I. Introduction

What social function does the law of contract damages play? The literature, legal and economic, offers several answers, two of which are of particular interest here. In a famous article published in 1963, Stewart Macaulay suggested that contract law might play two roles in exchange transactions.\(^1\) (1) It might promote rational planning of transactions and (2) the existence or use of actual or potential legal sanctions might induce parties to perform. Macaulay then reports results of a study of the role of contract in business exchange; apparently business attended little to contract in the second sense and only attended in the first sense when the value of the exchange was great. More recently Steven Shavell has argued that damages rules substitute for complete contingent claims contracts in which the parties specify the required performance in every state of the world. Since the cost of drafting complete contracts is exorbitant, the law of damages usefully provides the appropriate incentives for promisors when something untoward happens. In a formal model, Shavell shows that expectation damages lead to the appropriate amount of breach although, in the presence of a reliance decision, promisees tend to over-rely.\(^2\)

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\(^1\) I have benefited from the comments of Roy Radner. He is, of course, immune from liability for errors. The research was supported in part by NSF grant SOC 76-14768A01.


Steven Shavell, Damage Measures for Breach of Contract, 11 Bell J. Econ. 466 (1980). The model presented in Section III and analyzed in Section IV infra should be compared to Shavell's results. Shavell examined the performance and reliance decisions in a model without reputation. The model presented here reproduces Shavell's results in the anonymous, risk-neutral world. It also allows comparison to worlds with reputation and extends the analysis to risk-averse worlds. The formulation of the two models does, however, differ. In Shavell's model, the seller decides whether to breach after observing the state of the world, whereas in the model used here the seller chooses a breach rate prior to observing the
Shavell's position is consistent with Macaulay's findings that business may not use contract to plan. The economic analysis, however, is at odds with the finding that business resorts infrequently to contract remedies in its disputes. Macaulay attributes the infrequent use to the availability of informal social sanctions. This paper seeks to formalize Macaulay's insight that the role of contract depends on a variety of factors. In particular, I shall argue that, whether the rule of law "matters" (in a sense to be defined below) depends on (a) the presence of nonlegal market institutions that allow informal "enforcement" of contract terms; (b) the nature of the subject matter of the contract; and (c) the attitudes of the parties toward risk.

The particular nonlegal market institution modeled is one of perfect reputation. A market in which buyers know with certainty the likelihood that the seller with whom they contract will perform is compared to a market in which the buyers know only the likelihood that the "average" seller will not perform. Contracts "between merchants" in a tightly knit community would approximate a market in which perfect reputation prevailed. Tourists shopping for souvenirs, particularly in "open air" markets, would most closely approximate an anonymous market. In many markets, of course, buyers have some information about the reliability of a particular seller but that information is less than complete.

state of the world. In both models, the external effects of search are ignored. In Shavell's model, no price formation rule is given. Nor does he formally consider risk aversion. Finally, Shavell focuses on the choice among three specific damage rules: expectation damages, $\delta = y_1 - y_2$; reliance damages, $\delta = c(a)$; and no damages, $\delta = 0$. William Rogerson, Efficient Reliance and Contract Remedies (Social Science Working Paper no. 340, Cal. Inst. Tech., August 1980), modifies and extends Shavell's model. Like Shavell, Rogerson assumes risk neutrality, no reputation, and the seller choosing to perform or not after the realization of some random variable. Rogerson, however, distinguishes between third-party breach (where a third party offers the seller a higher price than the buyer) and breach caused by high costs. Further, Rogerson considers the problem when a substitute market exists (and expectation damages are efficient) and when no substitute market exists. In the latter case, he allows postcontract negotiations over the level of reliance. His results without a substitute market and without postcontract negotiations parallel Shavell's. (See this paper's proposition 3.) With postcontract negotiations, Rogerson is able to rank the six damage measures he considers by the extent (and direction) reliance deviates from the optimum. Jeffrey Perloff, Breach of Contract and the Foreseeability Doctrine of Hadley v. Baxendale, 10 J. Legal Stud. 39 (1981), also discusses decisions to breach. In his model buyers vary the quality ordered and the probability of performance is beyond the control of the seller. Buyers are risk averse. Thus Perloff is primarily concerned with the insurance decision. A. Mitchell Polinsky, Risk Sharing through Breach of Contract Remedies, 12 J. Legal Stud. 427 (1983) examines the impact of three remedies for breach in the presence of risk-averse agents. In his model, parties must only allocate the risk; they can neither affect the probability of breach nor rely. Further, breaches occur because a third party values the good more highly than the initial buyer rather than because, as here, the delivered good has too low quality. Polinsky's propositions 1 and 2 parallel proposition 5 and the corollaries of the text infra.
One dimension along which the subject matter of contracts may differ is the ability of the promisee to rely on the promise of performance. Reliance is an investment that is profitable only in the event that performance occurs. Manufacturer/supplier relations provide many opportunities for reliance. The manufacturer, for instance, can plan his production on the basis of a schedule of deliveries. If he relied completely, he would let his inventories of supplies fall to zero by the date of delivery. On the other hand, a market in which cover is easy is one in which reliance decisions are likely to be rare or unimportant. Consumer goods markets probably provide little opportunity for promisees to rely.

In the analysis that follows, the legal rule of breach supplements a "market," whether the market has reputation or not. The legal rule might "matter" in two distinct senses. First, it might matter in a weak sense if different rules of law lead to different outcomes. Second, it might matter in a strong sense if it matters in a weak sense and if there exists some legal rule that induces people to behave optimally. As the standard of optimality, I use the Pareto-optimal complete contingent claims contract that the parties would draft in the absence of transaction costs. To ask, then, whether the rule of law matters in a strong sense is to ask to what extent the legal rule can substitute for the complete contingent claims contract. In Sections IV and V, I show, first, that the rule of law does not matter even in a weak sense in markets with risk-neutral buyers and sellers, reputation, and no reliance. That is, every rule leads to efficient behavior. Second, I show that the rule of law matters in a strong sense in risk-neutral, anonymous worlds without reliance and in risk-neutral worlds with reliance and reputation. Expectation damages are Pareto efficient in the former worlds and no damages are Pareto efficient in the latter. Third, I show that the rule of law weakly matters in anonymous worlds with reliance and in worlds with risk-averse actors.

The analysis proceeds as follows. In the next section, a simple example is presented to illustrate what a complete contingent claims contract is, how a damage rule completes an incomplete contract, and the definitions of reputation and reliance. Section III presents the model. Section IV presents the results. Section V makes some concluding remarks. An Appendix provides proofs for the assertions made in the text.

II. An Illustrative Example

An example will serve both to specify more precisely the problems examined and to introduce the model. Imagine a buyer who must purchase a gadget. Gadgets may be of normal quality or low quality. A normal quality gadget has a monetary value of $y_1$; a low quality gadget has
a monetary value of \( y_2 \).\(^3\) The quality of any particular gadget depends on the care the seller has taken in production and on some events outside the seller’s control.

In an ideal world without transaction costs, buyer and seller would enter a Pareto-efficient, complete contingent claims contract that specified (i) the care the seller should take (and, therefore, the probability \( p \) of delivery of a “normal” quality gadget); (ii) the price to be paid the seller in the event of the normal outcome \( y_1 \); and (iii) the price to the seller in the event of \( y_2 \). This contract would be Pareto efficient. If, however, the buyer cannot observe the seller’s effort or transaction costs prevent specifying a price for every contingency, the contract might only specify a price \( k \) to be paid for delivery of the normal value \( y_1 \). In this case, the law would provide for a “damage” payment from seller to buyer if \( y_2 \) occurs.

A damage rule \( \delta \) would be a perfect substitute for the complete contingent claims contract if, under \( \delta \), the seller chose the performance rate \( p \) that the complete contract specifies, and if the prices paid in outcome \( y_1 \) and \( y_2 \) matched the ideal contract prices. For this very simple situation, it is proven below that, in risk-neutral worlds with perfect reputation (that is, where buyers know the likelihood \( p \) that each seller will perform), every damage rule \( \delta \) substitutes perfectly for the complete contingent claims contract. In an anonymous risk-neutral world where buyers know only the distribution of performance rates in the market, only expectation damages \( \epsilon = y_1 - y_2 \), the rule actually enforced by the courts, substitutes for the complete contract.

The gadget example outlined above may be modified slightly to allow illustration of a second problem analyzed below. In some circumstances, the buyer might increase the monetary value of performance by making expenditures in reliance on the seller’s promise to deliver a normal quality good. For instance, a buyer might use the gadget in the manufacture of another good, and he might design the good and plan to produce it in a way that augments the value of a normal quality gadget. Assume the buyer chooses a level of reliance expenditure \( a \). Then if the seller delivers a normal quality gadget, the buyer receives a value of \( y_1(a) \), while if the seller delivers a low quality gadget, the buyer receives \( y_2(a) \). A reliance decision means, for all \( a \), \( y_1(a) > y_2(a) \) and \( y_1' > y_2' \). (If \( y_2' > y_1' \), the

\(^3\) The restriction to two outcomes is not crucial although several problems arise in extending the model to many outcomes. For instance, perfect reputation requires buyer knowledge not only of whether performance is satisfactory or unsatisfactory but of the probability that each specific quality level will be delivered. See Appendix B to Lewis A. Kornhauser, Breach of Contract in the Presence of Risk-Aversion, Reliance, and Reputation (Working Paper no. IP-284 Univ. Calif. Berkeley Inst. Bus. Econ. Res., February 1980), which develops the model for a continuum of outcomes.
decision is an insurance decision.) A complete contingent claims contract
would specify, in addition to the performance rate $p$ and the prices in each
outcome $y_1$ and $y_2$, a reliance level $a$. The discussion below establishes
that a rule of no damages ($\delta = 0$) substitutes for the complete contingent
claims contract in a risk-neutral world with reputation. In risk-neutral,
anonymous worlds, there does not exist any damage rule that induces
both the seller to choose the ideal performance rate $p^*$ and the buyer to
choose the ideal reliance level $a^*$. Expectation damage does, however,
produce a second-best result; it induces the seller to choose a perfor-
mane rate that is best given the level of reliance actually chosen by the
buyer.

A world with reputation differs from an anonymous world in what
buyers know about the reliability of sellers. In a world with (perfect)
reputation, buyers know how careful the seller with whom they are deal-
ing is. In anonymous worlds, buyers know only the distribution of care in
the market.

III. THE BASIC MODEL

Consider a market with many buyers, all of a single type, and many
sellers, possibly of many types. Buyers have von Neumann–Morgenstern
utility functions separable in money and reliance: $V(y, a) = v(y) - c(a)$
with $v' > 0, v'' < 0, c' > 0, c'' > 0$. If the buyer is risk neutral, $V(y, a) = y - c(a)$. Sellers of type $s$ have von Neumann–Morgenstern utility func-
tions separable in money and probability of performance $U^s(x, p) = u^s(x) - e^s(p)$, with $u' > 0, u'' < 0, e' > 0, e'' > 0$. The seller chooses $p$ by
choosing a production technology.

Ideally, buyer and seller would enter a complete, Pareto-efficient con-
tract. Each Pareto-efficient contract solves, for some $\bar{V}$, the following
constrained maximization problem: Maximize over $a, p, x_1, x_2$

$$EU(x_i, p) \text{ subject to } EV(y_i - x_i, a) \geq \bar{V}.$$ (1)

Let $(a^*, p^{**})$ be the reliance-performance rate pair that solves (1).

Transaction or information costs, however, prevent parties from writ-
ing complete contracts. The parties thus contract for delivery of a normal
quality good at a price $k$. The damage rule $\delta$ determines the seller’s pay-
ment to buyer in the event the delivered good is of low quality.\(^4\) Thus, the
buyer’s net receipts are $y_1(a) - c(a) - k$ in the event of performance

\(^4\) In the discussion of worlds with reliance, only damage rules that depend on actual
damages will be considered; thus the rules have the form $\delta[y_1(a) - y_2(a)]$. Throughout the
discussion, it is useful to keep this class of rules in mind because actual damages are
observable by the courts.
(normal quality delivered) and \( y_2(a) - c(a) - k + \delta \) in the event of breach (low quality delivered). The seller receives \( k \) in the event of performance, \( k - \delta \) in the event of nonperformance. The damage rule \( \delta = \epsilon = y_1(a) - y_2(a) \) is of particular significance. It fully insures buyers against loss and it is the prevailing rule of law.

The problem facing the judiciary differs from that facing the two parties in two ways. First, the court chooses the damage rule \( \delta \) subject to optimal responses on the part of buyers and sellers to the damage rule. Thus the contract price \( k \), the performance probability \( p \), and the level of reliance \( a \) will all depend on \( \delta \). Second, the legal rule selected will apply to a variety of buyer/seller pairs among which the Pareto-efficient contingent claims contracts may differ. A legal rule that substitutes perfectly for complete contracts may therefore have to depend on the individual characteristics of sellers and buyers. In fact, legal rules are rarely conditioned on litigants’ characteristics either because of institutional norms requiring impartiality or because courts do not have the appropriate information. While in the discussion of reliance below the court will be restricted to damage rules based on actual damages, it is convenient to phrase the judiciary’s problem more generally. The court seeks a rule \( \delta \), perhaps conditioned on seller characteristics, that, for every seller type \( s \), solves the problem:

\[
\max_{\delta} W(\delta) = EU^s(k, p; \delta) \text{ subject to } \begin{align*}
EV(y_1 - k, a; \delta) &= V \\
\frac{\partial EV}{\partial a} &= 0 \\
\frac{\partial EU^s}{\partial p} &= 0.
\end{align*}
\]  

Equation (2b) identifies a reliance level \( a \). Equation (2c) identifies for each seller type \( s \) a performance level \( p^s \). Each seller chooses a different performance rate \( p \) because he has a different cost of producing performance \( e^s(p) \). Both (2b) and (2c) assume that buyers meet sellers randomly.

5 More generally, (2b) should read \( \bar{a} \epsilon \arg \max EU(k, p) \). The restrictions on \( U \) and \( V \), however, imply that a unique solution exists for both buyer and seller, thus allowing the formulation in the text.

6 It is therefore possible that a “lemons” market would develop. See George Akerlof, The Market for Lemons: Qualitative Uncertainty and the Market Mechanism, 84 Q. J. Econ. 488 (1970). Of course, not every market with qualitative uncertainty leads to the complete market failure shown to be possible by Akerlof.

The random matching assumption restricts the analysis to one of two effects reputation might have on the seller’s choice of a performance rate. The buyer’s knowledge of the seller’s reputation may affect the price the seller will receive.\(^8\) This potential effect remains under the assumed “search” rule. The assumption excludes the possibility that the seller’s reputation will affect his market share and, in the presence of economies of scale or disequilibrium, his profits. In the reputation case, the further restriction that buyers have perfect knowledge of the seller’s performance rate allows sellers to solve (2c) and buyers to solve equation (2b).

In an anonymous world, buyers do not know the precise characteristics of the seller with whom they deal. They do know the distribution of seller characteristics in the seller population. This knowledge and the random matching assumption allow each buyer to calculate for any price/damage rule pair \((k_0, \delta)\) the derived distribution of performance rates \(\Pi(p, k_0, \delta)\) in the seller population. Equations (2b) and (2c) are therefore solvable in the anonymous case.

Equation (2a) implicitly determined the price formation mechanism in the market.\(^9\) Consider, for example, a world without reliance and with reputation. If sellers have reputation, the price \(k = k(p, \delta)\) depends on both the rule of law and the known characteristics of the seller. According to (2a), \(k\) is determined by

\[
\overline{V} = pv(y_1 - k) + (1 - p)v(y_2 - k + \delta) .
\]

For a risk-neutral buyer, we have

\[
k = py_1 + (1 - p)(y_2 + \delta) - \overline{V} .\]

April 1978), investigate the effects of damage rules on a party’s search activity. They show that expectation damages do not fully account for external effects from search.

\(^8\) For an informal discussion of the effect of relaxing these assumptions, see Kornhauser, supra note 3.

\(^9\) \(\overline{V}\) is determined outside this model. It depends on market structure and demand conditions. Suppose, for example, that the seller industry has a fixed capacity. If demand at a price equal to marginal cost exceeds capacity, the price \(k\) clears the market and sellers earn positive profits. \(\overline{V}\) would be the buyer’s reservation utility. A similar analysis allows the buyer to derive the distribution \(\Pi(p; k_0, \delta, a)\) in a world with reliance.

\(^{10}\) In an anonymous world, buyers know, for any price/damage rule pair \((k_0, \delta)\), the induced distribution \(\Pi(p; k_0, \delta)\). Equation (2a) thus determines price by

\[
\bar{V} = \int \Pi(p; k_0, \delta)(pv(y_1 - k_0) + (1 - p)v(y_2 + \delta - k_0))dp ,
\]

where \(q = \mathbb{E}\Pi(p; k_0, \delta)\) is the mean performance rate in the market. Equation (i) defines the price \(k_0\) as a function of the damage rule \(\delta\), or \(k_0 = k_0(\delta)\), because as \(k\) increases the performance rate of every seller is nonincreasing. Consequently \(q\) is nonincreasing and \(k\) is uniquely determined by (i). For worlds with reliance, prices are formed analogously. If sellers have perfect reputations, equation (2a) indicates that the price \(k = k(p, a, \delta)\) is determined by

\[
\bar{V} = pv[y_1(a) - \bar{k}] + (1 - p)v[y_2(a) - \bar{k} + \delta] - c(a) .
\]
Equation (2a), therefore, defines the price as a function \( k(p, \delta) \) of \( p \) and \( \delta \) in worlds with reputation and as a function \( k_0 \) of \( \delta \) and the distribution of seller characteristics in anonymous worlds. In markets with reputation, \( p \) and \( \delta \) determine precisely the commodity being sold; it is defined by the physical characteristics and the extent of assurance that delivery will actually occur. Raising \( p \) and raising \( \delta \) increase the probability of delivery (of value); hence the price should rise as \( p \) rises or as \( \delta \) rises to compensate the seller for the increased costs. In anonymous worlds, the analysis is more complex. As \( \delta \) rises, buyers are better off as long as the distribution of performance rates \( \pi(p; k, \delta) \) remains the same. If the distribution changes unfavorably by, for example, a decrease in the mean performance rate \( q \), then the buyers may suffer. As sellers maximize their own welfare, a rise in price will induce them to reduce their performance rate. Some simple analysis\(^{11} \) allows us to conclude that \( k_0' (\delta) \geq 0 \) for \( \delta \leq \varepsilon \) and buyers completely and buyers' knowledge of \( p \) has no effect on price.

\(^{11} \) Against the price schedule determined by (3), a seller \( s \) chooses a performance rate \( p_s \) to satisfy

\[
\frac{\partial p^s}{\partial k} = \frac{u^s(k_0) - u^s(k_0 - \delta)}{|e'(p)|} < 0.
\]

In an anonymous world, the mean performance rate \( q \) substitutes for \( p \) in (3):

\[
V = qv(y_1 - k_0) + (1 - q)v(y_2 + \delta - k_0).
\]

Since (i) still determines the response of every seller type \( s \) to a price \( k_0 \), the mean performance rate will decline: \((\partial q/\delta k) < 0 \). Similarly, we may differentiate (i) with respect to \( p \) and \( \delta \) to yield

\[
\frac{\partial p_0^s}{\partial \delta} = u^s(k_0 - \delta)/e'(p) > 0,
\]

so \((\partial q/\delta \delta) > 0 \). \( k_0' (\delta) \) may be derived by differentiating (i) in note 10 with respect to \( k \) and \( \delta \). This yields

\[
k_0' (\delta) = \frac{\partial q}{\partial \delta} \left[ v(y_1 - k_0) - v(y_2 + \delta - k_0) \right] + (1 - q)v'(y_2 + \delta - k_0) \geq 0, \quad \text{(ii)}
\]

at least for \( \delta \leq \varepsilon \).
IV. Results

Some propositions about the effects of damage rules may now easily be derived. Proofs for the propositions appear in an Appendix.

A. Damage Rules in the Absence of Reliance and of Risk Aversion

Consider first the situation in which buyers have no reliance decision to make and both buyers and sellers are risk neutral. In the absence of a complete contingent claims contract the seller might take too little care in production because the seller does not necessarily see the cost his inadequate performance imposes on the buyer while the costs of taking care fall directly on the seller. The legal rule of damages is one device for "showing" the seller the costs of inadequate performance; damages are a measure of those costs. Reputation, however, is another institution that reveals to the seller the cost of inadequate performance because the price he receives for his good depends on his reputation for normal performance. Proposition 1 establishes that reputation is a perfect substitute for the damage rule; regardless of what rule of law prevails, sellers will behave optimally in worlds with reputation and without reliance or risk aversion.

PROPOSITION 1: Suppose buyers and sellers are risk neutral, sellers have reputations, and there is no reliance decision. Then, for every damage rule \( \delta \), each seller \( s \) chooses \( p^*, \) the performance rate of a perfect contingent claims contract.

Proposition 1 establishes that in simple worlds with reputations, the rule of law does not matter. Optimality is achieved regardless of the rule of law. Proposition 2 establishes that the rule of law matters strongly in simple anonymous worlds.

In anonymous worlds some sellers will choose performance rates different from \( q \), the mean performance rate, on which the price depends. Consequently, not every damage measure will substitute for a complete contingent claims contract.\(^{12}\) We know, however, that at expectation damages \( k(p, \epsilon) = k_0(\epsilon) \) and that \( \epsilon \) induces optimal performance in the world with reputation. This establishes

PROPOSITION 2: In an anonymous world without reliance and with risk-neutral buyers and sellers, only the rule \( \delta = \epsilon = y_1 - y_2 \) induces for every type \( s \) the choice \( p^{**} \).

B. Damage Rules in Worlds with Reliance and Risk Neutrality

Consider now the situation with reliance in worlds with reputation. The damage rules to be examined depend on actual damages; we shall con-
sider the class of rules $\Delta = \{ \delta [y_1(a) - y_2(a)] : \delta \geq 0 \}$. Intuitively, any 
damage rule $\delta > 0$ induces the buyer to rely more than the optimal 
amount, for the buyer does not see the additional damage costs he im-
poses on the seller. On the other hand, proposition 1 suggests that all $\delta$ in 
$\Delta$ create appropriate incentives for sellers. As a consequence we would 
expect

PROPOSITION 3: In a world with reputation and risk-neutral buyers and 
sellers, (i) $\delta = 0$ induces the buyer to choose $a^*$ and every seller type $s$ to 
choose $p^{s*}$ where $(a^*, p^{s*})$ are the Pareto-optimal choices of a complete 
contingent contract and (ii) every other $\delta > 0$ induces for every $s$, the 
optimal $p^s$ given $a$.$^{13}$

In anonymous worlds the law can only effect second-best outcomes in 
which reliance is generally improperly chosen. This may easily be seen 
because the buyer chooses his reliance $a$ against the expected perfor-
mance rate $q$ of sellers. There are two cases. For any damage rule less 
than expectation damages, the reliance level $a$ will be chosen nonopti-
mally when $p \neq q$. At $\delta = \epsilon$, the anonymous world is equivalent to the 
world with reputation, because the buyer, being completely insured, does 
not price discriminate on the basis of reputation. Hence, the results of 
proposition 3(ii) apply: the buyer relies improperly. The improper choice 
of $a$, of course, means that sellers do not choose $p^s$ at the first-best levels. 
They do, however, choose $p^s$ optimally given the buyer’s choice of re-
liance. The legal rule thus affects behavior quite dramatically.

In anonymous worlds, damage rules will, in general, be second best in a 
further way. The courts, like the buyers, are constrained to choose $\delta$ 
independent of seller characteristics. If courts could determine seller type 
$s$, they would condition $\delta$ on $s$. These conclusions may be summarized as

PROPOSITION 4: Let buyers and sellers be risk neutral in an anonymous 
world.

Then (i) $a$ is not chosen optimally given $p^s$; (ii) $p^s$ is optimal given the 
buyer’s (possibly nonoptimal) choice of $a$; and (iii) the second-best judi-
crul rule is conditional on seller type $s$, that is,

$$
\delta = \frac{1 - \gamma}{\gamma} \frac{k'(\delta)}{b(y_1 - y_2)} + \frac{1 - q}{b} - \frac{1 - p^s}{\gamma b} + 1
$$

$$
- \frac{\partial a}{\partial \delta} \frac{(1 - p^s)\delta [y_1'(a) - y_2'(a)]}{\gamma b}
$$

where $b = (\partial q/\partial \delta) + (\partial q/\partial a) (\partial a/\partial \delta)$ and $\gamma$ is the social weight accorded 
the buyer class by the courts.

$^{13}$ Statement (ii) parallels Shavell’s proposition 2 in Shavell, supra note 2, for $\delta = \epsilon$. 
C. Damage Rules in Worlds with Risk Aversion

Thus far only risk-neutral worlds have been considered, but the intuition behind the preceding results allows insight into the risk-averse case in which the general optimality results of propositions 1-3 do not hold. Consider the anonymous world. The damage rule $\delta$ plays two roles. It (partially) insures the buyer against nonperformance by the seller while it reveals to the seller some of the costs his failure to perform imposes on the buyer. In worlds with reputation, the price $k(p, \delta)$ substitutes, in both roles, perfectly for the damage rule. All the above results rest on the ability of the rule $\delta$, in combination with a price system, adequately to reflect the buyer's costs in the seller's decision problem. In the presence of risk aversion, a damage measure must reflect not only the actual loss imposed by nonperformance but also the risk costs that the buyer faces from nonperformance and that the seller faces from nonperformance. Given the price formation rule embedded in constraint (2a), one can see that if sellers are risk neutral, the rule $\delta = \epsilon$ will, in a world without reliance, induce the choices obtained under an optimal contingent claims contract. Similarly, in a world with reputation and risk-neutral buyers, the rule $\delta = 0$ induces the optimal results. In each case, the risk-neutral party carries all the risk while the damage rule in the former case and the price system in the latter convey the appropriate incentives to the seller. When both parties are risk averse, the risk-sharing and incentive-communicating functions cannot both be achieved by a rule not conditioned on the characteristics of the buyer and seller. These results are formally stated and proved in the next proposition and the succeeding two corollaries.

**Proposition 5:** Suppose buyers and sellers act in a world without reliance and with reputation. Then (i) if buyers are risk averse and sellers risk neutral, rule $\delta = \epsilon$ is optimal; (ii) if buyers are risk neutral and sellers risk averse, rule $\delta = 0$ is optimal; and (iii) if buyers and sellers are risk averse, then the optimal rule is conditioned on the characteristics of the buyer and seller.

**Corollary 5.1:** If there is no reliance and anonymity, then (i) if buyers are risk averse and sellers are risk neutral, $\delta = \epsilon$ is optimal; and (ii) in all other cases, the second-best rule depends on the characteristics of buyers and sellers.

**Corollary 5.2:** If there is reliance, then (i) if buyers are risk neutral, sellers are risk averse, and sellers have reputation, $\delta = 0$ induces the optimal choices of $a$ and $p$; (ii) in all other cases in which there is reputation, the optimal outcomes may be induced by a rule conditioned on buyer and seller types; and (iii) if the world is anonymous and at least one party
is risk averse, then the second-best rule depends on agent characteristics.\footnote{Polinsky’s model is parallel to the world with reputation and without reliance considered in the proposition and corollary. See his propositions 1 and 2, supra note 2.}

V. Concluding Remarks

The model presented above highlights two aspects of the legal system that legal-economic analyses have so far ignored. First, the law is only one of many social institutions and practices amid which markets function. As seen in proposition 3, the interaction of the legal system and the social institution of reputation allows markets to achieve, in risk-neutral worlds, both optimal reliance and optimal performance rates. In the absence of reputation, no legal rule performs as well. The law and reputation do not exhaust the institutional setting in which economic agents transact. For instance, this model, like most others of contract law, uses a partial equilibrium approach. Parties may be able to mitigate some of the adverse effects of potential breach by contracting in other markets. The inclusion of insurance markets would be of particular interest, since the presence of risk aversion significantly reduces the ability of damage rules to substitute for complete contingent claims contracts.\footnote{Other legal rules might interact with damage rules to yield more efficient outcomes. Grossman presents a model of warranty that is superficially akin to the model of reputation presented here. Sanford Grossman, The Informational Role of Warranties and Private Disclosure about Product Quality, 24 J. Law & Econ. 461 (1981). In Grossman’s model, the warranty is quality revealing, so it has the same function as reputation: Grossman’s model differs from the one presented here in a variety of ways, most significantly in that the offer of a warranty \( w \) in Grossman’s model amounts to the offer of a complete contingent claims contract. In the reputation model, no contract is complete.}

Second, the model indicates that, in many instances, the ideal legal rule would be contingent on characteristics of the parties that the court cannot discover or of which moral, legal, or political considerations preclude use. Future investigations might profitably turn to examination of the economic consequences of judicial choice of rules in the presence of these constraints.

An analogous problem, not broached in the prior discussion, arises from the fact of settlement. Most disputes are settled out of court but in the shadow of the governing legal rules. The incentives to rely and to perform are thus mediated through the pattern of settlements induced by a particular rule of law. The “optimal” damage rules discussed above are probably below the “true” optimal levels which must account for settlements.

Finally, the analysis bears on several disputes in the contract literature.
First, and most obviously, it explains in part the discrepancy between Macaulay's findings that businessmen pay little attention to contract law as a remedial device and Shavell's analysis of breach rules. In the model presented, reputation will substitute perfectly for a damage rule. When agents are risk neutral and there is no reliance, reputation allows the achievement of optimality regardless of the legal rule. In worlds less favorable for the achievement of optimality, reputation should still substitute at least partially for legal rules. Second, and related to the first point, the analysis suggests that courts should differentiate damage rules on the basis of the market. It is common for the courts to differentiate some procedural rules by market. For instance, in the law of sales different statute-of-frauds rules govern contracts between merchants from those governing other contracts. Proposition 2 suggests that in markets with reliance, risk neutrality, and reputation a rule of no damages would be best. Third, the analysis bears on the debate over the use of reliance damages instead of expectation damages. It suggests, in conformity with prior results, that, at least in the presence of risk-neutral agents and little reliance, expectation damages are superior. Fourth, the analysis supports indirectly arguments for easing restrictions on liquidated damages clauses. After all, propositions 4 and 5 (and the latter's corollaries) indicate that the first-best rule of law in the presence of risk aversion or of risk neutrality, anonymity, and reliance depends on the individual characteristics of the buyers and sellers. The parties to the contract are best able to discover these characteristics, and there is no reason to prevent them from contracting around the damage rule. The relevance of the model to the liquidated damages problem should not, however, be overdrawn. The optimal clauses suggested by propositions 4 and 5 will all be less than expectation damages; it is not clear that they would be construed as penalties by a court. Further, within the context of the model, adding a liquidated damages clause would create a complete contingent claims contract. In more realistic situations, the parties would choose some "average" liquidated damage amount that would apply over a number of contingencies. The appropriate welfare comparison is between the damage rule selected by the parties for all "uncontracted for" events and the court rule.

16 Uniform Commercial Code § 2-201.
17 See Shavell, supra note 2.
APPENDIX

PROOF OF PROPOSITION 1: Solve the maximization problem (2) with

\[ EU(k, p; \delta) = k - (1 - p)\delta - e(p) \]  
(A1)

and

\[ EV(y; \delta) = py_1 + (1 - p)(y_2 + \delta) - k = \bar{V}. \]  
(A2)

Solving (A2), which is (2a) for a risk-neutral buyer, for \(k\) and substituting into (A1) yields the expression \(W(\delta) = py_1 + (1 - p)y_2 - e(p) + \bar{V}\), which is independent of the damage measure \(\delta\). Further, by (2c), the expression \(y_1 - y_2 = e'(p)\) defines \(p\) as the performance rate that maximizes \(py_1 + (1 - p)y_2 - e(p)\).

Q.E.D.

PROOF OF PROPOSITION 3: The solution to the maximization problem (1) requires

\[ y_1(a) = y_2(a) - e'(p) = 0 \]  
(A2a)

\[ py_1'(a) = (1 - p)y_2'(a) - c'(a) = 0 \]  
(A2b)

\[ x_1 = \frac{1 - p}{p} x_2 + y_1(a) + \frac{(1 - p)}{p} [c(a) + \bar{V}] = \frac{1}{p}. \]  
(A2c)

From constraint (2a) of the maximization problem facing the court, one notes that (A2c) is fulfilled by setting \(k = x_1\) and \(k - \delta = x_2\). Constraint (2b) requires \(py_1'(a) = (1 - p)(y_2'(a) + \delta[y_1'(a) - y_2'(a)]) - c'(a) = 0\). Therefore \(\delta = 0\) induces the buyer to choose \(a^*\), the complete contingent contract reliance level. It remains to show that \(p^s = p^*\) for \(\delta = 0\). Consider constraint (2c):

\[ \frac{dk}{dp} + \delta[y_1(a) - y_2(a)] - (1 - p)\delta[y_1'(a) - y_2'(a)] \frac{\partial a}{\partial p} = e'(p). \]  
(A3)

Recall that \(k(p, \delta) = \bar{k}[p, \delta, a^*(p, \delta)]\) is a function of \(p, \delta,\) and \(a\) with \(a\) chosen optimally \((\partial k/\partial a = 0)\). Thus, by differentiating (ii) in note 10, implicitly we have

\[ \frac{dk}{dp} = (\partial k/\partial p) + (\partial k/\partial a)(\partial a^*/\partial p) + (\partial k/\partial \delta)(\partial \Delta/\partial a)(\partial a/\partial p). \]

Substituting into (A3) yields, for constraint (2c), \(y_1(a) - y_2(a) = e'(p)\). Thus, as stated in 3(ii), \(p\) will be chosen optimally given the choice of \(a\). At \(\delta = 0, a = a^*\), which implies \(p = p^*\) and the damage rule induces the Pareto-optimal choices.

Q.E.D.

PROOF OF PROPOSITION 4: We find that (i) follows immediately from considering constraint (2b) in an anonymous world. Buyers choose \(a\) to satisfy \(qy_1'(a) + (1 - q)(1 - \delta)y_2'(a) + \delta y_1'(a)] + (\partial q/\partial a)[y_1(a) - y_2(a)](1 - \delta) = c'(a)\), while if \(p^*\) were known \(a\) would satisfy \(p^*y_1'(a) + (1 - p^*)(1 - \delta)y_2'(a) + \delta y_1'(a)] = c'(a)\). Even at \(p^* = q, a\) is chosen nonoptimally because the buyer chooses \(a\) to influence the distribution \(\Pi(p; k_0, \delta, a)\). Then (ii) follows immediately from constraint (2c); and (iii) follows from consideration of the derivative with respect to \(\delta\) of

\[ W(\delta) = EU(k, p) + \gamma EV(y - k, a), \]  
(A4)
with $p$ and $a$ optimally chosen. Differentiating yields

$$W'(\delta) = k_0'\delta + (\delta EU/\delta p)(\delta p/\delta \delta) - (d\alpha/d\delta)(1 - p')\delta[y_1' - y_2'] + \gamma(1 - q)(y_1 - y_2) - k_0' + (\delta EV/\delta a)(d\alpha/d\delta) + [(\delta q/\delta \alpha) + (\delta q/\delta \alpha)(d\alpha/d\delta)](1 - \delta)(y_1 - y_2) = 0.$$  

Solving for $\delta$, and noting $(\delta EU/\delta p) = (\delta EV/\delta a) = 0$, yields (A1)\textsuperscript{19}. Note that (A4) subject to (2b) and (2c) restates the maximization problem (2). Q.E.D.

**Proof of Proposition 5:** Consider the first-order conditions of the maximization problem (1):

$$u'(x_1) = yv'(y_1 - x_1) \quad \text{(A5a)}$$
$$u'(x_2) = yv'(y_2 - x_2) \quad \text{(A5b)}$$
$$u(x_1) - u(x_2) + \gamma[v(y_1 - x_1) - v(y_2 - x_2)] = e'(p) \quad \text{(A5c)}$$
$$pv(y_1 - x_1) + (1 - p)v(y_2 - x_2) = \bar{v}. \quad \text{(A5d)}$$

Let $p^*$ solve these four equations.

In each of the three cases in the proposition, we seek a $\delta$ that induces the seller to choose $p^*$ and to show that the corresponding pair $(k, \delta)$ satisfies (A5a) and (A5b). Thus we must have

$$u'(k) = yv'(y_1 - k) \quad \text{(A6a)}$$
$$u'(k - \delta) = yv'(y_2 - k + \delta) \quad \text{(A6b)}$$
$$u(k) - u(k - \delta) + \frac{\partial k}{\partial p} [pu'(k) + (1 - p)u'(k - \delta)] = e'(p). \quad \text{(A6c)}$$

Recall that

$$\frac{\partial k}{\partial p} = \frac{v(y_1 - k) - v(y_2 - k + \delta)}{pv(y_1 - k) + (1 - p)v(y_2 - k + \delta)}. \quad \text{(A7)}$$

If the seller is risk neutral, (A6c) reduces to

$$\delta + \frac{\partial k}{\partial p} = e'(p). \quad \text{(A8)}$$

But, at $\delta = \epsilon$, $\partial k/\partial p = 0$, (A8) is equivalent to (A5c), and $(k, k - \delta)$ satisfies (A5a) and (A5b). This proves (i).

Similarly, if the buyer is risk neutral and $\delta = 0$, $\partial k/\partial p = y_1 - y_2$, $y = u'(k)$, and as (A6c) reduces to (A5c) the seller chooses $p = p^*$. Since (A5a) and (A5b) are satisfied, (ii) is proved.

\textsuperscript{19} I have not thoroughly analyzed the complications that arise from conditioning on seller characteristics $s$. Consider the decisions faced by both buyer and seller when the known rule is $\delta(s)$ but buyers do not know seller characteristics $s$. The seller will choose $p$ optimally against $\delta(s)$ as the seller knows his own type (and as the courts make no errors in determining the seller type before them). The distribution of performance rates, therefore, depends on $\delta(s)$ and $k_0$. Now, however, the buyer must be choosing $k_0$ based on the average $\delta$ he will encounter because he knows his damages vary with the seller type he confronts. The buyer also chooses his reliance against the average damage measure; this explains why the damage rule is second best. The optimal reliance depends on the seller with whom the buyer contracts.
Finally, consider (iii). For any given vector of buyer and seller characteristics \((b, s)\) we may identify a \((b, s)\) that induces the appropriate choice of \(p\) as long as the buyer assumes that \((b, s)\) applies against all seller types. We may see this by substituting \((A7)\) into the left-hand side of \((A6c)\) and noting that if
\[
\frac{u'(k)}{v'(y_1 - k)} = \frac{u'(x_1)}{v'(y_1 - x_1)} = \frac{u'(k - \delta)}{v'(y_2 - k + \delta)} = \gamma,
\]
then
\[
\frac{pu'(k) + (1 - p)u'(k - \delta)}{pv'(y_1 - k) + (1 - p)v'(y_2 - k + \delta)} = \gamma
\]
and \((A6c)\) is equivalent to \((A5c)\). We can choose \(k\) and \(\delta\) to satisfy \((A6a)\) and \((A6b)\):
\[
k(p^*, \delta) = x_1 \text{ and } \delta = x_1 - x_2.\]
Doing so is consistent with the price formation rule \((2a)\) as, at \(k(p^*, x_1 - x_2) = x_1\), the buyer is guaranteed, by \((A5d)\), a utility \(\bar{V}^0.\)
Q.E.D.

Proof of Corollary 5.1: (i) From the proposition, we know that \(\delta = \epsilon\) induces optimal choice of \(p^*\) in a world with reputation. At \(\delta = \epsilon\) buyers are completely insured so knowledge of seller reputation is worthless. Thus \(\delta = \epsilon\) will be optimal in the anonymous world. (ii) Consider the proof of part (iii) of the proposition. There we chose \(k(p^*, \delta) = x_1 \text{ and } \delta = x_1 - x_2\). Here, however, the buyer chooses a uniform \(k\) while \(x_1\) will vary with seller characteristics. Therefore, we will not be able to induce the first-best outcomes, in particular the optimal risk-sharing arrangement for every seller type. A second-best solution can be obtained by methods parallel to those used in the proof of proposition 4. Q.E.D.

Proof of Corollary 5.2: (i) From part (ii) of the proposition, we know that \(\delta = 0\) induces optimal performance. But, from proposition 3 where the buyer is also risk neutral, \(\delta = 0\) will also induce optimal reliance. (ii) Consider the proof of part (iii) of the proposition. It states we can induce appropriate performance in the absence of reliance. To induce optimal reliance, one conditions the amount of damages not on actual reliance but on optimal reliance on the part of the buyer. As he no longer benefits from overreliance, the buyer will choose \(a\) optimally. (iii) In anonymous worlds the parties optimize against the distribution of buyers and sellers they see. The court cannot by ex post determination of which party is which induce optimal reliance or performance from parties who decide in ignorance. See the proof of part (ii) to corollary 5.1. Q.E.D.

20 The problem is a bit more complex than the proof suggests. \(p^*\) and \(x_1\) vary with seller characteristics. Hence the buyer must be assumed to produce a price schedule for each seller type and the seller maximizes against the schedule appropriate for him. In effect, the buyer and seller write a complete contingent claims contract.