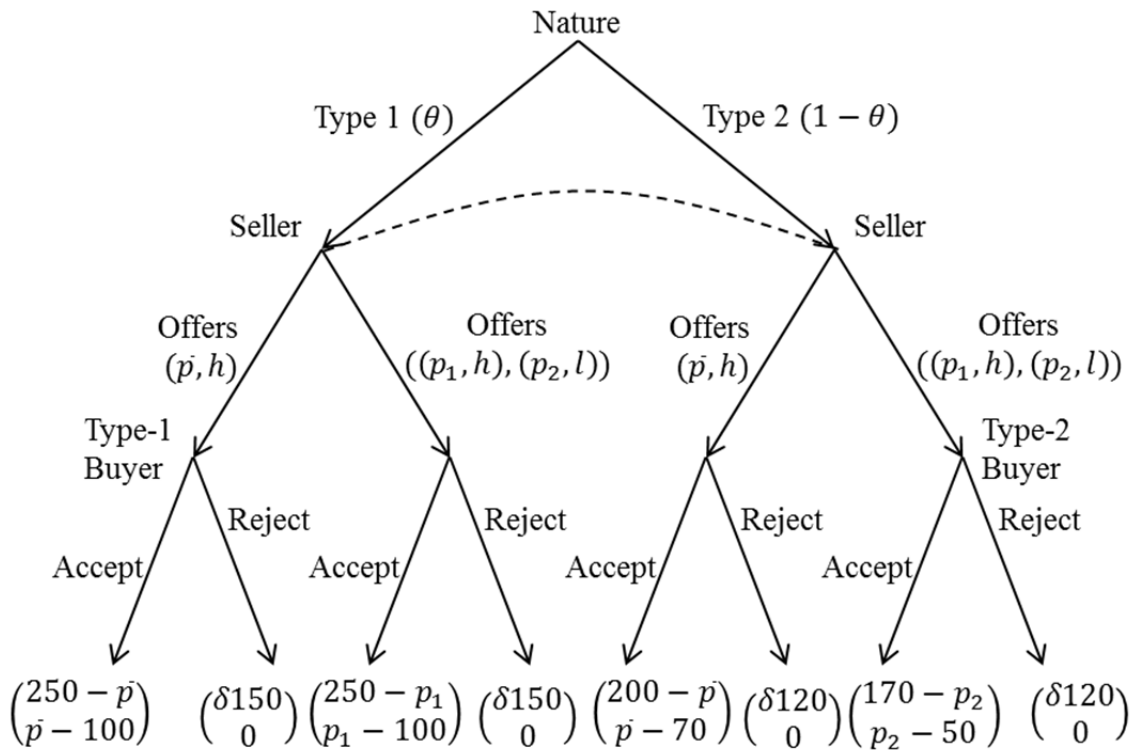


Figure 3: Possible Scenarios of the Alternate Offer Game

How will the equilibrium change from the one period game? Let's assume that $\delta = 0.9$. To construct an equilibrium, we move backwards and start from the second period. As we have noted, in the second period, assuming that the buyer has rejected the seller's offer in the first period, the buyer will behave as if she has the power to make a take-it-or-leave-it offer to the seller in a one-shot game: the type-1 buyer will offer $(\$100, h)$ while the type-2 buyer will offer $(\$50, l)$. The seller will accept both offers, rendering a surplus of $\$150$ to the type-1 buyer and $\$120$ to the type-2 buyer.

Moving back to the first period, whether or not the seller would want to make a pooling offer, $(\bar{p}, \bar{q}) = (\bar{p}, h)$, or give the buyer a menu of options, $((p_1, h), (p_2, l))$, she will have to ensure that the type-1 buyer will at least realize a surplus of $\delta \times (\$150)$ while the type-2 buyer will at least realize a surplus of $\delta \times (\$120)$. Furthermore, if she were to offer a menu, she has to further make sure that the type-1 buyer is better off choosing (p_1, h) rather than (p_2, l) , and the

therefore, knowing this, in the second period, the type-2 buyer will have to engage in signaling by offering low-quality. This out-of-the-equilibrium belief (by the seller) will satisfy Cho-Kreps "intuitive criterion." See supra note --. When $\delta < 5/6$, however, this will no longer be true. With respect to the pooling offer, (\bar{p}, h) , the seller will assign the probability of 1 that the rejection is coming from the type-2 buyer. Similarly, when the buyer rejects the menu of offers, $((p_1, h), (p_2, l))$, the seller will assign probably of 1 that the rejection is done by type-2 buyer when $\delta < 2/3$.

type-2 buyer is better off selecting (p_2, l) rather than (p_1, h) .⁹⁸ Under the first option, the best possible price the seller can offer for the high quality, when $\delta = 0.9$, is \$92. Under the second option, the optimal set of offers for the seller is $((\$113, h), (\$53, l))$. In both cases, the buyer will accept. The first, pooling offer, option will allow the seller to capture a surplus of \$7, while the second, a menu offer, option will allow the seller to realize a profit of \$3.5. Clearly, in equilibrium, the seller will choose to make a pooling offer of $(\$92, h)$ and the game will end in the first period without any inefficiency. The seller is better off since, had the game proceeded to the second period, the seller would have made no profit. The buyer is also better off since the buyer does not need to wait for the second period, i.e., there is no delay in contract formation.

$\theta = 1/2$	$(\bar{p}, \bar{q}) = (\$92, h)$
Type-1 Buyer's Surplus	\$158
Type-2 Buyer's Surplus	\$108
Seller's Profit	\$7
Total (Expected) Surplus	\$140

Table 7: Equilibrium When Parties Alternate in Offers ($\delta = 0.9$)

An important factor that determines the characteristics of the equilibrium is the discount factor δ . If $\delta = 0$, for instance, the buyer's ability to make an offer in the second period is of no consequence and the two-period bargaining game becomes equivalent to letting the seller make a take-it-or-leave-it offer. Similarly, if $\delta = 1$, there is no cost in delay in reaching an agreement (or the buyer gets to make a counter-offer for certain), and the buyer will fully exercise her right to make the last offer: the bargaining game becomes identical to the monopoly bargaining scenario.⁹⁹ As δ gets smaller, the buyer's last shot power becomes more diminished and the seller will be able to get a larger share of the surplus. So long as δ does not get too large or too small, the above pooling equilibrium can be sustained and the first best can be achieved.

One intuitive way of thinking about this bargaining game is by recognizing how much pricing restriction is being imposed by δ . Let's suppose that the parties are still playing the two-stage bargaining game but with complete and symmetric information over the buyer's type. In that scenario, as we have seen earlier, the parties will choose the optimal non-price terms to maximize the contractual surplus. At the same time, the assumption that the buyer can make a counter-offer only with some delay introduces an important check on the buyer's bargaining power.

To see this, with symmetric information, the buyer, in the second stage, will offer to purchase high quality product with prices of either \$100 or \$70, depending on her type. This allows the buyer to realize a respective profit of \$150 and \$130 in the second period. The seller, expecting this outcome from the second period, will offer, in the first period, respective prices that make the buyer just indifferent. To type-1 buyer, the seller will offer p_1 with high quality, such that $p_1 - \$100 \geq \delta \times \150 , while to type-2 buyer, the seller will offer p_2 such that $p_2 - \$70 \geq \delta \times$

⁹⁸ With the pooling offer, the seller must satisfy $\bar{p} \leq \min\{250 - \delta 150, 200 - \delta 120\}$. With the separating offer, the seller has to satisfy (1) $p_1 \leq 250 - \delta 150$; (2) $p_2 \leq 170 - \delta 120$; and (3) $p_1 - p_2 \leq 60$. Intuitively, having to satisfy a larger number of constraints, ceteris paribus, usually implies that the seller's profit will be lower.

⁹⁹ The previous two games (monopolist and perfect competition, or monopsonist, games) can be thought of as special cases of this more general game.

\$130. If we let $p_1 = \$100 + \delta \times \150 and $p_2 = \$70 + \delta \times \130 , which allow the seller to maximize her profit, we get $p_1 - p_2 = \$30 + \delta \times \20 . Note that as δ gets smaller, so does the difference between p_1 and p_2 . When $\delta = 1$, the buyer can fully extract all surplus from the seller as in the monopsony case. However, when $\delta < 1$, the buyer no longer has unlimited power in setting prices. And as the buyer's pricing power decreases, so does her incentive to impose inefficiency.

VI. Bargaining Power, Discrimination and Legal Policy

The motivation of this paper is to address what we identified at the outset as the irrelevance theory of bargaining power's effect on contract design. Our purpose is predominantly descriptive: how does bargaining power influence non-price terms? Along the way, we have commented on the efficiency of the outcomes under different power allocations and this naturally leads to the question of the role of the law in correcting bargaining or market inefficiencies. We believe that legal institutions are unlikely to have the information needed to mitigate these problems so that the cure may be worse than the disease.¹⁰⁰ Nevertheless, before concluding, we offer some observations as to the implications of our analysis on the policing of bargains under contract law.

Under the common law doctrine of unconscionability, a court may refuse to enforce an unconscionable contract term or the entire contract by either modifying or voiding them. The courts have required not only a defect in the bargaining process ("procedural unconscionability"), but also a term that is harsh or unreasonably unfavorable to the vulnerable party ("substantive unconscionability").¹⁰¹ While gross inequality of bargaining power is often mentioned as a factor contributing to procedural unconscionability, it is rarely sufficient on its own.¹⁰² Unless the imbalance amounts to duress, undue influence, or incapacity, the courts typically require further defect in bargaining, especially a finding that the weaker party also lacked the

¹⁰⁰ See Craswell, *supra* note --.

¹⁰¹ The terms "substantive unconscionability" and "procedural unconscionability" were originally coined by Arthur Leff. Arthur Leff, *Unconscionability and the Code—The Emperor's New Clause*, 115 U. Pa. L. Rev. 485 (1967). The formulation of the D.C. circuit in *Williams v. Walker-Thomas*, 350 F.2d 445, 449 (D.C. Cir. 1965) is often cited: "Unconscionability has generally been recognized to include an absence of meaningful choice on the part of one of the parties together with contract terms which are unreasonably favorable to the other party." In addition to noting the imbalance in bargaining power, the court also emphasized the fact that the terms were written on the back of the order form in fine print and in language that was difficult to understand.

¹⁰² Both the Restatement (Second) of Contracts and Article 2 of the Uniform Commercial Code adopted similar interpretations of the doctrine. According to the Restatement, while a "bargain is not unconscionable merely because the parties to it are unequal in bargaining position....gross inequality in bargaining power, together with terms unreasonably favorable to the stronger party." RESTATEMENT (SECOND) OF CONTRACTS § 208 cmt. d. Perhaps the high-water mark of the concern over the imbalance of bargaining power on its own was the famous case of *Henningsen v. Bloomfield Motors*, 161 A.2d 69 (N.J. 1960). The court struck down a warranty disclaimer that was not specifically brought to the attention of the consumer, but the main thrust of the court's opinion focused on the concentration of the automobile industry. *Id.* at 92. Since then, the occasional court has based a finding of procedural unconscionability on bargaining power. E.g., *Gianni Sport Ltd. V. Gantos, Inc.*, 391 N.W.2d 760 (Mich. App. 1986) (cancellation clause benefitting large retailer against small independent manufacturer was unconscionable); *Shell Oil Co. v. Marinello*, 307 A.2d 598 (N.J. 1973). However, most do not. Comment 1 to UCC 2-302 suggests that bargaining power is not by itself enough: "the principle is one of the prevention of oppression and unfair surprise and not of disturbance of allocation of risks because of superior bargaining power."

opportunity to read or understand the harsh term. Courts do not interfere with commercial contracts based solely on a procedural concern with unequal bargaining power.¹⁰³

When parties are rational and fully informed about the terms of their agreement, distributional concerns are less severe because at least each party is better off than without an agreement. While one could imagine a policy striving to achieve more even sharing of the surplus, another concern is with cases in which the exercise of bargaining power undermines value-creation. The analysis in Part IV demonstrates that inefficiently one-sided terms can persist even between sophisticated parties when the seller engages in screening or the buyer engages in signaling, particularly when bargaining power is unequal. This result underscores the current judicial and scholarly skepticism as to the earlier concern over adherence and the lack of meaningful choice is exaggerated. Indeed, it reveals that a menu of terms may itself be evidence of a problem. When a monopolist seller screens, it may impose harsh terms on one set of buyers (the low-value buyers) by, for example, disclaiming warranties to them while offering broad warranties to the other group (high-value buyers). If courts were to be more aggressive in policing bargaining power, they should be particularly vigilant when faced with a discriminating monopolist. Sometimes the monopolist's screening is obvious, in which case the court should scrutinize the non-price terms of the lower-quality contract: for example, a warranty disclaimer with an option to purchase an extended warranty.

Conversely, as Part IV demonstrates, the absence of bargaining power on the part of the seller does not resolve the danger. Inefficient signaling might occur in perfect competition. Of course, in cases in which the buyer has all the bargaining power (monopsonist), the low-value buyer may propose inefficient terms that are unfavorable to herself, to avoid being pooled with the high-value buyer.¹⁰⁴ If that were the case, since it is the buyer's exercise of bargaining power that is causing more seller-friendly terms, it will be difficult for the buyer to claim the sympathy of the court in a review for unconscionability. After all, the gains from the inefficient signaling accrue to the buyers rather than the competitor sellers. Therefore, mandatory terms might be a superior solution.

On the other hand, it is difficult to know what a court should do with such a contract. If the law compelled the monopolist to offer only a single contract (rather than a menu of contracts or options) in order to prevent inefficient screening, we observed earlier (and show in the more general model in the appendix) that this may not improve welfare in the face of heterogeneous preferences requiring different non-price terms. Alternatively, the court may establish a mandatory minimum quality and refuse to enforce anything less—for example, by prohibiting

¹⁰³ White and Summers, 4.3 at 135. See e.g., *Coursey v. Caterpillar, Inc.*, 64 F.3d 662 (6th Cir.1995) (“unconscionability is rarely found to exist in a commercial setting”); *County Asphalt, Inc., v. Lewis Wedding & Engineering Corp.*, 323 F.Supp. 1300 (SDNY 1970) (“it is the exceptional commercial setting where a claim of unconscionability will be allowed.”). But see *Campbell Soup Co. v. Wentz*, 172 F.2d 80, 93 (3d Cir. 1948) (refusing specific performance where the bargain was one-sided and oppressive).

¹⁰⁴ This result, derived from the numerical example in Part IV, is sensitive to the assumption on the buyer's relative reservation values. Throughout, we have assumed that the type-1 buyer not only had a higher marginal willingness-to-pay but also higher absolute willingness-to-pay for quality. If the type-2 buyer were to have a higher absolute reservation value vis-à-vis the type-1 buyer, when the buyer has all the bargaining power, the buyer will demand quality that is inefficiently high. See *supra* note --.

warranty disclaimers or requiring a period of notice before termination.¹⁰⁵ Of course, as others have argued, any attempt to mandate quality levels for specific classes of buyers must also deal with the informational limitations of the law-maker, whether regulator or court.¹⁰⁶

Even assuming that a court can set a floor at the optimal level for the buyer that values quality the least, however, the discriminating monopolist or a perfectly competitive market may still offer lower-than-optimal quality to intermediate classes with preferences between the lowest and highest or, perhaps even worse, may decide not to serve consumers who value quality the least. As a variation to the numerical example, if there are three types of buyers and three different levels of optimal quality, setting the minimum quality standard may improve the welfare for the consumer who values the quality the least, but it may not do anything for the middle consumer who also purchases inefficiently low quality product. If the quality minimum gets too high, the monopolist or the competitive market may decide not to serve the lowest-type consumer, thereby generating an even greater inefficiency.¹⁰⁷

Perhaps price regulation, an instrument that courts have been reluctant to invoke,¹⁰⁸ might be more effective: they might impose limits, both upper and lower, on price for the product. At least in theory, this can work because once the monopolist's incentive to extract consumer surplus (or buyers' incentive to engage in signaling) is kept in check, its desire to quality discriminate will disappear or at least be substantially mitigated. From the numerical example, if the monopolist is prevented from charging above \$220 for high quality product, it can no longer profit from inefficient price discrimination and will, instead, offer both types of buyer high quality at \$200. Also, if the minimum price of \$70 can be maintained when the buyer had all the bargaining power, type-2 buyer can no longer benefit by deliberately choosing low quality for the product. Price regulations, of course, immediately runs into the familiar challenge of institutional competence—particularly, identifying the proper limits in any given market.

These considerations suggest that a general structural policy to promote competition might be preferable to contract regulation.¹⁰⁹ Our analysis, however, demonstrates that shifting bargaining power to buyers may overshoot the objective if it gives buyers too much power. The policy of

¹⁰⁵ See Aghion and Hermalin, *supra* note --.

¹⁰⁶ The doctrine of unconscionability has been criticized on this score. See, e.g., Schwartz, *supra* note --; Craswell, *supra* note --. Another relevant critique is that the court's refusal to enforce one-sided non-price provisions will lead the stronger parties to extract their rents by raising the price, leaving the weaker party worse off than if the original contract had been enforced. See, e.g., Duncan Kennedy, *Distributive and Paternalist Motives in Contract and Tort Law, With Special Reference to Compulsory and Unequal Bargaining Power*, 41 Md. L. Rev. 563 (1982). We note, however, that this is not feasible in situations where monopolist is already maximally utilizing price terms to extract consumer rent, as in our numerical example. Since price term is more efficient in extracting rent, our result seems not unreasonable.

¹⁰⁷ See David Besanko, Shabtai Donnenfeld and Lawrence J. White, *Monopoly and Quality Distortion: Effects and Remedies*, 102 Q.J.Econ. 743 (1987) for demonstration of how minimum quality threshold (1) will leave consumers who desire moderate level of quality unaffected and (2) may induce the monopolist to stop serving consumers who desire low levels of quality all together.

¹⁰⁸ Courts seem to be reluctant to strike down price terms, at least partly because of the difficulty of determining the boundaries of "fair" prices in noncompetitive markets. Farnsworth notes two other possible reasons: (a) the price, being much more salient, is likely to be known and understood by the weaker party and (b) even if the contract price is struck down as being unconscionable (i.e., being outside the bounds of "fair" price), the court will be obliged in many cases to substitute a fair price in its place. E. Allan Farnsworth, *Contracts* (4th ed.) at §4.28.

¹⁰⁹ See, e.g., Schwartz, *supra* note --; Trebilcock, *supra* note --/

consumer empowerment in this sense may backfire. As was demonstrated through the numerical example, the buyers themselves may choose to create a signaling equilibrium that leaves some of them with inefficient quality when they are aware of the possibility of indirect subsidy to other buyers. This is true even in markets that would appear to courts as competitive, where the valuation of customers is private. The interior range of power allocation is golden in this context: a more even distribution of bargaining power and sharing of rents can mitigate the inefficiency. The mechanism to achieve this balance is an interesting question worthy of further investigation.

Conclusion

For over 40 years, law-and-economics scholarship has been working on the premise that bargaining power is irrelevant to the design of non-price contract terms. Practitioners have the opposite understanding and in contrast, give much weight to the balance of power, whether stemming from supply-and-demand imbalances, market concentration, or negotiating skill. This paper takes the first steps to bridge theory and practice by identifying the conditions under which bargaining power might affect contract design. We analyze at some length one set explanations: the effect of relative bargaining power where one party has private information about its reservation price. We also identify a variety of other possible explanations and leave to future research the further unpacking of the bargaining power irrelevance proposition.

Appendix: A General Model

Accurately capturing the notion of bargaining power in the presence of asymmetric information is difficult. In this setup, we take a more reduced form approach by letting λ denote the fraction of the equilibrium surplus the seller captures in expectation. Suppose the social planner (the mechanism designer) wants to maximize a social welfare function (the objective function), which is constructed on the weighted average of the buyer's and the seller's profit in expectation, subject to various constraints.

The constraints represent the fact that although the social planner can dictate the terms of the trade, she is still constrained by (1) the lack of information and (2) being unable to "force" both the seller and the buyer to participate. That is, although the buyer knows his type, the social planner does not observe buyer type and the social planner has to guarantee both the buyer and the seller at least zero profit, their respective outside reservation value. The social planner's problem can be written as follows:¹¹⁰

$$\begin{aligned} \text{Max}_{(p,q)} \lambda & \left(\theta(p_1 - c_1(q_1)) + (1 - \theta)(p_2 - c_2(q_2)) \right) \\ & + (1 - \lambda) \left(\theta(v_1(q_1) - p_1) + (1 - \theta)(v_2(q_2) - p_2) \right) \end{aligned}$$

subject to

$$\begin{aligned} p_1 - c_1(q_1) & \geq 0 \\ p_2 - c_2(q_2) & \geq 0 \\ v_1(q_1) - p_1 & \geq 0 \\ v_2(q_2) - p_2 & \geq 0 \\ v_1(q_1) - p_1 & \geq v_1(q_2) - p_2 \\ v_2(q_2) - p_2 & \geq v_2(q_1) - p_1 \end{aligned}$$

We will impose the usual assumptions of strictly diminishing marginal utility ($v'_i(q) > 0$ but $v''_i(q) < 0$) and (weakly) increasing marginal cost ($c'_i(q) > 0$ and $c''_i(q) \geq 0$). Furthermore, to make the problem more interesting, we will assume that the type-1 buyer's marginal utility is always higher than type-2's marginal utility ($v'_1(q) > v'_2(q)$), i.e., the single crossing property is satisfied, and that the cost of serving type-1 buyer is strictly higher than the cost of serving type-2 buyer: $c_1(q) > c_2(q) \forall q$. To ensure interior solutions, we'll also assume that $c_i(0) = 0$, $v_i > 0$, and $v'_i \gg 0$.

The objective (or social welfare) function is a weighted average of the seller's expected profit (weighted by λ) and the buyer's surplus (weighted by $1 - \lambda$). As λ gets larger, the equilibrium

¹¹⁰ The program assumes that, in equilibrium, the social planner will induce the buyer to choose different contract based on his type: $p_1 \neq p_2$ and $q_1 \neq q_2$. If this is not feasible, i.e., $p_1 = p_2$ or $q_1 = q_2$, then, we can re-write the program by defining $\hat{p} = \min(p_1, p_2)$ and $\hat{q} = \max(q_1, q_2)$ and letting the social planner to maximize the objective function subject only to the first four constraints, where the (p_i, q_i) is replaced by (\hat{p}, \hat{q}) . In theory, this formulation presents a possibility of replacing the first two constraints with $\theta(\hat{p} - c_1(\hat{q})) + (1 - \theta)(\hat{p} - c_2(\hat{q})) \geq 0$, thereby making the implementation problem easier, but we will ignore this possible relaxation.

will put more emphasis on the seller's profit and when λ is smaller, buyer's surplus becomes more important. The objective function can be re-written as $\theta((1 - \lambda)v_1(q_1) - \lambda c_1(q_1) + (2\lambda - 1)p_1) + (1 - \theta)((1 - \lambda)v_2(q_2) - \lambda c_2(q_2) + (2\lambda - 1)p_2)$. Three special cases are worth separate consideration. When $\lambda = 1/2$, the problem is equivalent to maximizing the conventional social surplus (or consumer surplus plus producer surplus, equally weighted). Note that when $\lambda = 1/2$, the price terms disappear from the objective function. When $\lambda = 1$, the problem is identical to that of a monopolist who, with the power to make a take-it-or-leave-it offer, tries to extract as much surplus as possible from the buyer and maximize its profit subject to satisfying the buyer constraints. When $\lambda = 0$, on the other hand, the buyer, for instance, by being able to make a take-it-or-leave-it offer to the seller, is maximizing her surplus subject to making sure that the seller at least breaks even.¹¹¹ When $\lambda \in (0,1)$, the bargaining power is distributed between the two parties.

Turning to the constraints, the first four constraints represent the seller's and the buyer's participation constraints, making sure that they, at least, realize zero surplus in equilibrium. As we will see shortly, in equilibrium, respective buyer type will receive different quality level product. The seller, therefore, must be able to break even for respective buyer type and each type of buyer should be able to realize more than her outside option, which is assumed to be zero. The last two constraints represent the buyer's incentive compatibility conditions: each type must (at least weakly) prefer to choose the contract that is intended for the type. Since the social planner does not observe buyer type, the social planner must offer a menu of contracts for the buyer to self-select.¹¹²

With these assumptions, in the first best, if the social planner were able to observe buyer type, regardless of the weight (λ) she assigns to the seller's profit, in equilibrium, the respective marginal utility will be equated with the marginal cost: $v'_i(q_i^*) = c'_i(q_i^*)$. Even if $\lambda = 1$, for instance, the social planner will still equate the marginal utility to the marginal cost but let $p_1 = v_1(q_1^*)$ and $p_2 = v_2(q_2^*)$. Similarly, when $\lambda = 0$, the social planner will choose the optimal

¹¹¹ We can also think of this model as representing a solution to Nash bargaining in which λ represents the seller's relative bargaining power. Under that interpretation, the parties bargain ex ante, without knowing the buyer type, but the bargaining solution must respect each party's ex post participation and, in particular, the buyer's incentive compatibility constraints. That is, even after they have worked out a solution, one or both of the parties can attempt to renegotiate when the solution does not give the party more than what the outside option or the other option dictates. Although it may be tempting to suggest that the equilibrium with $\lambda \in (0,1)$ can be replicated by "flipping a coin" that gives more (or less) chances to make a take-it-or-leave-it offer to the seller (or the consumer), this will not be true. The "flipping-the-coin" model will produce an equilibrium that will be a convex combination of two polar equilibria, and the inefficiencies at each pole may be simply averaged out without getting any closer to the optimum quality provision. The equilibrium produced under our setup will be different from such combination.

¹¹² Note that in our setup, there always is a positive surplus from trade: the probability that the buyer's valuation is larger than the seller's cost is equal to one. If it is uncertain whether a surplus exists and if the parties are privately informed of their respective values and costs, the mechanism design problem becomes more complicated. In particular, if the values and costs are uncorrelated, we may run into the (strong) inefficiency result of Myerson and Satterthwaite: there will be no mechanism that realizes all positive surplus. See Roger Myerson and Mark Satterthwaite, *Efficient Mechanism for Bilateral Trading*, 29 J. Econ. Theory 265 (1983). When the values and costs are correlated, as in our example, realizing all possible gains will become easier since the mechanism designer can use one party's report to learn about the other's information. See Jacques Cremer and Richard McLean, *Optimal Selling Strategies under Uncertainty for a Discriminating Monopolist when Demands are Interdependent*, 53 *Econometrica* 345 (1985).

qualities for both types and set $p_1 = c_1(q_1^*)$ and $p_2 = c_2(q_2^*)$. For simplification, we will assume that the marginal cost of producing for type-1 consumer isn't too much larger than the marginal cost of producing for type-2, so that the first best requires the type-1 consumer to purchase a higher quality product, $q_1^* \geq q_2^*$, and that, at first best, the type-1's utility is higher than type-2's utility, $v_1(q_1^*) \geq v_2(q_2^*)$. Figure 3 presents an example in which $q_1^* > q_2^*$. In addition, to make the problem interesting, unless otherwise stated, we assume that $v_1(q_2^*) - c_2(q_2^*) > v_1(q_1^*) - c_1(q_1^*)$. The assumption implies that when the respective qualities are offered at marginal cost, the type-1 consumer will prefer to purchase the product intended for type-2 buyer. That is, adverse selection will result with marginal cost pricing.

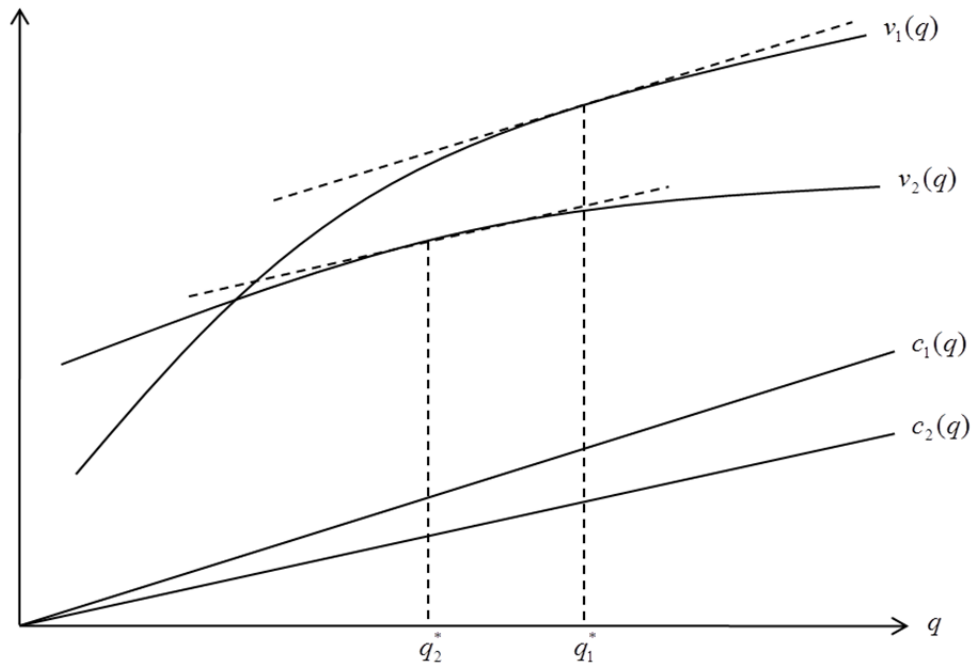


Figure 4: An Illustrative Example

A. Case 1: $\lambda > 1/2$

When $\lambda > 1/2$, the social planner cares more about the seller's profit than the buyer's surplus. From the objective function, $\theta((1 - \lambda)v_1(q_1) - \lambda c_1(q_1) + (2\lambda - 1)p_1) + (1 - \theta)((1 - \lambda)v_2(q_2) - \lambda c_2(q_2) + (2\lambda - 1)p_2)$, holding everything else constant, when $\lambda > 1/2$, higher prices strictly increase the value. As an extreme case, when $\lambda = 1$, the social welfare function becomes $\theta(p_1 - c_1(q_1)) + (1 - \theta)(p_2 - c_2(q_2))$ and the problem becomes identical to a monopolist trying to maximize its profit by offering a menu of contracts to a potential customer.

PROPOSITION 1: *Suppose $\lambda > 1/2$. The social planner will implement $q_1 = q_1^*$ and $q_2 < q_2^*$. In equilibrium, type-2 consumer realizes zero consumer surplus while type-1 consumer will realize positive surplus. As $\lambda \rightarrow 1$, q_2 decreases.*

PROOF: When $\lambda > 1/2$, in equilibrium, the participation constraint for type-2 consumer (the fourth constraint) and the incentive compatibility condition for type-1 consumer (the fifth

constraint) will bind: $v_2(q_2) - p_2 = 0$ and $v_1(q_1) - p_1 = v_1(q_2) - p_2$. If we let $p_2 = v_2(q_2)$ and $p_1 = v_1(q_1) - v_1(q_2) + v_2(q_2)$ and substitute these into the social welfare function, we get $\theta(\lambda(v_1(q_1) - c_1(q_1)) + (2\lambda - 1)(v_2(q_2) - v_1(q_2))) + (1 - \theta)\lambda(v_2(q_2) - c_2(q_2))$. When we maximize the objection function with respect to q_1 and q_2 , we get

$$\begin{aligned}\theta(v'_1(q_1) - c'_1(q_1)) &= 0 \\ \theta(2\lambda - 1)(v'_2(q_2) - v'_1(q_2)) + (1 - \theta)(v'_2(q_2) - c'_2(q_2)) &= 0\end{aligned}$$

From the first inequality, it is clear that $q_1 = q_1^*$. That is, the social planner will set the quality for type-1 consumer at the optimal level. We can rewrite the second equality as

$$v'_2(q_2) = c'_2(q_2) - \frac{\theta}{1 - \theta}(2\lambda - 1)(v'_2(q_2) - v'_1(q_2))$$

Since $v'_2(q_2) - v'_1(q_2) < 0$, in order to satisfy the equality, we must have $q_2 < q_2^*$. The type-2 consumers will receive suboptimal quality in equilibrium. Furthermore, as $\lambda \rightarrow 1$, the right hand side of the equality gets smaller, making it necessary to reduce q_2 more to satisfy the equality. *Q.E.D.*

In equilibrium, type-1 consumer is able to realize a positive surplus (since $p_2 = v_2(q_2)$ and $p_1 = v_1(q_1) - v_1(q_2) + v_2(q_2)$), known as the “informational rent” in the literature. Since the social planner cares more about the seller’s profit than the buyer’s surplus ($\lambda > 1/2$), any surplus that is taken away from the seller imposes an opportunity cost: transferring one dollar from the buyer to the seller increases the overall social welfare when $\lambda > 1/2$. Hence, to reduce the surplus captured by the type-1 consumer, the social planner introduces inefficiency on type-2 consumer. Furthermore, as the social planner cares more and more about the seller’s profit vis-à-vis buyer’s surplus, the size of the distortion gets larger: the social planner imposes even less favorable terms on type-2 buyer.

Figure 4 represents the optimal set of contracts when the social planner cares only about the seller’s profit ($\lambda = 1$). The dashed curve represents type-1 consumer’s utility shifted down to cross at the optimal (p_2, q_2) . Note that while type-2 consumer’s surplus has been eliminated, type-1 consumer realizes some positive surplus. This is known as “informational rent” in the literature. Had the social planner chosen the first best qualities (q_1^*, q_2^*) , surplus captured by type-1 consumer would have been much larger. To reduce that surplus, the social planner reduces the quality offered to type-2 consumer. A marginal reduction in quality for type-2 consumer produces the benefit of being able to charge a higher price to type-1 consumer and the cost realizing a smaller profit from type-2 consumer. At optimum, the benefit will be set equal to the cost.

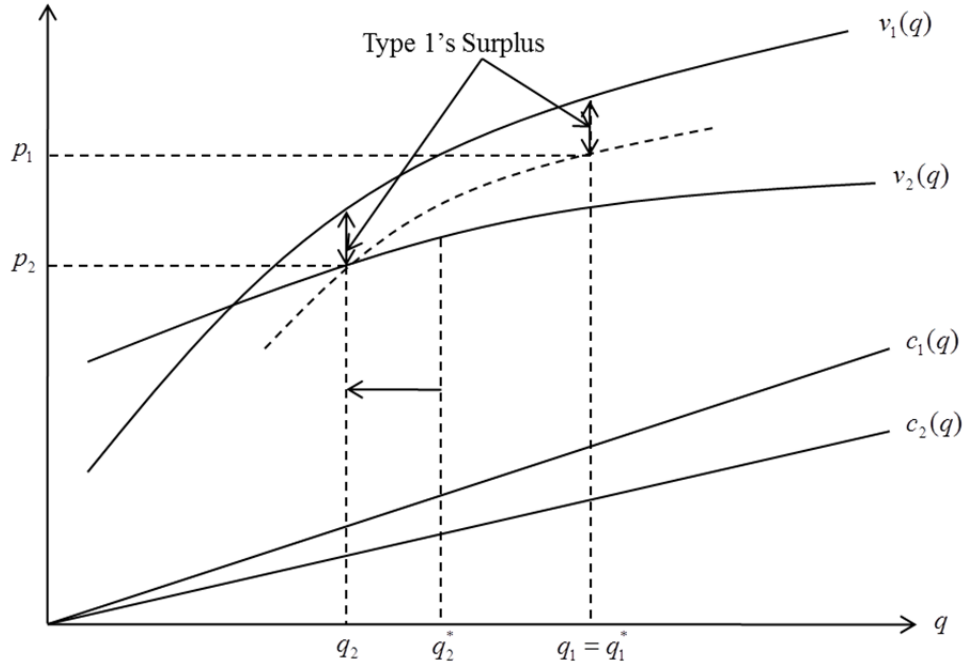


Figure 5: Optimum when $\lambda = 1$

B. Case 2: $\lambda < 1/2$

With $\lambda < 1/2$, the seller's profit gets smaller weight in the objective function compared to the buyer's surplus in the social welfare function. From the objective function, $\theta((1 - \lambda)v_1(q_1) - \lambda c_1(q_1) + (2\lambda - 1)p_1) + (1 - \theta)((1 - \lambda)v_2(q_2) - \lambda c_2(q_2) + (2\lambda - 1)p_2)$, holding everything else constant, when $\lambda < 1/2$, higher prices strictly lower the value. As an extreme case, when $\lambda = 0$, the objective function becomes $\theta(v_1(q_1) - p_1) + (1 - \theta)(v_2(q_2) - p_2)$ and the problem becomes equivalent to a monopsonist trying to maximize its profit, or buyer making a take-it-or-leave-it offer to the seller.

PROPOSITION 2: *Suppose $\lambda < 1/2$. The social planner will implement $q_1 = q_1^*$ and $q_2 < q_2^*$. In equilibrium, seller realizes zero profit while the buyer captures all the surplus. As $\lambda \rightarrow 0$, q_2 decreases.*

PROOF: In equilibrium, the seller's zero profit conditions (the first two constraints) will bind: $p_1 - c_1(q_1) = 0$ and $p_2 - c_2(q_2) = 0$. In addition, with the assumption of $v_1(q_2^*) - c_2(q_2^*) > v_1(q_1^*) - c_1(q_1^*)$, type-1 consumer's incentive compatibility condition (the penultimate constraint) will also bind: $v_1(q_1) - p_1 = v_1(q_2) - p_2$. When we use the three equalities to simplify the welfare function, and set up a Lagrangian with type-1 consumer's binding incentive compatibility condition, we get

$$\mathcal{L}(q, \mu) = (1 - \lambda)\{\theta(v_1(q_1) - c_1(q_1)) + (1 - \theta)(v_2(q_2) - c_2(q_2))\} - \mu(v_1(q_1) - c_1(q_1) - v_1(q_2) + c_2(q_2))$$

where μ is the Lagrangian multiplier. When we maximize with respect to (q_1, q_2, μ) , we get

$$\begin{aligned} (1 - \lambda)\theta(1 - \mu)(v'_1(q_1) - c'_1(q_1)) &= 0 \\ (1 - \lambda)(1 - \theta)(v'_2(q_2) - c'_2(q_2)) + \mu(v'_1(q_2) - c'_2(q_2)) &= 0 \\ v_1(q_1) - c_1(q_1) - v_1(q_2) + c_2(q_2) &= 0 \end{aligned}$$

To satisfy the first equality (with $\mu > 0$), we must have $q_1 = q_1^*$. When the second equality is rearranged,

$$v'_2(q_2) = c'_2(q_2) - \frac{\mu}{(1 - \lambda)(1 - \theta)}(v'_1(q_2) - c'_2(q_2))$$

Suppose $q_2 = q_2^*$. Then, because $v'_1(q_2^*) > v'_2(q_2^*) = c'_2(q_2^*)$, the equality will be violated. To restore the equality, we must have $q_2 < q_2^*$.¹¹³ Type-1 consumer will receive product with optimal quality but type-2 consumer will receive suboptimal quality in equilibrium. As $\lambda \rightarrow 0$, the right hand side of the inequality gets smaller, further necessitating the reduction of q_2 . *Q.E.D.*

Figure 5 represents the optimal set of contracts when the social planner wants to maximize the consumer surplus ($\lambda = 0$). Compared to the previous case, the seller's profit is completely eliminated and the social planner allocates the entire surplus to the buyer. The social planner is able to eliminate producer surplus because the seller has no private information: the seller does not have any informational advantage and, therefore, cannot realize any "informational rent."

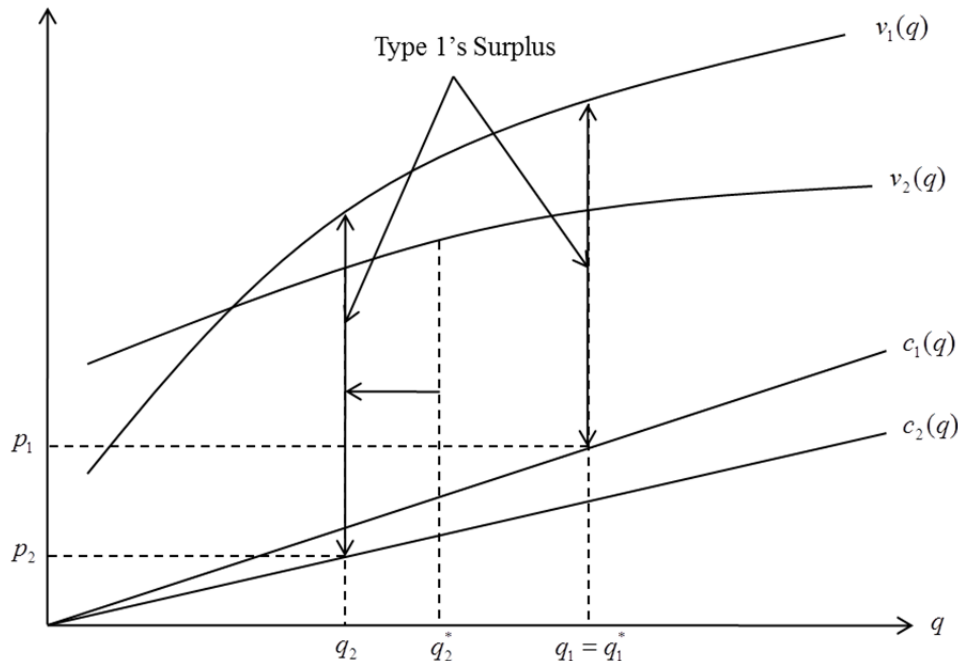


Figure 6: Optimum when $\lambda = 0$

¹¹³ Starting from q_2^* , as we decrease q_2 , $v'_1(q_2)$ decreases at a higher rate than $v'_2(q_2)$ thereby decreasing the gap between $v'_2(q_2) - c'_2(q_2)$ and $v'_1(q_2) - c'_2(q_2)$.

At the same time, the social planner does have to worry about keeping type-1 consumer from choosing the contract intended for type-2 consumer. Under the assumption that $v_1(q_2^*) - c_2(q_2^*) > v_1(q_1^*) - c_1(q_1^*)$, had the social planner chosen the efficient qualities with zero seller profit, $(p_2, q_2) = (c_2(q_2^*), q_2^*)$, type-1 consumer would prefer choosing the contract intended for type-2 buyer. And, when both types pool on $(p_2, q_2) = (c_2(q_2^*), q_2^*)$, not only is the equilibrium inefficient (thereby reducing the surplus that could have gone to type-1 buyer), the seller also realizes (in expectation) a negative profit, since the price is lower than the average cost of serving both types of buyer. Hence, to keep the seller in the market while preventing type-1 buyer from pooling with type-2 buyer, the social planner has to reduce the quality below the efficient level offered to type-2 buyer.

C. Case 3: $\lambda = 1/2$

When the social planner assigns equal weight to the buyer and the seller's surplus, the objective (social welfare) function becomes $1/2 (\theta(v_1(q_1) - c_1(q_1)) + (1 - \theta)(v_2(q_2) - c_2(q_2)))$. Note that the price terms disappear from the objective function since they only affect the distribution of the surplus. When the social planner care equally about buyer's and seller's welfare, even though she does not directly observe buyer type, we can show that the social planner will always implement the first best, i.e., she will not introduce any distortions.

PROPOSITION 3: *Suppose $\lambda = 1/2$. The social planner implements the first best: $(q_1 = q_1^*, q_2 = q_2^*)$.*

PROOF: Let $q_1 = q_1^*$ and $q_2 = q_2^*$. We just need to find the set of prices (p_1, p_2) that satisfy all the constraints. This can be done in a following manner. First, if $q_1^* = q_2^*$, this is easily achieved by letting $p_1 = p_2 \in (c_1(q_1^*), v_2(q_2^*))$. Second, suppose that $q_1^* > q_2^*$. Let $p_1 = v_2(q_2^*)$ and $\delta \equiv v_1(q_1^*) - v_2(q_1^*)$. Given the simplifying assumption of $v_2(q_1^*) \geq v_2(q_2^*)$, we know that $\delta \geq 0$. Given the single crossing condition, $v_1'(q) > v_2'(q)$, and the condition that $q_1^* > q_2^*$, we must have $v_1(q_2^*) - \delta < v_2(q_2^*)$. Once we let $p_2 \in (v_1(q_2^*) - \delta, v_2(q_2^*))$, we have found the solution. Since the respective qualities are set at the optimal level, the social planner cannot do any better.

Q.E.D.

Figure 6 graphically demonstrates the proof. The dotted curve represents type-1 consumer's utility shifted down to cross at $v_2(q_1^*)$. Suppose the social planner sets $p_1 = v_2(q_2^*)$, and sets p_2 at anywhere between $v_2(q_2^*)$ and the dotted curve. Type-1 consumer has no incentive to choose (p_2, q_2^*) since that would make her strictly worse off. Similarly, type-2 consumer has no incentive to choose (p_1, q_1^*) since that would give her zero utility while (p_2, q_2^*) gave her a strictly positive utility. Both types of consumers realize a strictly positive surplus and are offered optimal level of quality, respectively. When $\lambda > 1/2$ or $\lambda < 1/2$, because quality can be varied continuously, the social planner will again impose some inefficiency in the market. However, as λ approaches $1/2$, the size of the inefficiency will gradually disappear. That is, $q_2 \rightarrow q_2^*$ as $\lambda \rightarrow 1/2$.

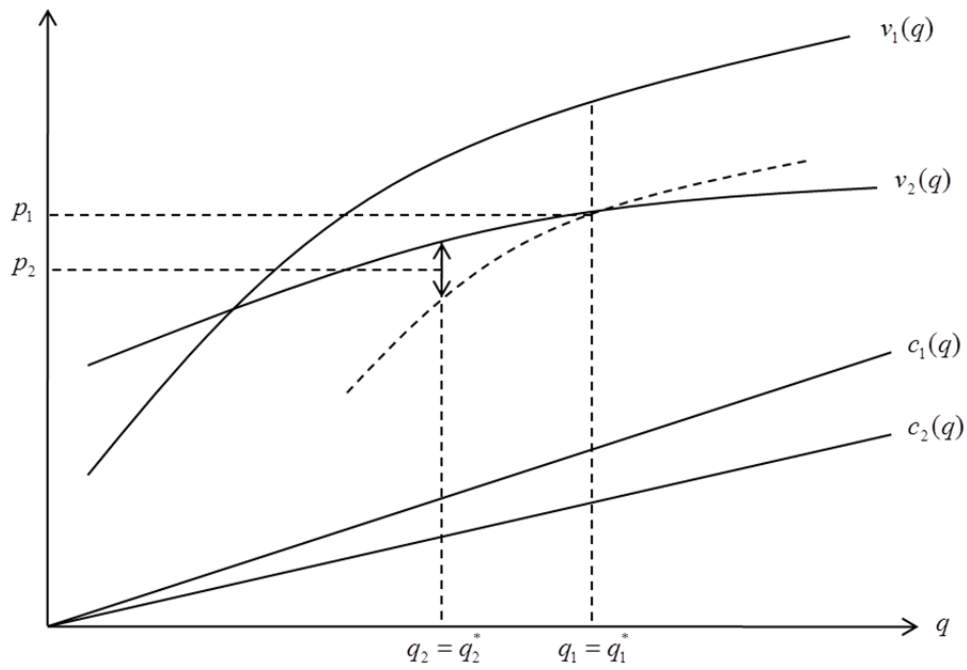


Figure 7: Candidate First-Best Solution when $\lambda = 1/2$