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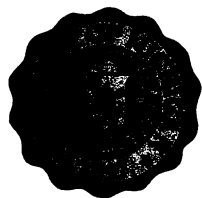
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Your Terms or Mine?
The Duty to Read the Fine Print in Contracts

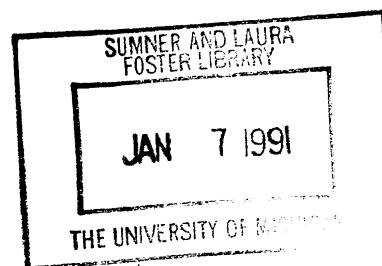
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Your Terms or Mine? The Duty to Read the Fine Print in Contracts

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Abstract. This paper examines the legal rules that govern the interpretation of standardized form contracts. Different legal rules induce different bargaining games between buyers and sellers, and can have consequences for the efficiency of exchange when communication is costly. The traditional common-law rule, which binds an assenting recipient of a form contract to fine-print terms he has not read, has little effect in encouraging parties to read contracts, contrary to the conventional wisdom among lawyers. Instead, there is little practical difference between a rule that nominally holds the drafter of a form contract responsible for communicating its terms, and one that holds the receiving party responsible. Moreover, the traditional rule may be Pareto inferior to a rule providing presumptive warranties when negotiation is costly.

Keywords. Contract law, bargaining, product quality

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**Your Terms or Mine?
The Duty to Read the Fine Print in Contracts**

Avery Katz

The rules of contract law, as administered by courts and other public officials, regulate many aspects of private exchange. Among the most puzzling and difficult of these rules (at least, in the opinion of lawyers) are those regarding the formation and interpretation of contracts. Such rules govern the questions: which objectively verifiable actions suffice to conclude a bargain and form a contractual obligation; and how do the parties' objective actions affect the substantive content of any contract that is formed?

Legal rules of contract formation and interpretation have so far attracted little attention from economists, even among those studying contract law. Instead, the literature has largely focused on other doctrinal areas dealing with the consequences of contracts once formed. It would be surprising, however, if formation and interpretation rules were merely conventional, as they often seem to be regarded in the law-and-economics literature. Bargaining theory tells us that when information is imperfect or communication costly, self-interested parties will generally fail to realize the full surplus from exchange. Just how much is wasted will depend on the precise structure of the institutions that govern the bargaining. Different legal rules will result in different background structures, and will induce different bargaining games. Hence they can have important consequences for the outcome and efficiency of exchange.

This paper examines the legal rules that govern the interpretation of non-dickered (and usually unread) printed terms appearing in standardized form contracts. Such contracts have been in wide commercial use for decades, as they provide a way for regular market participants to conserve on transaction costs and to realize economies of scale in marketing. Their legal interpretation, however, has generated considerable controversy among courts and legal commentators, and over the past few decades the law governing them has been in flux. In recent years, courts have been increasingly willing to ignore fine-print terms and interpret form contracts against the interests of the drafting party. Nonetheless, various legal rules are still applied to the problem today, and for lawyers the question remains: to what extent do and should standardized contract terms govern a bargain? Alternatively, one might take the viewpoint of a person faced with an offer embodied in a standard form, and ask: is there or should there be a duty to read the fine print?

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I develop below a simple model of bargaining in the form–contract setting, and use the model to investigate the consequences of a variety of possible legal rules governing contract interpretation. The analysis grows out of the basic insight that whatever the legal rule, no one who is offered a form contract in equilibrium will read the fine print. The underlying intuition for this is roughly the following: suppose there were some persons who read the fine print, in order to obtain information about product quality or similar aspects of the contract. Of this hypothetical set of readers, consider the subset among them who value quality most. This subset will get quality no higher than the level that is just necessary to induce them to accept the offer. Therefore, they lose their sunk costs of reading, will not find it worthwhile to expend the effort to read in the first place, and will drop out of the group of readers. But the argument can be repeated with the most quality–sensitive among those remaining, and the equilibrium unravels until eventually there are no readers left. Accordingly, a rule that attaches harsh consequences to a failure to read contracts carefully — contrary to the claims of some legal commentators — will not induce persons to start reading the fine print. Such a rule will only cause some exchanges to be foregone.

This conclusion has several implications for the legal rules of contract interpretation. One consequence is that there will be no effective difference between a rule that holds the drafter of a form contract responsible for communicating the terms of the fine print, and one that holds the recipient responsible. In either case, the expense of any communication will be borne by the drafter alone. A second consequence is that courts or regulatory authorities can improve social welfare by providing implied warranties and by refusing to give effect to fine–print terms.

The model can also be understood as an extension of George Akerlof’s well–known analysis of the market for lemons. As Akerlof and others have argued, market equilibrium is inefficient when there is no institution available that provides information about the differing attributes of heterogeneous buyers and sellers. One particular institution that has been widely suggested as serving this purpose is the warranty contract, in which one party to a transaction promises the other that the exchange will be of a specific nature. Warranties and other analogous promises can only provide a solution to the lemons problem, however, if individual buyers and sellers find it in their interests to communicate and learn about the particular terms of exchange. The discussion to follow indicates that they often will lack the incentive to do so when communication is costly. Their incentives, however, can be altered in this regard by the rule of law.

These ideas are developed more fully in the several sections below. Section 1 begins by introducing some economic and legal background on the issue of form contracts. Section 2 presents my model of contract negotiation in the form–contract setting, and derives the model’s equilibrium

outcome under a variety of legal rules. Section 3 presents the welfare economics of the various rules. Section 4 suggests extensions of the analysis and concludes.

1. Form contracts: economic and legal background

In a mass production economy the terms for exchange of goods between buyer and seller obviously need to be standardized in some fashion, as the cost of repeated individual negotiations is high, especially for complex goods and transactions. As a result, many who participate in the market on a regular basis find it worthwhile to develop standard written forms which set out in print the terms upon which the drafter proposes to do business. This enables them to take advantage of economies of scale in determining the terms that maximize their surplus from the transaction, and in drafting the written agreement that embodies those terms.

If the standard forms are to serve their function of economizing on the costs of negotiation, each individual exchange cannot provide the occasion for re-opening the terms of the bargain. At a minimum, the written terms must be regarded as at least presumptively non-negotiable; and in practice, such a presumption may be impossible to override. In fact, form contracts in actual use often provide that the negotiating agent lacks the authority to vary the written terms.¹

The fact that certain terms are not negotiable, of course, does not mean that there is no negotiation at all. Typical written forms leave blank spaces to be filled in with essential terms that are actually dickered — usually including price, quantity, and the date of shipment or delivery. In general, one would expect the negotiable terms to be adjusted in individual transactions, depending on how the printed terms affect the individual circumstances of the drafter's partner.

If the content of the standard forms is completely understood by both bargainers, one might think that there would be no strong social welfare concerns regarding their use, apart from any second-best considerations arising from the interaction of form contracts with other market imperfections such as monopoly. If both parties know the terms of the form contract and bear the full costs of negotiation, one might conjecture that they would choose to use form contracts whenever the savings in negotiation costs outweigh the advantages of tailoring the bargain to their individual needs. It is not difficult, indeed, to devise a simple competitive model in which this is the result.

¹Such disclaimers are presumably intended to address the agency problem faced by the drafter of the contract, given the negotiating agent's compensation contract. Otherwise, the agent might be tempted to vary the contract in a way that his principal might not wish, in order to obtain an additional sale and commission. For example, insurance agents typically have the incentive to write contracts insuring excessively poor risks; for this reason such contracts commonly provide (in fine print) that the insurance contract is subject to the ultimate approval of the insurer's home office.

Despite their evident advantages, however, form contracts have been received by courts and by legal commentators with ambivalence and, on occasion, with suspicion. In part, this is because of the association some lawyers have drawn between such contracts and the alleged presence of market power. The take-it-or-leave-it aspect that form contracts display with regard to some terms of exchange has been analogized to the power a monopolist has over price.² According to one prominent school of thought, for instance, form contracts are referred to as "contracts of adhesion" and are regarded as inherently coercive.³

The law's ambivalence toward form contracts, however, goes beyond the fact that a party faced with a form offer is unable to negotiate all terms individually with the offeror. More importantly, contracting parties, often consumers, often purport to accept form offers without knowing or understanding the terms within. This is individually rational, since the cost of reading and considering the meaning of each term is costly, and many of the terms deal with the consequences of improbable contingencies. Few consumers attempt to read all the terms of their leases, insurance policies, or automobile loan contracts, although they may occasionally make a show of doing so in order not to appear unsophisticated. Of those who do try to read form contracts, fewer understand them, since the terms are often written in fine print to save on the costs of paper and handling, and expressed unclearly or in legal or technical jargon in order to save on the expenses of drafting.

The situation is not confined to consumer contracts. Purchasing agents do not read the nonessential terms of price quotation sheets and sales agents do not read the terms of purchase orders; it simply is not worth their time and effort to do so. Moreover, some of the terms of standard forms are primarily included for purposes of internal organizational control, and only secondarily for their effects on the bargain. Quite commonly, agents of the drafting party do not even know the contents of their own forms, although their principals presumably do.

The fact that form contracts are often accepted unread poses both theoretical and practical problems with their enforcement. The practical problem, of course, is that imperfect information about contract terms can lead to efficiency losses from adverse selection and moral hazard, and to unfair redistribution of wealth when contracting parties are surprised by the terms to which they are bound. Legal commentators have additionally been concerned with a more theoretical problem:

² Admittedly, the analogy has often been poorly reasoned; the fact that several firms in an industry include similar terms in their standard forms has been regarded by some courts as *prima facie* evidence of either conspiracy or oligopoly. Furthermore, legal commentators have incorrectly assumed that the presence of market power generally implies that terms chosen by sellers will be excessively or inefficiently favorable to sellers, by supposed analogy to the effect of market power on price.

³ See, e.g., Kessler (1943), Rakoff (1983).

how is it possible for a person freely to agree to be bound by an obligation without knowing just what he is agreeing to? According to orthodox contract theory, the formation of a contract requires mutual assent, sometimes described as a "meeting of the minds." Economists may regard the issue as a metaphysical one, but legal philosophers have found three major approaches to this question. Each approach depends to a greater or lesser extent on the use of a fiction; each results in a different rule of interpretation.

One possibility is that by accepting a form offer, a consumer⁴ agrees to delegate the authority to the seller to set whatever non-dickered terms he pleases. Lawyers usually refer to this rule by saying that the consumer has a "duty to read" the contract; if he neglects this duty he waives any objection to the consequences. The "duty to read" is often said to have been the position of the traditional Anglo-American common law at the beginning of this century, although its harshness was undoubtedly mitigated in some cases by the effect of other legal doctrines. One obvious advantage of this rule is its relative ease of administration, since to determine the contract's content one simply consults its written provisions.

A second possibility, at the other extreme, is that the offer of a form contract is interpreted as containing the set of non-dickered terms that is most in the consumer's interest. When the consumer accepts, he gets those terms. This rule is sometimes described as implying a "duty to speak" on the part of the drafter, who risks being bound unfavorably if he does not bring the content of any standardized terms to the consumer's attention. Defenders of the "duty to speak" argue that the seller knows both that the consumer will not read and that it is not reasonable for him to read. Sometimes they also argue that the seller, as creator of the terms, is in a position to bring them to the buyer's attention more easily and cheaply.

A third and intermediate possibility is that the parties to a form contract agree that non-dickered terms will be governed by some external criterion, either custom or, in some formulations, the imagined judgment of some hypothetical impartial observer (the "reasonable person"). It is up to either party to make special negotiating efforts if he does not like the customary standard. This rule is the most costly to administer, since the court enforcing the contract will have to determine the dictates of custom or of the reasonable person. Over time, however, as courts decide many such disputes, the external criterion will naturally become more clearly defined.

Combinations of these three basic approaches are also possible. For instance, one could imagine a rule which gives the seller the authority to set the contract terms within certain limits, with the

⁴For concreteness, the rest of the discussion in this paper will proceed as if the drafters of form contracts are always firms offering products for sale, and the offerees are always consumers. Nothing in the analysis depends upon this characterization.

limits arising from custom or from the reasonable person standard. If the seller wishes to set the terms outside those limits, he must speak; if the buyer wishes to avoid being bound by the seller's choice within the limits, he must read. Or, the legal rule might provide that the printed terms are effective if the buyer learns about them in any way, either by the seller's efforts or his own, while if there is no communication, the presumptive standard governs. One might call this an "actual knowledge" standard.

Alternatively, the legal rule could dispense entirely with freedom of contract and simply require a particular set of terms — one that the parties would not be free to negotiate around even if they bargained explicitly. Like form contracts, legal requirements are a way to provide the benefits of standardization, albeit on a centralized rather than decentralized basis. Such a rule has obvious costs when the population of buyers and sellers is heterogeneous, but it saves on negotiation and could conceivably be desirable in a second-best environment. Current contract law has some provisions for absolutely required and prohibited terms, primarily in consumer good settings. Usually these requirements are justified on the grounds of consumer irrationality, but sometimes they are also defended on the grounds of avoiding wasteful or fraudulent attempts to offer terms that no rational consumer would accept.

Current law applies each of these approaches in various settings. Debates among legal commentators tend to be between those who stress the benefits of standardization and decentralization on one hand, and those who stress either the fairness of the transaction or the metaphysical requirements of mutual assent. Occasionally one finds informal justifications of the duty to read on transactions costs grounds (more commonly in older cases), but when courts assert that the duty to read is more efficient, they usually are speaking in terms of their own costs of adjudication and enforcement.

We will pose the question somewhat differently. Given the benefits of standardization, which rule best trades off the two goals of saving on negotiation costs and choosing the terms best suited to individual circumstances? The next section develops a simple model of contract bargaining in the form-contract setting in which to make the question more precise. The model is necessarily and deliberately oversimplified. But, it includes in its assumptions the minimal conditions necessary to make the problem interesting: private and social costs associated with suboptimally chosen contract terms, a positive cost associated with reading others' form contracts or explaining one's own forms to others, and heterogeneous buyers and sellers, so that a social planner cannot achieve the first-best by setting required terms.

2. A model of form-contract bargaining

Consider a single seller who offers a contract to sell a good to a single buyer, who can either accept or reject the offer without further consideration. Alternatively, the buyer can choose to read the contract if the seller has not already explained its contents. Suppose there is a population of such buyers and sellers of various types (alternatively, one may think of some probability distribution defined over types of buyers and sellers). Also suppose that the buyer either buys a single unit of the good or none at all.

The good, or the contract for its sale, can have varying amounts of some characteristic. I call this characteristic "quality" in order to link up this analysis with the literature on product quality. But the characteristic might also usefully be thought of a warranty, a provision for arbitration in the event of a dispute, the allocation of delivery costs, or the like. This characteristic is denoted by the scalar variable $x \in [0, 1]$; corresponding to the possibility, for example, that a product may have no warranty, a partial warranty, or a full warranty.

Assume that the seller's marginal cost of production is constant with respect to quantity. Denote it as $ak(x)$, where $k(\cdot)$ is a cost function common to all sellers, and a is a scalar variable denoting the seller's type. Assume that additional levels of quality are increasingly costly for all seller types, so that $k'(x) > 0$ and $k''(x) > 0$. The degree to which marginal cost varies with x , though, varies according to the type a . Similarly, the buyer's willingness to pay for a unit of the good is $V - bc(x)$, where V denotes the good's value aside from considerations of quality, $c(\cdot)$ is a cost function common to all buyers, and b denotes the buyer's type. Assume that the buyer's reservation price rises with quality, but at a decreasing rate, so that $c'(x) < 0$ and $c''(x) > 0$. Intuitively, a denotes the intensity of the seller's preference for low x , while b denotes the intensity of the buyer's preference for high x .

I suppose there are a continuum of types of buyers indexed by b , with finite support $[b_0, b_1]$. The probability that the buyer is of type $b \leq t$ is described by the cumulative density function $F(t)$, which has associated probability density function $f(t)$. Similarly, I will usually suppose that there are also a continuum of types of sellers indexed by a , with finite support $[a_0, a_1]$ and cumulative density function $G(\cdot)$, but occasionally I will assume that all sellers are of the same type a . Notice that buyers and sellers' preferences regarding the value of x are always strictly opposed given price and quantity; this assumption will be important in determining the equilibrium. Notice that with a fully informed buyer, expected demand becomes more elastic as x increases, and the seller can

accordingly capture more of the consumer surplus. In fact, if $c(1) = 0$, then demand is perfectly elastic and a seller can capture the full surplus from the transaction.⁵

The bargaining process allows the seller to specify price and quality, and also to choose between standard terms and individual negotiation. The seller offers a contract for sale to the buyer in a written form that can be described by the three variables (P, z, σ) . P is the price, and it is costlessly visible to the buyer. The variable $z \in [0, 1]$ denotes the seller's proposal for the value of x ; depending on the legal rule in force, the actual value of x implied by the final contract may or may not be the same as the seller's proposal z . The value of z cannot be observed by the buyer without some cost. This cost, however, can be borne either by the buyer or by the seller. σ denotes the probability that the seller bears this cost, sending an explicit offer that the buyer sees as (P, z) . If the seller sends a form offer, in contrast, the buyer sees only the price P .

The seller can notify the buyer of the true value of z , or "speak," at a cost of S . I interpret this as using individualized negotiation instead of a form contract.⁶ If the seller does not speak, the buyer can "read," and inspect the offer himself at a cost of R , thus learning the value of z . After the seller decides on an offer and the buyer decides whether to read, the buyer decides whether to accept based on his information about P and z . Denote the probability that a buyer of type b reads a form offer P as $\rho(P, b)$, the probability that he accepts a form offer without reading as $\alpha(P, b)$, and the probability that he declines a form offer without reading it as $1 - \alpha - \rho$. If the buyer ever learns the value (P, z) , he must then decide whether to accept or reject. Once the buyer accepts or rejects, bargaining ends.

A buyer's strategy then takes the form of a choice of functions $\rho(P, b)$ and $\alpha(P, b)$ determining the response to a form offer P . If the offer is ever made explicit, either because the seller has spoken or because the buyer has read the offer, the buyer's optimal strategy is trivial: he rejects if and only if P is more than his full-information reservation price, $V - bc(x)$. A seller's strategy takes the form of a (possibly randomized) choice of (P, z) and a function $\sigma(P, z)$ describing the probability of speaking given (P, z) . I focus here on analyzing the Bayesian-Nash equilibria of the bargaining process, where each side's strategy is a best response to the other's, given suitable updating of probabilities via Bayes' rule.

⁵The assumption that V is the same for all buyers is clearly special. However, one could let V vary among buyers independently of b , in which case increasing z would still make demand more elastic, and the nature of the results would be much the same. The seller would still want to trade off the benefits of cost saving against the benefits of capturing more of the surplus of inframarginal consumers.

⁶I assume that if the seller undertakes to do the notification, that the cost to the buyer is zero. In reality, there is probably a cost to the buyer associated with sitting still long enough for the seller to explain things; I discuss this issue below in the interpretation of the results.

Legal rules of interpretation

The equilibrium outcome will depend upon the legal rule governing contract interpretation. I model the legal rule as a function $x(z, \sigma, \alpha, \rho)$ that makes the legally implied quality level x depend on the seller's proposal z as well as on the parties' communication efforts. Consider the following possible rules for interpreting form contracts:

(1) *Duty to read*: $x = z$ for $z \in [\bar{x}_0, \bar{x}_1]$, $x = \bar{x}_0$ for $z < \bar{x}_0$, $x = \bar{x}_1$ for $z > \bar{x}_1$.

(2) *Duty to speak*: $x = \bar{x}$ unless seller speaks; else $x = z$ for $z \in [\bar{x}_0, \bar{x}_1]$, $x = \bar{x}_0$ for $z < \bar{x}_0$, $x = \bar{x}_1$ for $z > \bar{x}_1$.

(3) *Actual knowledge*: $x = \bar{x}$ unless either seller speaks or buyer reads; else $x = z$ for $z \in [\bar{x}_0, \bar{x}_1]$, $x = \bar{x}_0$ for $z < \bar{x}_0$, $x = \bar{x}_1$ for $z > \bar{x}_1$.

(4) *Irrebuttable presumption*: $x = \bar{x}$.

Under the duty to read, the quality legally implied under the contract depends only on the seller's proposal z . Whether the value of z has actually been communicated to the buyer is irrelevant; if the buyer accepts a form offer without reading he assumes the risk of low quality. This risk, however, is not unbounded. As I formulate the duty to read (and as it was often applied historically), the seller's discretion to set quality may be limited to a subset of possible values. In actual cases the legal limits on the seller's discretion may depend upon custom, the hypothetical expectations of a reasonable market participant, the discretion of a common-law court,⁷ or the dictates of a regulatory statute. Here they are simply measured by the interval $[\bar{x}_0, \bar{x}_1]$. If the seller's discretion is unlimited, then just interpret $\bar{x}_0 = 0$ and $\bar{x}_1 = 1$.

Under the duty to speak, the value of x depends additionally upon whether the seller has notified the buyer of his proposal z . If the seller has spoken and the buyer accepts, then the seller's proposal controls, subject to possible limits on discretion $[\bar{x}_0, \bar{x}_1]$. If the seller does not speak, however, his proposal z is irrelevant, and the legally implied quality is determined by the presumptive value \bar{x} . Like the limits on discretion, the value of \bar{x} may be governed in practice by custom, reasonable commercial expectations, or statute.

The actual knowledge rule is similar to the duty to speak, except that the seller's proposal z will control the contract terms if the buyer learns about it in any way, either through the seller's efforts or his own. Thus if the seller does not speak, a buyer who accepts after reading gets the

⁷In this regard, one standard for the lower limit frequently applied in actual cases is that of *unconscionability*, which turns on whether the unread contract terms are deemed to shock the conscience of the court. In this model I abstract from the complications imposed by the uncertain legal standards that result.

seller's proposal z , and a buyer who accepts without reading gets the presumptive quality \bar{x} . And finally, under the irrebuttable presumption rule, quality is mandated to be \bar{x} in all circumstances. One may view this as the polar case of limits on discretion, where $\bar{x}_0 = \bar{x}_1 = \bar{x}$. Since negotiation as to quality is not allowed under this last rule, of course, there is no point in either speaking or reading.

The quality \bar{x} presumed under rules (2) and (3), and the limits on discretion \bar{x}_0 and \bar{x}_1 , can be set at various levels; and the particular values chosen for these parameters may be as important to the outcome as the type of rule chosen. The case for limits on the seller's discretion is ostensibly strongest for the duty to read, since under that rule they may help to alleviate problems of imperfect information. Limits on discretion under the duty to speak or actual knowledge rule, on the other hand, prevent the parties from knowingly contracting around the law, and must be justified on grounds of some other kind of market failure.

Let us assume that the legal regime in force and the relevant parameters \bar{x}_0, \bar{x}_1 , and \bar{x} , are common knowledge. One can then speak without loss of generality of the seller choosing x rather than choosing z , and I do this in the remainder of the paper. It turns out that under each of these rules, the seller's equilibrium strategy takes a particularly simple form; namely, either choose the level of x that would maximize profits were communication costless (consistent with any limits on discretion), and notify the buyer of the quality level, or do not speak and set x as low as the law allows. To show this, it is useful to consider in turn the consequences for the seller of speaking and not speaking under each of the legal rules.

Subgame following seller's decision to speak

If the seller does decide to spend S to notify the buyer of the true value of x , which values of P and x will he choose? The answer is independent of the rule of interpretation. Since buyers are then perfectly informed, expected demand is then $F\left(\frac{V-P}{c(x)}\right)$, so the seller wants to solve the problem:

$$\max_{P,x} \pi = [P - ak(x)]F\left(\frac{V-P}{c(x)}\right) \quad (1)$$

It is equivalent as well as more convenient to think of the seller as choosing both x and the marginal type of buyer, $b(x, P)$. Then (1) becomes:

$$\max_{b,x} \pi = [V - bc(x) - ak(x)]F(b) \quad (2)$$

Assuming an interior solution, the first-order conditions to the seller's problem are:

$$\frac{\partial \pi}{\partial x} = [-bc'(x) - ak'(x)]F(b) = 0 \quad (3)$$

$$\frac{\partial \pi}{\partial b} = [V - bc(x) - ak(x)]f(b) - c(x)F(b) = 0 \quad (4)$$

and the second-order conditions are:

$$\frac{\partial^2 \pi}{\partial x^2} = [-bc''(x) - ak''(x)]F(b) < 0 \quad (5)$$

$$\frac{\partial^2 \pi}{\partial b^2} = [V - bc(x) - ak(x)]f'(b) - 2c(x)f(b) < 0 \quad (6)$$

$$\frac{\partial^2 \pi}{\partial x^2} \frac{\partial^2 \pi}{\partial b^2} - \left(\frac{\partial^2 \pi}{\partial b \partial x} \right)^2 > 0 \quad (7)$$

where:

$$\begin{aligned} \frac{\partial^2 \pi}{\partial b \partial x} &= [-bc'(x) - ak'(x)]f(b) - c'(x)F(b) \\ &= \frac{\partial \pi}{\partial x} \frac{f(b)}{F(b)} - c'(x)F(b) \end{aligned} \quad (8)$$

Closer inspection of the second-order conditions shows that $\partial^2 \pi / \partial x^2 < 0$. Moreover, whenever (4) is satisfied with equality, it follows that:

$$\frac{\partial^2 \pi}{\partial b^2} = c(x)f(b) \left(\frac{F(b)f'(b)}{f^2(b)} - 2 \right) \quad (9)$$

Since $\partial \pi / \partial b$ is positive when evaluated at $b = b_0$, it is a sufficient condition for a unique maximum on b given x that the right-hand side of (9) be negative for all b . This is the case for a wide variety of probability distributions on b , and I assume it holds here.⁸ As an example, if one considers the family of distributions $F_n(\cdot)$ such that

$$F(b) = \left(\frac{b - b_0}{b_1 - b_0} \right)^n \quad (10)$$

then $\partial^2 \pi / \partial b^2 = -c(x)f(b)(\frac{n+1}{n})$.⁹ In what follows, I will sometimes assume that $F(b)$ takes this convenient form in order to get an analytic solution for the equilibrium. As for the condition (7),

I will simply assume that it is satisfied.

⁸In particular, (9) is clearly negative whenever $f'(b) \leq 0$, and is also negative when $f''(b) \leq 0$ since this implies that either $f'(b) \leq 0$ or, if $f'(b) > 0$, that $F(b)f'(b) \leq f^2(b)$.

⁹The family $F_n(\cdot)$ is just the class of beta distributions on $[b_0, b_1]$ with $\alpha = n$ and $\beta = 1$; this includes the uniform distribution for the case $n = 1$. One can interpret n as the elasticity of demand with respect to the normalized marginal type, $\frac{b-b_0}{b_1-b_0}$.

Denote the values of b and x implied by (3) and (4) as (b^*, x^*) . I will refer to this as the *full-information profit-maximizing* outcome. Then, given the second-order conditions, it follows that the seller will choose $x = x^*$ and $b = b^*$ if the limits on his discretion permit. If his discretion is constrained, he will choose x as close to x^* as he is allowed and will choose b to satisfy the first-order condition (4). Let \hat{x} denote the seller's (possibly constrained) choice of x , where:

$$\hat{x} = \begin{cases} \bar{x}_0 & \text{if } x^* < \bar{x}_0 \\ x^* & \text{if } x^* \in [\bar{x}_0, \bar{x}_1] \\ \bar{x}_1 & \text{if } x^* > \bar{x}_1 \end{cases} \quad (11)$$

and let $b(\hat{x})$ denote the associated level of b implied by equation (4).

Subgame following seller's decision to remain silent: duty to read and actual knowledge

Conversely, consider the possible outcomes if the seller does not speak. Under the duty to read, the value of x is then entirely determined by the seller's choice of z . The buyer must then decide whether to read, and his decision will depend on his beliefs about the possible values of x associated with a form offer P . Denote $h(x|P)$ as the generalized probability density function on x (conditional on P and the fact that seller has not spoken) that is induced by applying Bayes' rule to the seller's strategy. Similarly, denote $H(x|P)$ as the associated generalized cumulative density function on x , conditional on P and the fact that seller has not spoken. Additionally, denote $b(x, P)$ as the marginal type of buyer who would be just willing to accept (P, x) if fully informed: $b(x, P) \equiv (V - P)/c(x)$. Also denote $x(b, P)$ as the reservation level of quality just sufficient to induce a fully informed buyer of type b to accept an offer at price P : $x(b, P) \equiv c^{-1}(\frac{V-P}{b})$.

Given this framework, the buyer's payoffs from responding to a form offer P are as follows: he can decline and earn U_d , he can accept and expect to earn U_a , or he can read and expect to earn U_r , where:

$$U_d = 0 \quad (12)$$

$$U_a = V - P - b \int_{\bar{x}_0}^{\bar{x}_1} c(x) dH(x|P) \quad (13)$$

$$U_r = -R + \int_{x(b)}^{\bar{x}_1} [V - P - bc(x)] dH(x|P) \quad (14)$$

The first key observation is that buyers' preferences over these three alternatives are strictly monotonic in the buyer's type. This implies that for any given offer, the sets of buyer types who want to accept, to read, or to reject the offer are disjoint and strictly ordered by type.

LEMMA 1. *Following a form offer:*

(a) *If buyer type b is indifferent between accepting and declining, then all types $t > b$ ($t < b$) strictly prefer to decline (accept).*

(b) *If buyer type b is indifferent between reading and declining, then all types $t > b$ ($t < b$) strictly prefer to decline (read).*

(c) *If buyer type b is indifferent between accepting and reading, then all types $t > b$ ($t < b$) strictly prefer to read (accept).*

PROOF: (a) Suppose $U_a(b, P) = 0$. Then:

$$U_a(t, P) = (b - t) \int_{\bar{x}_0}^{\bar{x}_1} c(x) dH(x|P) < 0 \quad \text{when } t > b.$$

(b) Suppose $U_r(b, P) = 0$. Then there must be some positive probability weight on $h(x|P)$ in the interval $[x(b), \bar{x}_1]$. Then:

$$U_r(t, P) = \int_{x(t)}^{\bar{x}_1} (b - t)c(x) dH(x|P) - \int_{x(b)}^{x(t)} [V - P - bc(x)] dH(x|P) < 0 \quad \text{when } t > b.$$

(c) Suppose $U_a(b, P) - U_r(b, P) = R + \int_{\bar{x}_0}^{x(b)} [V - P - bc(x)] dH(x|P) = 0$. Then there must be some positive probability weight on $h(x|P)$ in the interval $[\bar{x}_0, x(b)]$. Then:

$$\begin{aligned} U_a(t, P) - U_r(t, P) &= \int_{\bar{x}_0}^{x(b)} (b - t)c(x) dH(x|P) \\ &\quad + \int_{x(b)}^{x(t)} [V - P - tc(x)] dH(x|P) < 0 \quad \text{when } t > b. \parallel \end{aligned}$$

COROLLARY: For any seller's strategy and form offer with price P , there exist marginal types $\hat{b} \leq \bar{b}$ such that: (a) all types $t \in [b_0, \hat{b}]$ accept; (b) all types $t \in (\bar{b}, b_1]$ reject; (c) all types $t \in (\hat{b}, \bar{b}]$ read.

Note that for particular values of $h(x|P)$ and P , any of the sets of types who read, reject, or accept may be empty.

From the Corollary, a second key observation follows. The only outcomes consistent with a form offer in equilibrium result in no communication. Buyers do not read, and sellers choose the lowest quality level allowed by law.

LEMMA 2. *In any equilibrium following a form offer, no buyer reads, and the seller chooses the lowest quality level allowed by law along with the price that maximizes profits given minimum quality.*

PROOF: Take P as given, and assume that some buyers read in equilibrium, so that $\hat{b} < \bar{b}$. This leads to a contradiction, for then the seller wishes to choose x to maximize $\pi(x)$. It follows for the maximizing choice, \hat{x} , that $b(\hat{x}) \leq \bar{b}$. But then the buyer's payoff from reading is at most $-R + V - P - bc(x(\hat{b}))$. This payoff is strictly negative for all types t within some finite neighborhood $[\hat{b} - \epsilon, \hat{b}]$. These types of buyers would be better off rejecting the offer. So reading cannot be their equilibrium strategy, which contradicts our assumption that it was. This establishes the first part of the lemma. But then, if no buyer reads, it pays the seller to choose minimum quality $x = \bar{x}_0$ whatever the price P . If sellers always choose minimum quality, the buyers learn nothing from reading. Thus no reading and minimum quality are consistent with equilibrium. Now, consider any situation where $x = \bar{x}_0$ and $\rho = 0$ and suppose $P \neq P^* \equiv \operatorname{argmax} [P - ak(\bar{x}_0)]F(\frac{V-P}{c(\bar{x}_0)})$. This cannot be an equilibrium, for the seller can increase his profits by deviating to P^* .¹⁰ On the other hand, $P = P^*$ is supportable as an equilibrium so long as the buyer would believe that $x = \bar{x}_0$ following any other choice of P . ||

The intuition underlying Lemma 2 is that once the buyer reads a form offer, his cost of reading is sunk, and vulnerable to *ex post* rent-seeking. If there are any buyers who do read, then among them there must be one who values quality most. The seller, recognizing this, wants to choose quality no higher than the level that makes the most quality-sensitive reader just willing to buy. To do otherwise would increase the seller's unit cost without increasing his expected sales. But if the most quality-sensitive reader is indifferent about buying once informed, then he would have been better off not reading in the first place. Thus he drops out of the group of readers, but then the argument can be repeated with the most quality-sensitive buyer among those remaining. Accordingly, there does not exist a most quality-sensitive buyer among the set of buyers who read, so the set of buyers who read is empty.

And, if no one will read a form offer, then all types of sellers should always choose minimum quality. Of course, if the seller always chooses the lowest possible quality, it is then optimal for all buyers not to read, and to accept if and only if $P \leq V - bc(\bar{x}_0)$. The seller should then choose the profit-maximizing price associated with minimum quality being common knowledge.

¹⁰Since x is already at the minimum allowed level, the buyer cannot infer a quality reduction from the deviation.

This result seems very powerful, and the later analysis depends upon it, so it is worth some discussion. The logic is similar to that of Diamond (1971), who argued that buyers uninformed about market price will not wish to engage in any search in an otherwise competitive market, because the costs sunk in doing so are subject to *ex post* appropriation. Fudenberg and Tirole (1985) extend the argument to the game-theoretic context. The argument is potentially of wide applicability. Bagnoli and Khanna (1987) apply the same insight in a recent working paper to explain why real estate agents are hired by sellers but not buyers.

The result depends primarily on two assumptions. First, the level of x must be continuously adjustable, or nearly so, else it will not necessarily be the case that the seller wishes to set x no lower than the reservation level of the most quality-sensitive reader. Continuous quality is a plausible assumption for many contract attributes, such as warranties or liquidated damage clauses, but other attributes may be available only at discrete levels, such as all or nothing. For example, a contract may provide that disputes are to be settled by commercial arbitration rather than by the courts, which typically is in the interest of merchants but not of consumers. Since there is no intermediate form of dispute resolution, the seller will not necessarily choose any buyer's reservation level.¹¹ A different model, therefore, is required to analyze form-contract bargaining regarding such attributes.

Second, it must be the case that the parties' interests are strictly adverse, so that all types of sellers prefer to choose minimum quality when buyers do not read. If sellers differed in their preferred level of x , it might pay buyers to read form contracts to see which type of seller they are dealing with. Conversely, if some sellers actually preferred higher quality, they might wish to choose x above the reservation level of the most quality-sensitive reader. In this case the equilibrium could involve some reading by buyers.¹² For contract attributes such as warranties, it is plausible to assume that increases in quality always increase the seller's cost. But for other attributes, such as the timing of delivery, or arbitration when both parties are merchants, the interests of at least some buyers and sellers may not be opposed. Again, a different model is required to analyze

¹¹If probabilistic terms are allowed, all attributes become continuously adjustable, and the force of this objection is diminished. For instance, a contract might provide for arbitration with probability p and no arbitration with probability $1 - p$. Such terms are not observed in practice, but ambiguous contract language that is open to multiple interpretations may serve much the same purpose.

¹²As the foregoing should indicate, not reading is still the only equilibrium when all sellers have the same preferred level of x , even if that preferred level is above the legal minimum or even above the preferences of some buyers. Any buyer with a reservation quality level below the seller's ideal level would do better to accept than to read; any buyer with a reservation quality above the seller's ideal level would do better to reject than to read.

form-contract bargaining in such cases.¹³

The analysis of the actual knowledge rule follows along exactly the same lines as that of the duty to read. For any given offer P , if the seller chooses not to speak, both buyer and seller are then in the same position they would be in under the duty to read. Accordingly, a full description of the actual knowledge rule is omitted here. As with the duty to read, the only possible equilibrium outcome following a form offer is when $x = \bar{x}_0$ and no buyer reads. Just as with the duty to read, the seller wants to choose the monopoly price associated with $x = \bar{x}_0$.

Subgame following seller's decision to remain silent: duty to speak and irrebuttable presumption

Both the duty to speak and an irrebuttable presumption remove the seller's discretion to choose x following a form offer. Instead, the seller must set $x = \bar{x}$. This makes these rules much simpler to analyze than the duty to read or actual knowledge rules, since the effects of asymmetric information are eliminated. Given \bar{x} , the seller chooses b to maximize $[V - bc(\bar{x}) - ak(\bar{x})]F(b)$. Denote the outcome of this choice as $b(\bar{x})$, the profit maximizing level of b given \bar{x} . It is worth noting at this point the effect on expected quantity of changes in the presumptive level \bar{x} . Implicitly differentiating (4) yields:

$$\frac{\partial b}{\partial \bar{x}} = - \frac{\partial^2 \pi / \partial b \partial x}{\partial^2 \pi / \partial b^2}$$

and from (8), it follows that $b'(\bar{x}) > 0$ whenever $\bar{x} \leq x^*$. Raising the presumptive quality level increases expected quantity if the presumptive quality is set less than the level that would maximize the seller's profit under full information.

Equilibria under various legal rules

Thus far we have only discussed the possible outcomes of the subgames that follow either form offers or full-information offers. The equilibria of the full bargaining games are found by comparing the possible outcomes when the seller does not speak to the full-information outcome when the seller does speak. If the seller speaks, he earns the profits associated with his profit-maximizing quality level. If he does not speak, he earns the lesser profits associated with either the presumptive

¹³The assumption that reading expenditure is discrete is not essential to the result. If it were possible to spend a variable amount on reading and acquire a variable amount of information, one could still show as above that the assumption of a most quality-sensitive reader leads to a contradiction.

quality level that he is legally required to choose under the duty to speak, or the minimum quality level that he is driven to choose in Nash equilibrium under the duty to read. The seller will speak if and only if the increase in profits from speaking exceed the costs of doing so.

The first major result is that under the duty to read, no one reads. The same is true under the actual knowledge rule. The seller will speak if and only if the cost of doing so is sufficiently low.

PROPOSITION 1. *The unique equilibrium under the duty to read is whichever of two outcomes is more profitable for the seller: either $x = \bar{x}_0, b = b(\bar{x}_0)$, and $\sigma = 0$, or $x = \hat{x}, b = b(\hat{x})$, and $\sigma = 1$.*

PROOF: It is plain from the above discussion that these two outcomes, and probability mixtures between them, are the only candidates for equilibria. Denote as $\pi^*(x)$ the maximum profit that can be earned from quality x when buyers are aware of the level of x . Denote the seller's profit from any given strategy (x, b, σ) as $\pi(x, b, \sigma)$. Then it follows that $\pi(\bar{x}_0, b(\bar{x}_0), 0) = \pi^*(\bar{x}_0)$, and $\pi(\hat{x}, b(\hat{x}), 1) = \pi^*(\hat{x}) - S$. Suppose that $\pi^*(\bar{x}_0) < \pi^*(\hat{x}) - S$. Then the seller would not choose $(\bar{x}_0, b(\bar{x}_0), 0)$ with any positive probability in equilibrium, for he can switch to $(\hat{x}, b(\hat{x}), 1)$ and earn $\pi^*(\hat{x}) - S$. In this case, $(\hat{x}, b(\hat{x}), 1)$ is an equilibrium; the out-of-equilibrium beliefs supporting it are just for the buyer to believe $x = \bar{x}_0$ in the event of a form offer. Conversely, suppose that $\pi^*(\bar{x}_0) > \pi^*(\hat{x}) - S$. Then the seller cannot choose $(\hat{x}, b(\hat{x}), 1)$ with positive probability in equilibrium, for he can switch to $(\bar{x}_0, b(\bar{x}_0), 0)$ and earn at least $\pi^*(\bar{x}_0)$ (and possibly more if the buyer's beliefs are more optimistic). In this case, $(\bar{x}_0, b(\bar{x}_0), 0)$ is an equilibrium; the out-of-equilibrium beliefs supporting it are just for the buyer to believe $x = \hat{x}$ in the event of any other form offer. ||

COROLLARY 1: *Under the duty to read, no buyer ever reads in equilibrium.*

COROLLARY 2: *Under the duty to read, seller provides the full-information profit-maximizing quality level and speaks when the cost of speaking, S , is below a threshold level, and provides the minimum quality level and remains silent when S is above the threshold.*

PROPOSITION 2. *The unique equilibrium under the actual knowledge rule is identical to the equilibrium under the duty to read.*

PROOF: Analogous to proof of Proposition 1. ||

The second major result is that no one reads under the duty to speak either, and again the seller speaks if and only if the cost of doing so is sufficiently low.

PROPOSITION 3. *Under the duty to speak, the unique equilibrium is whichever of two possible outcomes is more profitable for the seller: either $x = \bar{x}$, $b = b(\bar{x})$, and $\sigma = 0$, or $x = \hat{x}$, $b = b(\hat{x})$, and $\sigma = 1$.*

PROOF: This is even easier than the proofs of Propositions 1 and 2, since the presumption that $x = \bar{x}$ when the seller is silent means that the game is one of full information, and it is not necessary to keep track of any out-of-equilibrium beliefs. As the previous discussion indicates, the two outcomes are the only possible equilibria, and the seller has the incentive and the ability to deviate to whichever one is more profitable for him. ||

COROLLARY 3: *Under the duty to speak, seller provides the full-information profit-maximizing quality level and speaks when the cost of speaking, S , is below a threshold level, and provides the legally presumed quality level and remains silent when S is above the threshold.*

It follows from a comparison of Propositions 1 and 3 that the practical differences between the duty to read and the duty to speak may be less than legal commentators have commonly supposed.

COROLLARY 4. *A duty to read rule, combined with a restriction that seller not set quality below some minimum level, yields the identical equilibrium outcome as a duty to speak rule that implies that same minimum level from the seller's silence.*

Corollary 4 is an equivalence theorem relating the possible interpretation rules. In particular, the only aspects of the law that matter for equilibrium outcomes are the level of quality legally implied from the seller's silence, \bar{x} , and the minimum level of quality allowed, \bar{x}_0 . It does not matter which party formally bears the risk that the contract terms are not communicated to the buyer. Similarly, only the levels of \bar{x} and \bar{x}_0 can affect the level of social welfare, as I discuss in the next section. This observation refutes a number of arguments advanced by legal commentators on the subject of interpretation rules. For instance, it is decidedly not the case that the duty to read is preferable to the duty to speak if and only if the cost of reading is less than the cost of speaking, as has occasionally been suggested.¹⁴ The foregoing analysis shows that even if R is substantially less than S , all communication must be achieved through the seller's efforts.

Under the mandatory terms regime, of course, the seller always chooses $x = \bar{x}$, and since he must do this in any event, he will not want to spend any resources by speaking; similarly, the buyer will not read. This in itself is not worth special mention, but as it completes the survey of all the possible interpretative rules one can observe:

¹⁴See, e.g., Posner (1977: pp. 85-86), suggesting the test for enforcing fine-print clauses be "... whether the wording, placement, or format of the clause is such as to impose excessive search costs on prospective customers."

PROPOSITION 4. *Under no rule of interpretation will the buyer read a form offer in equilibrium.*

Comments on varying the assumptions

Recall that we have been assuming that when seller speaks, buyer learns the value of x with zero expenditure. The consequences of dropping this assumption should now be apparent. If one assumes that speaking lowers the buyer's cost of information but does not reduce it to zero, then buyers will never choose to acquire any information in equilibrium, on precisely the same logic as that used above to derive Lemma 2 and Proposition 1. Since buyers will ignore sellers' informational efforts, then, sellers will not waste any resources in attempting to speak. It then follows that the unique equilibrium under the duty to read is when $x = \bar{x}_0$, $b = b(\bar{x}_0)$, and $\sigma = 0$, and the unique equilibrium under the duty to speak is when $x = \bar{x}$, $b = b(\bar{x})$, and $\sigma = 0$. The equivalence results of Corollary 4 and Proposition 2 would still hold true; so would the no-reading result of Proposition 4.

Additionally, I have been assuming throughout that the penalties for breach of contract are sufficiently high and certain that if the seller is legally obligated to provide some level of quality x , he actually does provide that level of quality. What this means, somewhat unrealistically, is that there will be no contract breaches regarding quality. One might prefer to assume that the damages payable in the event of breach by shipment of nonconforming goods are determined by the *expectation measure*, that is, that the seller must pay the buyer the difference between the value of the good as promised and its value as delivered.¹⁵ In theory, the expectation measure should vary with the buyer's type, although the tribunal charged with enforcing the contract may not be able in practice to observe that type. If the buyer's type is observable *ex post*, however, and if enforcement is costless, the seller will not need to speak.

More precisely, suppose that the legally implied quality level is \bar{x} , but the seller breaches the contract by supplying a lesser quality x . Under the expectation measure, damages following breach are equal to $D(b, x) \equiv b[c(x) - c(\bar{x})]$. If buyers anticipate the damage award, they should be willing to pay exactly $V - bc(\bar{x})$ for a unit of the good. The seller's problem then becomes:

$$\begin{aligned} \max_{b,x} \pi &= [V - bc(\bar{x}) - ak(x) - D(b, x)]F(b) \\ &= [V - bc(x) - ak(x)]F(b) \end{aligned} \tag{15}$$

¹⁵See, e.g., Uniform Commercial Code §2-714, "Buyer's Damages for Breach in Regard to Accepted Goods," which applies the difference-in-value rule to breach of warranty cases.

which is identical to the problem (2) when quality has been communicated. For problem (2), however, the seller must spend S to speak, and here in contrast no such expenditure is necessary. In this setting, costless *ex post* enforcement of the contract is a perfect substitute for full information *ex ante*. In reality, of course, *ex post* enforcement is costly and courts are unable or unwilling to tailor expectation damages to the buyer's personal circumstances, so sellers may need to speak. When *ex post* enforcement is relatively cheap, however, one might expect to see it used rather than seeing sellers speak *ex ante*.

I have also ignored the possibility that a seller's concern for his reputation may lead him to choose a level of x above the minimum \bar{x}_0 , even if no buyer reads the fine print. In a multiperiod setting, buyers' disappointment with contract terms may lead them to punish the seller by withholding future business; this may be viewed as a form of private enforcement. There are no reputations in this model, unless one is willing to attach the term to buyers' rational expectations about a sellers' strategies. Several authors have argued (e.g., Klein and Leffler (1981), Shapiro (1982)) that sellers' reputational concerns can substitute for buyers' information. It is generally the case in finite-time reputational models, however, that the equilibrium existence of reputations requires that buyers have some uncertainty about the seller's preferences.¹⁶ Here, since buyers know that all sellers would prefer to set $x = \bar{x}_0$, a reputation for setting quality above the legal minimum may not be credible. Nonetheless, my analysis might usefully be supplemented with reputational arguments before applying it to actual policy decisions.

3. Welfare analysis

As the previous section showed, the welfare consequences of the various legal rules depend solely on the minimum level of x that the law implies from the seller's silence. In this section, I therefore abstract from the differences among legal rules, and focus on this minimum level. Let us change the notation slightly from that of the previous section, and refer to the minimum level as \bar{x} . In order to characterize its Pareto optimal value, it is necessary to evaluate the efficiency of the seller's choice of x when communication is costless.

¹⁶For a fuller analysis of this point, see Wilson (1985).

Quality choice when seller speaks

If the seller ever speaks, he will want to choose $x = x^*$ if the legal rule allows it; assume for the moment that it does. Since the seller is a monopolist, his choice of b is clearly suboptimal. Is x^* the optimal level of x , however? Maximizing social welfare requires us to solve the problem:

$$\max_{b,x} W = \int_{t=b_0}^b [V - tc(x) - ak(x)] dF(t) \quad (16)$$

This problem was analyzed by Spence (1977), who showed that for any constant quantity of sales, the monopolist chooses excessive quality if and only if the marginal consumer's marginal willingness to pay for quality is greater than the average consumer's marginal willingness to pay for quality. One way of viewing the intuition underlying Spence's result is that when marginal consumers have relatively high demand for quality, increases in quality make the demand curve more elastic, so that the seller is able to capture a larger portion of consumer surplus. The prospect of capturing a larger portion of surplus leads the firm to increase quality beyond the efficient level.

In the present model, since consumers differ only in the intensity of their preference for x , the marginal consumer's willingness to pay for quality is greater than that of all inframarginal consumers. So holding quantity constant, the seller actually provides too much x — an inefficient result, but the reverse of the standard concerns of the legal commentators.

To demonstrate this, consider the social planner's problem (16), which has first-order conditions:

$$\frac{\partial W}{\partial x} = -ak'(x)F(b) - c'(x) \int_{t=b_0}^b t dF(t) = 0 \quad (17)$$

$$\frac{\partial W}{\partial b} = [V - bc(x) - ak(x)]f(b) = 0 \quad (18)$$

Comparing (4) and (18), we get $\partial W/\partial b > \partial\pi/\partial b$, indicating the standard monopolistic quantity restriction. More interestingly, a comparison of (3) and (17) shows that $\partial W/\partial x - \partial\pi/\partial x = c'(x) \int_{t=b_0}^b (b-t) dF(t) < 0$. This is just Spence's result: the marginal increase in social welfare from increased quality is less than the marginal increase in profits, because the benefit to the marginal consumer from a marginal increase in quality, captured by the seller in the form of an increased price, is greater than the average benefit to inframarginal consumers.¹⁷

¹⁷A similar analysis, which focuses primarily on contrasting price, quality, and quantity regulation, is found in Sheshinski (1976).

This welfare comparison is probably not the relevant one to draw for policy purposes, however, since the monopolist does choose to vary quantity (or in our framework, the marginal type b) when quality changes. This does not change the marginal effect of quality on profits, of course, because quantity is already chosen to maximize profits. The marginal effect of quality on social welfare does change, however, when we take into account the interaction between quality and quantity. From the standpoint of the second-best, it may be desirable for the monopolist to increase quality above what would otherwise be the optimal level, in order to reduce the excess burden of monopoly pricing.

So consider the position of a regulator faced with the following second-best problem: it cannot regulate price, but can set the level of x , or can set rules that influence the choice of x . A court applying contract interpretation rules is generally in this position. Its formal decision problem is to maximize social welfare W subject to the seller's first-order condition (4). Denote the solution to this constrained problem as x^{**} .

Given that the seller is free to choose b , welfare increases with x at the rate $dW/dx = \partial W/\partial x + (\partial W/\partial b)(\partial b/\partial x)$. Furthermore, differentiation of (18) yields:

$$\frac{\partial^2 W}{\partial b \partial x} = [-bc'(x) - ak'(x)]f(b) - c'(x)F(b) \quad (19)$$

which is unambiguously positive for $x \leq x^*$. Combining (4), (17), (18), and (19), and noting that $d\pi/dx = \partial\pi/\partial x$ by the envelope theorem, we get:

$$\frac{dW}{dx} = \frac{d\pi}{dx} \left[1 - \frac{c(x)f(b)}{\partial^2\pi/\partial b^2} \right] + c'(x) \left[\int_{b_0}^b (b-t) dF(t) + \frac{c(x)F^2(b)}{\partial^2\pi/\partial b^2} \right] \quad (20)$$

Let \hat{b} denote the average type of the consumers who actually buy, i.e.:

$$\hat{b} \equiv \frac{\int_{b_0}^b t dF(t)}{F(b)}$$

Then we can rewrite (20) as:

$$\frac{dW}{dx} = \frac{d\pi}{dx} \left[1 - \frac{1}{\left(\frac{F(b)f'(b)}{f^2(b)} - 2 \right)} \right] + c'(x)F(b) \left[(b - \hat{b}) + \frac{F(b)/f(b)}{\left(\frac{F(b)f'(b)}{f^2(b)} - 2 \right)} \right] \quad (21)$$

I assume that the second-order conditions for a welfare maximum are satisfied. To evaluate the second-best efficiency of the seller's quality choice, then, we need to evaluate dW/dx at the seller's maximum x^* . At this quality level:

$$\begin{aligned} \frac{dW}{dx} &= c'(x)F(b)(b - \hat{b}) + \frac{c'(x)F^2(b)/f(b)}{\left(\frac{F(b)f'(b)}{f^2(b)} - 2 \right)} \\ &= c'(x)F(b)(b - \hat{b}) + c(x)F(b)\frac{db}{dx} \end{aligned} \quad (22)$$

The total marginal effect on welfare of increased quality is of ambiguous sign. The first term of (22) is negative. It reflects the effect identified by Spence, in which a difference between the marginal and average consumer's willingness to pay for quality leads to an oversupply of quality. The second term of (22) is positive; it reflects the reduction in monopoly deadweight loss resulting from the interaction between quality and quantity. Whether the seller's quality choice is too high or too low depends upon which of these offsetting effects is dominant.

It is difficult to draw any general conclusions regarding the relative magnitude of the two effects. For a special but nontrivial class of distributions over types of buyers, however, it is possible to simplify the expression (21). Specifically, one can show for $F(b) \in F_n(b)$, the family of distribution functions discussed above, that the seller's quality choice is second-best optimal. For this family of expected demand curves, in fact, (21) reduces to:

$$\frac{dW}{dx} = \frac{d\pi}{dx} \left[1 + \frac{n}{n+1} \right]. \quad (23)$$

To see this, notice that for all $F(b) \in F_n(b)$, one can show $\hat{b} = (b_0 + nb)/(n+1)$. Using the fact that $\left(\frac{F(b)f'(b)}{f^2(b)} - 2 \right) = -(n+1)/n$, it follows that the expression in (22) equals 0 for any value of b . To summarize:

LEMMA 3. *If quality x is costlessly observable, and if the cumulative distribution of buyers' types is of the form $F(b) = \left(\frac{b-b_0}{b_1-b_0} \right)^n$, a social planner unable to regulate price will not wish to regulate quality.*

PROOF: By algebraic manipulation of (21) and (22). ||

When $F(b)$ is of the form $F_n(b)$, any change in x that raises the seller's profits will also raise social welfare. Moreover, since the coefficient of $d\pi/dx$ in (23) is greater than 1, movements in x change welfare by a proportionally larger amount than they do profits. This just means that the seller is unable to capture the full amount of consumer surplus.

The balance of this section will concentrate on the case where $F(b) \in F_n(b)$. Otherwise, all conclusions regarding the optimal rule of interpretation will be governed by second-best considerations of how the interpretation rule interacts with quantity decisions, and few generalizations can be drawn. Since my focus in this paper is on how interpretative rules can affect and help overcome the problems of costly communication, however, it is useful and important to examine the benchmark situation in which costless communication is second-best optimal. In any event, the preceding discussion suggests that this will be the case in perhaps a wider class of cases than some might have expected. So to be explicit, let us assume:

ASSUMPTION. *The cumulative distribution of buyers is of the form $F(b) = \left(\frac{b-b_0}{b_1-b_0}\right)^n$.*

Consider then the choice of the presumptive level \bar{x} , and whether it should be made mandatory. Denote $W(x)$ as the level of social welfare associated with a particular level x , given that the seller is choosing b to maximize profits. Let us now allow the legal limits $[\bar{x}_0, \bar{x}_1]$ again to restrict the choice of x . Recall that the seller will either speak and choose his constrained maximum \hat{x} , or remain silent and accept the presumptive quality \bar{x} . From (23) it follows that:

$$W(\hat{x}) - W(\bar{x}) = (\pi(\hat{x}) - \pi(\bar{x})) \left(\frac{2n+1}{n+1}\right) > \pi(\hat{x}) - \pi(\bar{x}) \quad (24)$$

If $\hat{x} \neq \bar{x}$, the seller will want to choose \hat{x} rather than \bar{x} whenever $\pi(\hat{x}) - \pi(\bar{x}) > S$. But if the gain in profits exceed the cost of speaking, then the gain in welfare must also exceed the cost of speaking. It immediately follows that any limits on the choice of x are suboptimal, since if $\pi(x^*) > \pi(\hat{x})$, then $W(x^*) > W(\hat{x})$. In fact, it is possible for the cost of speaking to exceed the increase in profits from speaking, but to be less than the increase in social welfare, so that society might want to subsidize sellers' communication efforts. This suggests a number of policy implications. First, when all sellers are of the same type, it is possible to choose the interpretative rule to avoid all social and private costs of communication. In this case we obtain the second-best outcome, subject only to the deadweight loss from monopoly.

PROPOSITION 5. *If there is only one type of seller, the optimal rule of interpretation is for the presumptive level \bar{x} to be set equal to the level x^* that the seller would wish to choose if communication were costless. Such a rule induces the optimal level of quality without incurring any costs of communication.*

PROOF: If there is only one type a of seller, then the full-information profit-maximizing level x^* is identical for all sellers. It follows that the social cost associated with any presumptive level \bar{x} is just $\min[S, W(x^*) - W(\bar{x})]$. Obviously, this is greater than zero if $\bar{x} \neq x^*$, and is minimized at $\bar{x} = x^*$, where it equals zero. ||

An unrestricted duty to read, commonly said to be the traditional rule of the Anglo-American common law, sets the presumptive quality level at zero, and is clearly suboptimal. The optimal rule, in contrast, takes the form of an implied promise that the level of x is at the full-information optimal level x^* . Various statutory provisions of modern contract law can be interpreted as implying such promises. Our analysis lends some support to these modern provisions on grounds of efficiency.¹⁸

¹⁸For example, Uniform Commercial Code §§2-314 and 2-315, in force in all American jurisdictions, provide implied warranties of merchantability and fitness in contracts for the sale of goods. Under §2-316, disclaimers by the seller must be conspicuous and in writing.

Actually, with only one type of seller, it does not matter whether the quality level \bar{x} is merely presumed from silence or absolutely required. When there are many types of sellers, however, it is no longer possible to reach the second-best outcome with a single level \bar{x} , since the optimal value of quality varies with the seller's type. If courts were able costlessly to distinguish among various types of sellers *ex post*, of course, the second-best might still be obtained, but this seems an unlikely possibility. In this case, depending on the size of S , some sellers will choose to live with the suboptimal level \bar{x} , and some will choose to spend S and choose their optimal level $x^*(a)$, assuming they are permitted to do so and assuming the cost of speaking is not so prohibitively high as to force all sellers to live with \bar{x} . It should be apparent that:

PROPOSITION 6. *It is weakly suboptimal to require sellers to adhere to a required quality level.*

PROOF: By inspection of equation (24). ||

An absolute requirement is not strictly suboptimal because the cost of speaking may be sufficiently high relative to $\pi(x^*) - \pi(\bar{x})$ that sellers will not wish to speak. If an individual seller wishes to choose a different quality level and speak, however, he increases social welfare by doing so.

The optimal level of \bar{x} when there are many types of sellers is more difficult to characterize. It is possible at least to say that if speaking is sufficiently expensive, then an implied warranty is the best rule.

PROPOSITION 7. *If the cost of speaking is sufficiently high to deter all speaking, then the optimal rule sets the presumptive quality level \bar{x} between the favored level of the lowest-cost seller, $x^*(a_0)$, and the favored level of the highest-cost seller, $x^*(a_1)$.*

PROOF: This is true because, if no seller wants to speak, then the increase in social welfare from increasing \bar{x} is just:

$$\frac{dW^*}{d\bar{x}} = \int_{a=a_0}^{a_1} \frac{\partial \pi(a)}{\partial x} dG(a).$$

It follows from straightforward comparative statics on the seller's first-order-conditions (3) and (4) that:

$$\frac{dx^*}{da} = \frac{-\frac{\partial^2 \pi}{\partial x \partial b} k(x) f(b) + \frac{\partial^2 \pi}{\partial b^2} k'(x) F(b)}{\frac{\partial^2 \pi}{\partial b^2} \frac{\partial^2 \pi}{\partial x^2} - \frac{\partial^2 \pi}{\partial b \partial x}^2} < 0 \quad (25)$$

$$\frac{db^*}{da} = \frac{\frac{\partial^2 \pi}{\partial x^2} k(x) f(b) - \frac{\partial^2 \pi}{\partial x \partial b} k'(x) F(b)}{\frac{\partial^2 \pi}{\partial b^2} \frac{\partial^2 \pi}{\partial x^2} - \frac{\partial^2 \pi}{\partial b \partial x}^2} < 0 \quad (26)$$

since $\partial^2\pi/\partial x\partial b = -c'(x)F(b) > 0$ when $x = x^*$. Just as one would expect, a seller with higher cost of providing quality would prefer to choose lower quality and lower quantity. From (25), it follows that $x^*(a) \in [x^*(a_1), x^*(a_0)]$, for any type a . Given the second-order conditions, $\partial\pi/\partial x > 0$ if and only if $x < x^*$, so dW^*/dx is positive when $\bar{x} \leq x^*(a_1)$ and negative when $\bar{x} \geq x^*(a_0)$. ||

COROLLARY 5. *If buyers cannot costlessly observe quality when sellers speak, then the optimal rule sets the presumptive quality level \bar{x} between the favored level of the lowest-cost seller, $x^*(a_0)$, and the favored level of the highest-cost seller, $x^*(a_1)$.*

Remember from above that if we drop the assumption that when seller speaks, buyers learn the value of x with zero expenditure, then it follows that buyers will ignore sellers' words and sellers will never speak. Thus it is desirable to set \bar{x} between the optimal quality choices of the highest-cost and lowest-sellers.

Unfortunately, Proposition 7 need not generally hold when speaking takes place in equilibrium. This is because for any level \bar{x} , there are some types a who do not speak but who would increase social welfare if they did speak. Any decrease in \bar{x} below $x^*(a_0)$ or increase above $x^*(a_1)$ reduces the profits of all nonspeaking firms, and hence reduces social welfare; this is the reasoning of the Proposition. But such a change also causes the marginal seller type who is indifferent between speaking and silence to switch to speaking, and this switch yields an offsetting welfare gain of $\left(\frac{nS}{n+1}\right)g(a)$. The net effect is of ambiguous sign, so it is possible that it is best to set the presumptive level at a level that suits no one. I have not even been able to rule out the possibility that the traditional unlimited duty to read is the best rule in this circumstance, nor have I ruled out the possibility that a full warranty is the best rule.

If, however, we are not restricted to a single level of \bar{x} in all circumstances, it may be possible to do better. In particular, suppose that the legally implied quality level can depend on the price specified in the offer. This would seem consistent with ordinary commercial understanding, since higher priced goods are commonly expected to be of higher quality. The law of implied warranties recognizes this understanding in practice.¹⁹ With one additional assumption, it is possible again to reach the second-best outcome. Let $P^*(a)$ denote the price that would be charged by a seller of type a under conditions of costless communication: $P^*(a) \equiv V - b^*(a)c(x^*(a))$

¹⁹ As Official Comment 7 to Uniform Commercial Code §2-314 declares, "... In cases of doubt as to what quality is intended, the price at which a merchant closes a contract is an excellent index of the nature and scope of his obligation under the present section."

ASSUMPTION. $P^*(a)$ is a strictly monotonic function of a .

We noted earlier that with costless communication, increases in a lead a seller to choose both lower quality and lower quantity. The quantity and quality changes, however, have offsetting effects on price. This last assumption states that the price that would be chosen when contract terms are costlessly observable is either strictly increasing or strictly decreasing in the seller's type. Making it entails a considerable loss of generality, and unfortunately I have been unable simply to characterize the conditions under which it generally holds. If it does hold, however, it is possible to design a rule that avoids all inefficiencies aside from the deadweight loss from monopoly pricing. The rule that achieves this takes a simple and intuitive form: just ascribe to an offer of price P the quality level that would be found in a good of that price if observing quality were costless.

PROPOSITION 8. *If the costless-communication price P^* is strictly monotonic in the seller's type a , then the optimal rule of interpretation is for the presumptive level $\bar{x}(P)$ to be set equal to the level $x^*(a(P))$ that would be chosen by the seller of type $a(P)$ if communication were costless, where $a(P)$ is the type of seller who would choose P if communication were costless. Such a rule induces the optimal level of quality in all transactions without incurring any costs of communication.*

PROOF: Since $P^*(a)$ is strictly monotonic, its inverse function $a(P)$ exists and is also strictly monotonic. It follows that the function $\bar{x}(P) = x^*(a(P))$ also exists and is strictly monotonic. The interpretation rule based on $\bar{x}(P)$ invites a seller of type a to choose among a menu of (P, x) combinations, each selection of which is the ideal combination of (P, x) for some type of a when communication is costless. Since his own ideal combination $(P^*(a), x^*(a))$ is on the menu, he chooses it. But this is socially optimal in the second-best sense. ||

Proposition 8 can also be interpreted as establishing the existence of a truth-revealing mechanism. The rule $\bar{x}(P) = x^*(a(P))$ tells the seller that he can claim to be of any type a' , but that he must then choose the combination $(P^*(a'), x^*(a'))$ that type a' would choose if communication were costless. Since his profits under this mechanism are maximized at $a' = a$, he is induced to tell the truth about his type. This enables the law to imply the optimal quality level $x^*(a)$. This suggests why we need $P^*(a)$ to be strictly monotonic for Proposition 8 to hold. Otherwise P is not a sufficient statistic for the seller's type a , and no rule based solely on P can induce each seller truthfully to reveal either his type a or his optimal quality level $x^*(a)$. More concretely, if there are two types a, a' who would choose the same price P , then the lawmaker cannot know whether the correct warranty level is $x^*(a)$ or $x^*(a')$, and cannot reach the second-best.²⁰ For the general

²⁰Since quantity is strictly decreasing in seller's type, under costless communication quantity would also be a sufficient

case, then, whether an implied warranty is better or worse than the traditional duty to read will depend upon a detailed inquiry into the structure of costs, and the distribution of types of buyers and sellers.

4. Conclusions and possible extensions

The preceding analysis demonstrated that, in a context of form-contract bargaining with costly communication, the background rules that govern the interpretation of contracts can affect the terms that are included in contracts, the price and quantity of goods sold, and the level of social welfare. It also showed that, when the interests of buyers and sellers regarding the content of form-contract terms are directly opposed, the traditional common-law rule, which puts the recipient of a form contract under a duty to read and understand all of the terms before assenting, and which binds an assenting recipient to fine-print terms he has not read, will have little effect on whether parties actually read contracts. In fact, no one will read the fine print in contracts in equilibrium. Accordingly, there may be little practical difference between a rule that nominally makes the drafter of the form contract bear the responsibility for communicating its terms, and one that makes the receiving party bear such responsibility. In either case, the expense of any communication will be borne by the drafter. Since the drafter's costs of communication may be less than the reader's, this may lead to excessive communication costs from the viewpoint of the first-best social optimum.

The analysis casts some doubt on the prospect that contract warranties or other similar promises can provide a way around problems of moral hazard or adverse selection in product markets. Because communicating and learning about specific warranties is costly, and because the decision to acquire warranty information necessarily precedes a sale, the prospect of moral hazard can deter market participants even from becoming informed about the terms of exchange.

Accordingly, under a broad class of conditions regarding the distribution of types of buyers and sellers, the traditional duty to read may be Pareto inferior to a rule that provides presumptive

statistic for the seller's type, and one might think that an interpretative rule based on quantity (or the marginal buyer type b) would work similarly. There are two difficulties with such a rule, however. First, the legal decisionmaker may not observe the quantity sold; this is especially problematic if the seller chooses not actual but expected quantity. Second, and more importantly, the buyers will not observe quantity either at the time they purchase; all they can see is price. If two different types of sellers $a < a'$ both have the same ideal price P^* , buyers cannot know from price alone whether to purchase the quantity $F(b^*(a))$ (and get quality $x^*(a)$), or to purchase the lesser quantity $F(b^*(a'))$ (and get lower quality $x^*(a')$). One needs therefore to specify more carefully the strategic interaction among buyers in order to find the equilibrium. For instance, if all buyers act as one, they can (and will want to) guarantee themselves a warranty for the higher quality simply by purchasing the larger quantity. But this is suboptimal when seller is of the higher type a' .

standard terms when parties do not expressly negotiate. It is even possible for the traditional rule to be Pareto inferior to a rule that prohibits all negotiation and supplies mandatory terms, although for this to be the case the effect of the terms chosen must interact with a monopolistic deadweight loss. In a significant class of cases, however, there will be no such interactions.

A number of extensions of and variations on the analysis have been suggested in the body of the paper; several others are worth studying as well. It would be useful to study the effect of interpretation rules on contract terms either when the interests of buyers and sellers are not strictly opposed with respect to such terms, or when only a discrete number of such terms are possible. The game-theoretic interaction arising from these variations may be substantially different from those outlined here. Additionally, it would be useful and interesting to see whether and in what respects the conclusions of the analysis carry over to different market structures such as monopolistic competition.

Finally, the current analysis abstracts entirely from the administrative costs of enforcing contracts. I have assumed throughout that if a substantive legal rule implies a certain contract term, that the term is actually supplied by the seller. But if enforcement is costly or not credible, or if the enforcement authority makes errors, the consequences of substantive legal rules will change. Conceivably, the welfare rankings of the various rules could then be reversed.²¹ The relative ease of administration of the duty to read rule, for instance, is commonly cited as an argument in its favor, and this argument has been excluded from present consideration. A more complete analysis would recognize the complementary relations between substantive and procedural rules in contract law, and the tradeoffs between negotiation *ex ante* and dispute resolution *ex post*. All of these extensions deserve further study.

²¹For a general discussion of this issue, see Polinsky and Shavell (1988).

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