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COMMITMENT AS A SOLUTION  
TO THE HOLDUP PROBLEM

Yuval Procaccia

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Harvard Law School  
Cambridge, MA 02138

Contributors to this series are John M. Olin Fellows or Terence M. Considine Fellows in Law and Economics at Harvard University.

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# THE PRECONTRACTUAL COMMITMENT AS A SOLUTION TO THE HOLDUP PROBLEM

Yuval Procaccia\*

## *Abstract*

*In the course of negotiations, parties often communicate their bargaining positions by extending commitments. Legal scholars and courts have long struggled with the question of whether such commitments ought to be legally binding although a formal contract had not yet been formed. On the one hand, denial of legal enforcement is arguably desirable, as it allows parties to pursue their negotiations freely, without fear of liability prior to ascertaining the potential for a mutually beneficial deal. Such liability is argued to create a "chilling effect" that would undesirably deter parties from entering into negotiations in the first place. On the other hand, however, denial of precontractual enforcement gives rise to the classic holdup problem when parties engage in precontractual reliance. By eroding parties' incentives to rely, denial of enforcement diminishes the magnitude of the joint expected surplus.*

*Although the adverse impact of the holdup problem is often significant and the volume of related case law is large, the existing law of precontractual commitments is highly indeterminate and substantially lacking in clarity and consistency. The purpose of this paper is to provide a systematic analysis of the merits of such enforcement. It explains how enforceable precontractual commitments could be designed to solve the holdup problem, while generating optimal reliance and trade. Furthermore, it demonstrates that enforcement of such commitments need not limit parties' ability to remain free from unwanted liability; thus, applying a penalty for breach does not, in and of itself, undermine the incentive to negotiate.*

*Parties' incentives with respect to trade and reliance are a function of the measure of damages applied in cases of breach. It is shown that both measures of expectation damages and reliance damages generate optimal decisions to trade and invest. This result is partially consistent with existing doctrine, under which commitments are enforced by one of these two types of remedies. However, it is also observed that for the optimal results to obtain, parties must be able to foresee which of these measures will be applied prior to the extension of the commitment. Hence, an additional implication of the analysis is that the default rule of enforcement ought to be made more foreseeable, and that the current degree of ex post judicial discretion is overly broad.*

\* S.J.D. Candidate, Harvard Law School. I wish to thank the John M. Olin Center for Law, Economics and Business at Harvard Law School for its generous research support.

## **I. Introduction**

In the course of contractual negotiations, parties often engage in precontractual reliance, costly actions that yield a benefit if agreement is eventually reached, but are wasteful otherwise. Reliance is thus a form of investment made in the course of negotiations. It becomes wholly or partially sunk by the time negotiations are concluded, and generates a return only if a contract is ultimately formed.

Opportunities for reliance may arise in almost any conceivable type of precontractual relationship. For example, an employee seeking promotion might choose to undergo training that is specific to the desired position. While investing in training would increase her chance of being offered the promotion, it might not yield a desirable benefit if her candidacy is eventually rejected. Likewise, in the business arena, parties negotiating a merger might invest considerably in studying each other's performance, or in the meantime forego alternative business opportunities. Such investments bear fruit if negotiations succeed, but clearly generate no value if they fail. Or in the international trade arena, a country might benefit from lifting its customs if its trading partners follow suit, but sustain a loss if eventually they fail to do so. Similar examples are, of course, abundant.

Although the direct beneficiary of a reliance investment is typically the relying party herself, reliance generally yields an indirect benefit to her negotiating counterpart as well, in the form of a shift in the parties' respective bargaining positions. As reliance increases the relying party's gains from consummated trade, it also increases the opportunity costs she incurs if negotiations fail. Hence, a party's zeal to conclude an agreement once she engages in reliance makes her vulnerable: the more she values the agreement, the better positioned her counterpart becomes to voice bolder demands. That shift in bargaining power allows the counterpart to effect a "holdup," that is, to extract in bargaining some of the investment's return. Accordingly, the relying party, wishing to minimize her exposure to holdup, tends to invest less in reliance than she otherwise would. Ultimately, the problem of holdup thus leads to a diluted incentive to

rely. From a social perspective, the level of investment becomes sub-optimal, and consequently some potential surplus is “left on the table.”<sup>1</sup>

As suggested by the considerable volume of case law, reliance prior to the moment of contracting may often produce substantial value.<sup>2</sup> In a typical case, a matter will be brought to trial after a party broke a commitment which had induced her counterparty to rely. The primary legal question arising in this line of cases is whether such a commitment is enforceable given its extra-contractual character, and if so, what is the measure of damages to which the disappointed promisee should be entitled.

Precontractual commitments are distinct from standard contractual obligations not only in the timing in which they are extended, but also in their substantive content. Most notably, the precontractual commitment is often unilateral, in the sense that it is not reciprocated by a corresponding obligation by the promisee. Moreover, it is designed to support the process of negotiations itself, rather than to regulate the activity that is the subject of the contemplated contract. This paper examines the role such commitments play in relation to the holdup problem. In particular, its aim is to establish that an enforceable commitment of the form described above can resolve the problem in a first-best sense. It is shown that under broad conditions, the non-relying party carries an incentive to grant such a commitment prior to the reliance investment, and that the commitment, in turn, induces its recipient to choose the socially optimal level of reliance.<sup>3</sup>

Of course, commitments are sometimes broken, and hence an important question to ask is what means ought to be taken to enforce them. It is found that enforcement with either the

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<sup>1</sup> The pioneering work on the holdup problem is due to OLIVER E. WILLIAMSON, *MARKETS AND HIERARCHIES: ANALYSIS AND ANTI-TRUST IMPLICATIONS* (1975); Oliver E. Williamson, “*Transaction Cost Economics: The Governance of Contractual Relations*,” 22 *J. L. & Econ.* 233 (1979); Benjamin Klein, Robert Crawford & Armen Alchian, “*Vertical Integration, Appropriable Rents, and the Competitive Contracting Process*,” 21 *J. Law. Econ.* 297 (1978).

<sup>2</sup> For a review, See E. Allan Farnsworth, “*Precontractual Liability and Preliminary Agreements: Fair Dealing and Failed Negotiations*,” 87 *Colum. L. Rev.* 217, 221 (1987); Alan Schwartz & Robert Scott, “*Precontractual Liability and Preliminary Agreements*,” 120 *Harv. L. Rev.* 661 (2007).

<sup>3</sup> To be sure, the promise also comes at a cost to the grantor, as it limits her freedom to pull back from negotiations without penalty. However, the analysis, as explained in more elaborate detail in sections III and IV, suggests that this cost is outweighed by the grantor’s additional gain generated by optimal reliance.

expectation or the reliance measures will sustain the optimal results. The reliance measure may be advantageous if information regarding reliance is more readily accessible to courts than information about expectation. The expectation measure, however, may be preferable to reliance as it may generate renegotiations less frequently, and thereby economize on transaction costs.

An examination of the existing laws governing precontractual commitments suggests that in actual fact the measures of reliance and expectation are indeed applied on a regular basis.<sup>4</sup> The choice between them, however, is determined in a rather ad-hoc fashion, and is therefore difficult to plan upon. As noted by E. Allan Farnsworth, "[i]t would be difficult to find a less predictable area of contract law."<sup>5</sup> As the analysis makes clear, the parties will adjust their behavior differently, depending on the measure they believe would be applied. Hence, one prescriptive thrust of this paper is that the law of negotiation ought to convey a clearer choice between the two remedial options.<sup>6</sup>

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<sup>4</sup> The measure of expectation is generally applied when the commitment is viewed as an "offer", which paves the way for the creation of a full contract at the recipient's discretion. See note 6, *infra*.

<sup>5</sup> Farnsworth, *supra* note 2 at 259-260. See also Schwartz and Scott, *supra* note 2; and Richard Craswell, *Offer, Acceptance and Efficient Reliance*, 48 Stan. L. Rev. 481 (1996). For discussions of the holdup problem in legal literature, see also G. Richard Shell, *Opportunism and Trust in the Negotiation of Commercial Contracts: Toward a New Cause of Action*, 44 Vand L. Rev. 221 (1991); Wouter P.J. Wils, *Who Should Bear the Costs of Failed Negotiations? A Functional Inquiry into Precontractual Liability*, 4 Journal des Economistes et des Etudes Humaines 93 (1993); Juliet P. Kostritsky, *Bargaining with Uncertainty, Moral Hazard, and Sunk Costs: A Default Rule for Precontractual Negotiations*, 44 Hastings L.J. 621 (1993); Timothy J. Muris, *Opportunistic Behavior and the Law of Contracts*, 65 Min. L. Rev. 521 (1981).

<sup>6</sup> Two major reasons account for the doctrine's lack of predictability. First, a given precontractual promise may often fall within the scope of various overlapping doctrines, where each produces a potentially different legal outcome. Thus, for example, a promise that induces reliance might invoke the doctrine of "promissory estoppel", but might also be construed as an option contract. Further, if it is sufficiently definite, it might be viewed as an offer, which – if accepted – creates a basis for full contractual obligation. In turn, the legal consequences of revocation of such promises very much depend upon the doctrine that is ultimately applied.

The second reason is that even if the applied doctrinal structure is correctly predicted, some of the doctrines themselves are highly indeterminate. Hence, for instance, under section 87 of the Restatement Second of Contracts, which addresses the enforceability of option contracts, the remedy measure is not generally defined. To illustrate, consider comment e to this section: "Various factors may influence the remedy: the formality of the offer, its commercial or social context, the extent to which the offeree's reliance was understood to be at her own risk, the relative competence and the bargaining position of the parties, the degree of fault on the part of the offeror, the ease

The information a court will need to generate the desired results is quite modest. In contrast to some existing solutions to the holdup problem, the proposed mechanism does not depend on the verifiability of the parties' relative bargaining power, the particular shape of the investment function, the level of reliance actually chosen, or the parties' reservation values. All the court needs to verify is the terms of the commitment as offered by the grantor and, depending on the applicable remedy, the sum reflecting the recipient's expectation or reliance interest. These factual determinations are made by courts on a regular basis, and hence should not pose a particularly heavy burden.

The remainder of the paper is organized as follows. Section II locates the present analysis within the broader related literature; section III provides an intuitive account of the main results using a simple numerical example; section IV then derives the results more generally within a formal model; and finally, section V offers some concluding remarks.

## **II. Review of Related Literature**

The existing literature introduces various legal mechanisms that could potentially remedy the holdup problem. For the purpose of this review, it is useful to cast them into three main approaches, which differ on the basis of the solution scheme they employ. The first approach is premised on the notion that the holdup problem could be resolved if some of the reliance cost were shifted from the relying party to her counterpart, in the event that negotiations failed. The intuition underlying this approach is that such a shift causes the relying party to treat her investment cost as retrievable, rather than sunk, and it thereby defuses her bargaining vulnerability that would otherwise hinder reliance. Several such rules are reviewed below, and the necessary conditions for their successful application are examined.

A second approach to resolving the problem is to offer legal enforcement of specific precontractual commitments, if they are aimed at eliciting the reliance of their recipient. The

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and certainty of proof of particular items of damage and the likelihood that unprovable damages have been suffered." Therefore, even if the parties can predict that the commitment would be viewed as an "option contract," much ambiguity remains with respect to the ultimate consequence of its withdrawal.

intuition here is that non-relying parties generally gain from the reliance of their counterparts, and, accordingly, wish to encourage it by committing not to engage in holdup. Hence, by rendering such commitments enforceable, there is reason to believe that commitments would both be made, and efficiently relied upon.

Finally, the third approach is to apply liability only when a full-fledged contract had been formed, and subsequently breached. The intuition of that approach is that the parties can transform precontractual reliance into ordinary contractual reliance, if they only agree to enter the contract early enough. This approach, therefore, encourages them to take that path, and to thereby avoid the holdup problem to begin with.

Each of these approaches, therefore, offers a distinct solution concept to the problem at hand. There are next reviewed in somewhat more detail.

#### A. Shifting the Cost of Reliance

The holdup problem arises when a party can take advantage of the sunk nature of her counterpart's investment. It therefore stands to reason that the problem could be alleviated if the relying party's sunk cost could be nevertheless recovered. Of course, one cannot transform a sunk cost into recoverable cost by the mere instruction of a legal rule. However, the legal rule *can* make a sunk cost appear as recoverable, by providing that a relying party would be compensated if, for any reason, she fails to capture the hoped-for benefit. The first set of solutions therefore seeks to achieve that goal by awarding damages to the relying party in the event of failure to contract. Three such solutions are next explicitly considered.

*The Sharing Rule:* Stated by Lucian Bebchuk and Omri Ben Shahaar,<sup>7</sup> and in a close variation by Avery Katz,<sup>8</sup> the sharing rule provides that in the event that parties fail to reach a contractual agreement after reliance had been sunk, they would share in the cost of reliance in proportion to their relative bargaining power. Thus, if a party would capture, say, a share of  $\alpha$

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<sup>7</sup> Lucian Bebchuk and Omri Ben Shahaar, "Precontractual Reliance," 30 J. Legal Stud. 423 (2001).

<sup>8</sup> Avery Katz, *When Should an Offer Stick? The Economics of Promissory Estoppel in Preliminary Negotiations*, 105 Yale L.J. 1249 (1996). In Katz's formulation, the relying party chooses the *timing* of investment rather than its *magnitude*. Apart from this variation, however, the solution to the problem is essentially equivalent.

from the benefit of reliance if negotiations succeeded, then she would also be made to bear a portion of  $\alpha$  from the cost of reliance if negotiations failed.

Intuitively, this rule would generate an optimal incentive to invest, because it would cause the relying party to internalize a fixed portion of both the upside and the downside of her investment. But as the maximization of a fixed proportion of a value can only be attained if the value itself is maximized, the sharing rule would cause her to also maximize the social investment value.<sup>9</sup>

Of course, for the solution to become practically viable, the court must be able to verify the parties' relative bargaining power. However, as noted by Avery Katz as well as by Bebchuk and Ben Shahaar, the notion that courts could ascertain such information with any degree of accuracy is quite implausible. Indeed, the determinants of bargaining power are notoriously elusive even as a theoretical concept, and that is of course all the more true if not all determinants of bargaining power are also verifiable. It should be further noted that the problem of unverifiable information is particularly acute in this setting because the solution is meant to apply specifically when a contract is eventually *not* formed. As there is thus no consensual agreement on which to draw factual inferences about bargaining power, the pool of available evidence is likely to be exceedingly scarce.

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<sup>9</sup> Formally, suppose that the cost of precontractual reliance is given by  $x$ ; the buyer's valuation by  $v(x)$ ; the seller's realized production cost by  $c$ ; the density of  $c$  by  $f(c)$ ; and the buyer's share of the surplus by  $\alpha$ . The

social objective is thus to maximize  $\int_0^{v(x)} (v(x) - c)f(c)dc - x$ . Under the sharing rule, the relying party's ex post

reservation value would be given by  $v(x) - \alpha x$ , reflecting her post-reliance valuation minus the proportion of reliance cost that is retrievable in damages. The seller's reservation value would accordingly be given by  $c + (1 - \alpha)x$ , her cost of production plus the proportion of reliance cost to which she would be liable if negotiations break down. Bebchuk and Ben Shahaar assume that the buyer's valuation always exceeds the seller's cost. Embracing that assumption, we find that the buyer's expected share of the bargaining pie would equal

$\alpha \left[ (v(x) - \alpha x) - \left( \int_0^{v(x)} c f(c) dc + (1 - \alpha)x \right) \right]$ , or  $\alpha \left( \int_0^{v(x)} (v(x) - c) f(c) dc - x \right)$ . Hence, it is easy to verify that the

same level of reliance maximizes the social welfare function and the buyer's expected payoff. The buyer's reliance incentive is thus optimal.



*Liability for Ex Post Opportunism:* Another solution introduced by Bebchuk and Ben Shahaar is premised on a different regulatory strategy.<sup>10</sup> Under that proposal, the relying party would be granted a legal entitlement to recoup her investment cost, provided that contracting is ex post efficient. Thus, in settings where trade is indeed desirable, but the non-relying party insists on a bargaining stance that, if accepted, would prevent such recoupment, then the relying party could refuse to contract and instead recover damages for her full reliance expenses. The proposed rule would thus tackle the problem simply by rendering the holdup demand unbeneficial to its initiator: liability for the full reliance cost would by definition exceed the profit she would stand to gain by preventing recoupment from her counterpart. On the flip side of the coin, the relying party would be certain to recover at least the cost incurred in reliance, and hence she would no longer be deterred from engaging in the precontractual investment.

This solution too, however, hinges on some challenging assumptions, questioning its actual application. Most notably, for the rule to be workable, the court must be able to ascertain the *reason* for which negotiations had failed. Obviously, not all failures to reach an agreement stem from excessive demands, intended to take advantage of the relying party's sunk investment. In many cases they fail simply because, in the course of negotiations, the parties come to realize that trade could not produce a mutual benefit.

The assumption that courts can verify that a contract *should* have been formed, although it was not formed in fact, is indeed critical for the rule to serve its intended function. If, contrary to this assumption, precontractual liability were applied across the board, including in cases where trade is ex post inefficient, then two adverse consequences would follow: first, the relying party would be induced to over-invest, as she would recover her reliance costs always, and particularly when it produces no social value, as contracting is inefficient; and second, it would deter her counterpart from entering into negotiations in the first place, as it would subject her to liability even if she is not guilty of opportunism in any way. Either of these adverse effects may potentially produce a heavy toll. Hence, the more likely a court is to err about the ex post efficiency of trade, the heavier the downside associated with the proposed scheme.

*Strict Liability Capped by the Level of Optimal Reliance:* Yet a third option stated by Bebchuk and Ben Shahaar is a variation of the previous one, but it relies on somewhat different

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<sup>10</sup> *supra* note 7, at 435-438.

informational assumptions.<sup>11</sup> Under this rule, the relying party would be granted a legal entitlement to recoup the *socially optimal level of reliance* (regardless of the amount invested in fact.) As in the previous version, a counterpart refusing to allow her to recoup, would be held liable for those costs. Unlike the previous solution, however, liability under this rule would be imposed regardless of the reason for which negotiations had failed, and hence the court would be relieved of the burden to inquire into the causes of that failure. This will not create an incentive to invest excessively, as here, by construction, liability would extend only to the socially optimal investment level, not to any additional invested amount.

But while the rule does indeed relieve the court of one heavy burden, it does so only to impose another. Namely, for the rule to be workable, the court must determine the magnitude of the socially optimal investment level, which might depart considerably from level actually chosen. To evaluate this magnitude, it must inquire into the cost of each marginal unit of investment, and then compare it to the marginal utility it produces. Furthermore, it must discount the benefit by the probability of efficient trade, as perceived at the time in which the investment had been made. These are clearly daunting tasks by any account. In turn, they raise a serious question as to whether they can truly be fulfilled with a reasonable degree of precision and at sensible cost.

*Doctrinal Note:* The difficulties associated with the various proposals associated with this approach suggest that one is indeed unlikely to find legal rules that apply liability merely on the basis of reliance by a negotiating counterpart. This hypothesis is vindicated by actual doctrine.<sup>12</sup> A recent survey conducted by Alan Schwartz and Robert Scott additionally shows that when liability is applied, it is generally due to a violation of some voluntary commitment a party had made during negotiations, and which had the effect of inducing reliance.<sup>13</sup> Such commitments indeed take center stage in the analysis developed in this paper. However, prior to delving into the proposed regime, the next sub-section reviews the existing theoretical literature pertaining to such voluntary commitments.

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<sup>11</sup> *supra* note 7, at 439-441.

<sup>12</sup> For a review of the possible grounds for recovery *see* Farnsworth, *supra* note 2, at 222, 229-243; Schwartz and Scott, *supra* note 2, at 671-672.

<sup>13</sup> *Id.*

### b. Liability on the Basis of a Voluntary Commitment

The mechanism contemplated by the second approach is premised on the following line of reasoning: promisors are often motivated to undertake commitments because they wish to encourage their counterparts to invest in reliance. Recipients, in turn, would be happy to rely on those commitments, provided that they are credible. The law may thus facilitate efficient investment simply by providing the framework for enforcement of voluntary commitments. To do so, the court need not be able to verify facts such as the socially optimal level of reliance, the ex post efficiency of trade, or the parties' relative bargaining power. The information it needs consists of far more accessible facts, namely the content of the commitment; the fact that it had been breached; and the magnitude of damage caused, with reference to the applicable measure of damages.

Several rules fit within this mold. To name the most prominent, the "firm offer" rule, provides that an offeror may bind herself to an irrevocable offer.<sup>14</sup> Once it is made, the offeree is free to accept it even if the offeror had attempted to withdraw the offer prior to the offeree's acceptance. Hence, by failing to honor the offer once it is accepted, the offeror commits a breach of contract, which in turn subjects her to liability, typically in the form of expectation damages. By making a firm offer, therefore, the offeror undertakes a voluntary commitment, generally protected by the expectation measure.

In a similar vein, the promissory estoppel rule, or the "no-retraction principle," proposed by Omri Ben Shahaar,<sup>15</sup> limit a negotiating party's freedom to retract from a bargaining stance once it is communicated to her counterpart. If such a party retracts nevertheless, she must compensate her counterpart for her reliance expenses. Hence, the commitment under that standard is protected by the remedy of reliance damages. Yet another possibility is for the parties to stipulate some other, agreed upon amount. The commitment to pay termination fees is

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<sup>14</sup> Uniform Commercial Code, §2-205 reads: "An offer by a merchant to buy or sell goods in a signed record that by its terms gives assurance that it will be held open is not revocable, for lack of consideration, during the time stated or if no time is stated for a reasonable time, but in no event may such period of irrevocability exceed three months; Any such term of assurance in a form supplied by the offeree must be separately signed by the offeror."

<sup>15</sup> See Omri Ben Shahaar, "Contracts without Consent: Exploring a New Basis for Contractual Liability," 152 U. of Pennsylvania Law Review 1829 (2004); Bebchuk and Ben Shahaar, supra note 7.

one example of such a practice,<sup>16</sup> and another is a “lockup” provision, sometimes used by corporations to lure buyers to make a friendly takeover bid.<sup>17</sup>

As the voluntary commitment approach conditions liability on a party’s explicit consent to be bound, it alleviates the concern that parties might be inefficiently deterred from engaging in negotiations. However, it does not seem to relieve the concern for excessive investment, once the commitment is made.<sup>18</sup> Namely, if the desirability of contracting is less than certain, then by rendering a commitment, the promisor presumably ensures the promisee’s reliance against the contingency of inefficient trade. As the promisee can then exercise the commitment even when reliance produces no social value, she is induced to rely excessively. At the end of the day, these rules seem merely to make the problem shift form, turning an under-investor into an over-investor. Hence, if the commitment indeed addresses the problem, it seems to be doing so only in a partial, second-best fashion.

Moreover, termination fees and a lockup provision may generate an additional difficulty in the form of opportunistic behavior by promisees. As liquidated amounts do not link the magnitude of liability to actual reliance or expectation, they may attract promisees who have no intention of ever forming a contract or of relying upon it. Having no genuine interest in completing the deal, opportunistic promisees may merely seek to collect the damage award upon failure to reach agreement. Such a promisee may simply insist on bargaining demands she is sure to be rejected, and then extract a handsome profit when negotiations break down. Potential promisors, seeking to protect themselves against opportunism of that sort, may thus be forced to refrain from making the commitment in the first place.

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<sup>16</sup> See Judd F. Sneirson, *Merger Agreements, Termination Fees, and the Contract-Corporate Tension*, 2002 Colum. Bus. L. Rev. 573; Thomas A. Swett, *Comment: Merger Terminations After Bell Atlantic: Applying a Liquidated Damages Analysis to Termination Fee Provisions*, 70 U. Colo. L. Rev. 341 (1999).

<sup>17</sup> Under a “lockup” provision, a friendly bidder is offered a valuable entitlement if its bid is ultimately rejected. As the entitlement can be interpreted as compensation for lost reliance expenses, it is conducive to alleviating the holdup problem. *See Id.*

<sup>18</sup> Note that existing literature does suggest that a precontractual commitment may resolve the holdup problem, but the model supporting that claim is one where trade is always efficient, and hence reliance can never be excessive as a matter of definition. *See* Ben Shahar, *supra* note 15; Bebchuk and Ben Shahar, *supra* note 7.

### c. Liability on the Basis of a Full-Fledged Contract

The solutions reviewed above were all premised on the assumption that some reliance costs needed to be incurred *prior* to the moment of contracting. Accordingly, the difficulty to control the parties' incentives at that stage emerged from the fact that the parties had not yet reached a meeting of the minds, and have not expressed any intent to be bound contractually. However, the premise that some reliance must be made prior to contracting can itself be challenged. After all, the option is always open to the parties to enter a contract sooner, and to thereby transform the precontractual investment into a contractual one. Under this view, therefore, there might not be a general need to apply precontractual liability. Whatever reliance needs to be incurred, let it be protected by a full, standard contract, not through costly, extra-contractual means.

The notion that a well-specified contract can induce both efficient reliance and efficient trade has occupied a large volume of economic literature, and in turn, has produced a wide array of contractual solutions. A very simple and compelling solution has been initially proposed by Robert Cooter in 1985,<sup>19</sup> and was subsequently generalized by Georg Nöldeke and Klaus Schmidt in 1995.<sup>20</sup> As demonstrated in these contributions, the desired aim can be produced by a simple term of liquidated damages.<sup>21</sup> To see the basic intuition, suppose that the stipulated amount is set at the level of the promisee's expectation interest. Trade would then be carried out efficiently, as the promisor would be induced to breach it if and only if the cost of performance exceeds its value to the promisee; and reliance would similarly be efficient, because the relying party would capture the investment's upside whenever trade is efficient (as the contract is accordingly performed) while bearing its downside whenever it is not (as the contract is accordingly breached, and reliance is not compensated.)<sup>22</sup>

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<sup>19</sup> Robert Cooter, "Unity in Tort, Contract, and Property: The Model of Precaution," 73 Cal. L. Rev. 1 (1985).

<sup>20</sup> Georg Nöldeke & Klaus M. Schmidt, "Option Contracts and Renegotiation: A Solution to the Hold-Up Problem," 26 RAND J. Econ, 163 (1995).

<sup>21</sup> As Nöldeke and Schmidt point out, a contract which includes a liquidated damages term can be viewed as an option, under which the promisor may choose to either perform a specified action, or else pay the stipulated amount. Hence, in their paper, such an arrangement is referred to as an "option contract." See Nöldeke and Schmidt, *supra* note 20.

<sup>22</sup> Another interesting solution is due to Aaron Edlin & Stefan Riechelstein, "Holdups, Standard Breach Remedies, and Optimal Investment," 86 Am. Econ. Rev. 478 (1996). Edlin and Riechelstein show that when the remedy for

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breach is either expectation damages or specific performance, the quantity term can serve as an instrument to produce optimal investment. In line with prior literature, they observe that when trade is ex post inefficient, and the remedy for breach nevertheless applies, the promisee extracts a positive return for her reliance investment even though reliance had produced no social value. The possibility of such states of the world therefore generates a tendency to over-invest. However, by manipulating the quantity term, the parties can offset that effect, to produce the socially optimal investment. Namely, if they specify a quantity that is smaller than the level they would actually wish to trade if trade is efficient, then in those states of the world a new contract would need to be formed to govern the trade of the additionally desired quantity. As that contract would be made only after reliance had already been sunk, it would involve a holdup. Hence, if quantity is set optimally, these forces of over-investment and under-investment would exactly balance each other out.

Other contractual solutions include Bentley Macleod & James Malcomson, "*Investments, Holdup and the Form of Market Contracts*," 83 Am. Econ. Rev. 811 (1993) (showing that under certain conditions, efficient investment can be induced if the contract stipulates three distinct payments – one applicable in the event of trade; another when an outside option is consummated in lieu of trade; and a third when trade does not occur at all); Benjamin Hermalin & Michael Katz, "*Judicial Modification of Contracts between Sophisticated Parties: A More Complete View of Incomplete Contracts and their Breach*," 9 J. L. Econ. Org. 230 (1993) (showing that "fill-in-the-price contracts," which entitle the relying party to make a take-it-or-leave-it offer after uncertainty is resolved can also induce efficient investment); Philippe Aghion, Mathias Dewatripont & Patrick Rey, "*Renegotiation Design with Unverifiable Information*," 62 Econometrica 257 (1994) (demonstrating that efficient investment can be generated if the parties can bind themselves to a particular renegotiation game).

Finally, the implementation literature has proposed a solution of the following form. Suppose the seller is the relying party, and the contract stipulates that once uncertainty is resolved ex post, each party simultaneously reports both parties' valuations to the court. If the two reports match and suggest that trade is efficient, then the court orders the parties to trade at a price equal to the buyer's valuation. Otherwise, the court orders a discharge of the contract. It is easy to verify that if one party is known by the other to tell the truth, it is also optimal for the other to be truthful. Hence, truth-telling is a Nash equilibrium. Furthermore, the relying party, under this mechanism, captures the entire surplus ex post, and hence relies optimally. To allow for sharing of the surplus with the other party, it is possible to stipulate an upfront payment from the relying party to her counterpart before reliance takes place. Whereas the simple mechanism described may generate other equilibria as well, it has been shown that more sophisticated mechanisms can generate a unique truth-telling equilibrium under fairly general conditions. See John Moore & Rafael Repullo, "*Subgame Perfect Implementation*," 56 Econometrica 1191 (1988); William Rogerson, "*Contractual Solutions to the Holdup Problem*," 59 Rev. Econ. Stud., 774 (1992); Yeon-Koo Che & Donald Hausch, "*Cooperative Investments and the Value of Contracting*," 89 Am. Econ. Rev. 125 (1999). These mechanisms, however, have been criticized for their underlying assumption that renegotiation is impossible if the contract had been judicially discharged. If, instead, one would allow for renegotiations in that setting, then the threat of a discharge would no longer be credible, and hence the truth-telling equilibrium would require more

The contractual approach is indeed effective in generating the desired ends, provided that the parties are ready to enter a full-fledged contract at the time reliance needs to be made. But of course, in reality it is apparent that parties do not always take that path, and in fact they often do engage in reliance at the precontractual stage. What is more, it is likely that they do so with good reason, as delaying the moment of contracting carries a significant benefit, not only a cost. The benefit lies in the fact that early investments in reliance typically reduce the level of uncertainty, and may thereby also reduce substantially the cost of contracting. If the parties were to enter a contract notwithstanding a very high level of initial uncertainty, they would either have to spend an inflated sum in transaction costs to construct a reasonably complete and contingent contract, or alternatively to settle for a highly incomplete contract, which would cause the overall surplus to fall. It is therefore clear that some investments in reliance are optimally made before a contract is formed; and those investments, in turn, are susceptible to the hazards of holdup.

To illustrate this point, consider the example of a corporation seeking to buy a target company, but only provided that the target is in some sense attractive. It initially does not know the features of the target, and can only discover them by conducting due-diligence. Theoretically, the parties could avoid the holdup problem by entering a contract before the inquiry is made, which would specify a distinct legal consequence to each of the countless different findings that the investigation might yield. That, however, would seem a highly inefficient strategy. A more cost-effective approach in most cases would be to invest precontractually, despite the holdup problem, and then once the results are in, to write a far simpler contract that would address only a restricted set of possible contingencies. In general, therefore, the option of contracting may well be dominated by the possibility of precontractual reliance even at the price of an unresolved holdup problem. The prevalence of such investments in the real world certainly seems to suggest that this is often the case.

### Partial Summary

The existing literature, as reviewed above, demonstrate the difficulty of identifying a solution which, on the one hand, would induce efficient reliance and trade, and on the other,

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restrictive assumptions. For a discussion, See Patrick Schmitz, "The Holdup Problem and Incomplete Contracts: A Survey of Recent Topics in Contract Theory," 53 Bull. Econ. Res. 1 (2001).

would be practically administrable, and depend only on generally verifiable information. The solution scheme presented next attempts to address both of these problems. It most closely resembles the proposals identified in the second approach reviewed above, since it is based on a legal regime under which voluntary precontractual commitments are enforced. However, it overcomes the major impediment associated with that solution, namely that of inducing excessive investment. In the following section I begin with a numerical example to generate the main intuitions. The subsequent section will then develop the argument more generally, and within the context of a formal model.

### **III. The Precontractual Commitment - A Numerical Example**

#### *a. The General Setup of the Example*

Consider the following scheme of negotiations, summarized in Table 1 below. A seller and a buyer negotiate a possible sale of a widget. Suppose that the buyer's valuation of the widget absent reliance is 100 and is given with certainty; whereas the seller's cost of production is initially uncertain. Suppose further that production will cost 20 with probability of 0.25; 100 with probability of 0.25; and 300 with probability of 0.5.<sup>23</sup> The parties are assumed to hold equal bargaining power, and are assumed to be risk neutral.

At the preliminary stage, before the cost to the seller is realized, the buyer must choose whether to engage in reliance. The opportunity to rely is time-sensitive, in the sense that the buyer cannot postpone the investment until the seller's cost is realized. She thus faces a choice:

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<sup>23</sup> Although in this particular example the source of uncertainty is the buyer's cost of production, it would be equivalent to assume that uncertainty pertains either to the buyer's valuation or to both the cost and the valuation. The important aspect of this assumption is only that the ultimate *difference* between the buyer's valuation of the widget and the seller's cost of manufacturing it is not known with certainty. The current setup is thus chosen for purposes of concreteness only.



If she relies and a contract is formed, then she gains a certain benefit from reliance; however, if she relies and negotiations fail, she captures no benefit and the cost of reliance goes to waste.

**TABLE 1**

<b>Value to Buyer (Before Reliance)</b>	100
<b>Cost to Seller</b>	
25% Chance:	20
25% Chance:	100
50% Chance:	300
<b>Investment Opportunities:</b>	
<u>No Investment</u> : Cost: 0	Increase in Buyer's Valuation: 0
<u>Investment 1</u> : Cost: 10	Increase in Buyer's Valuation: 30
<u>Investment 2</u> : Cost: 75	Increase in Buyer's Valuation: 100
<b>Equal Bargaining Power</b>	

In light of this tradeoff, the buyer must choose whether to invest, and if so, at what level. The following investment options are available to her: Under Investment 1, she would incur an immediate cost of 10, and thereby raise her valuation of the widget from 100 to 130. Alternatively, under Investment 2, she would bear an initial cost of 75 and enhance her valuation to 200. Obviously, she may also choose not to invest at all. Note that both investment options increase the joint surplus, provided that the parties proceed to contract, i.e., when the seller's cost is 20 or 100, but neither yields any benefit if the realized cost is 300, in which case negotiations fail and the investment cost is wasted. After the reliance choice has been made, the production cost is realized and the parties decide whether to contract. If a contract is formed, the seller then produces the widget.

Let us now examine the social desirability of each of the buyer's investment options. Taking into account the 50% chance of non-contracting, Investment 1 yields a gross expected return of 15 at a mere cost of 10, and hence produces a net social value of 5. Investment 2 yields a gross expected return of 50 at a cost of 75, and thus generates a net social value of -25. Finally, a choice to refrain from reliance altogether generates neither a cost nor a benefit, and thus yields an expected net return of zero. Investment 1 may therefore be referred to as "socially optimal reliance"; a decision to refrain from any investment constitutes "under-reliance"; and Investment 2 generates "over-reliance".

*b. The Problem of Holdup*

The problem of holdup arises due to imperfect alignment between the social ordering of the investment alternatives as stated above, and the buyer's private incentive to maximize her private expected surplus. In the current setup, the divergence between private incentives and the social objective arises because the buyer bears the entire cost of reliance, but in the event of contracting, the seller takes advantage of the fact that the cost is sunk, and appropriates a share of the return. As the buyer thus captures only a portion of the return, she does not internalize the investment's full social value.

In the context of the example, the problem of holdup can be easily identified. Initially observe that if the buyer refrains from any reliance, the parties contract if and only if the cost of production is 20. Since the value to the buyer is 100, the price that generates an equal division of the surplus is 60. Alternatively, if the buyer chooses the socially optimal investment (Investment 1), the price that splits the ex post surplus rises to 75.<sup>24</sup> Thus, although reliance has increased the buyer's valuation by 30, she herself captures only 50% of that amount. Given the ex ante probability of contracting of 0.5, Investment 1 thus yields an expected private return of 7.5. As the buyer's benefit thus falls below the cost of 10, Investment 1 would not be made. The same argument, of course, applies all the more forcefully to Investment 2, under which the buyer would bear the full cost of 75, but obtain an expected private payoff of 25. The buyer in this

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<sup>24</sup>  $20 + 0.5 * (130 - 20) = 75$ . Note that since the cost of the investment is sunk at the time of contracting, it has no effect on the outcome of bargaining.

example therefore refrains from reliance altogether. From a social perspective, investment is thus inadequate.

*c. The Commitment*

Suppose that the seller extends a commitment to the buyer, binding her not to charge a price exceeding some specified value. Pursuant to such a commitment, the buyer would remain free to bargain for a lower price if she finds that she can, but the seller would not be allowed to charge a higher price. The following paragraphs examine the possible effect of such a commitment on the buyer's incentive to rely.

At the time the investment decision is made, the buyer is concerned with two types of adverse developments that might undermine her incentive to invest. As will be seen, both of these concerns could be substantially mitigated by a commitment of the form stated above. First, the buyer knows that under some contingencies the realized cost would be such that there would be no gains from trade. Absent a commitment, trade would then not occur, and the reliance investment would therefore yield no private benefit. However, if a commitment could be exercised even so, then the buyer would still hold the seller to the deal, and effectively reap the benefits of reliance. Hence, in the presence of a commitment, the downside associated with such contingencies would be reduced, or even entirely eliminated.

The second adverse development the commitment might protect the buyer from is of course that of holdup. As the commitment would bind the seller to its stipulated terms, the probability of renegotiations would fall, and with it the buyer's vulnerability to ex post appropriation of her reliance returns. The lower the exercise price, the more often would the buyer find it desirable to exercise the commitment, and hence the lower the probability of holdup would become.

The commitment thus functions as a shield against these two adverse eventualities – that of failure to trade and that of holdup. The more generous the commitment price, the more effective the shield becomes.

There are two polar cases of commitment types worth considering explicitly: one in which a commitment provides full protection against the possible downsides of reliance, and one in which the commitment offers no protection whatsoever. A commitment fully protects the

buyer if it stipulates a sufficiently low price, such that the buyer always wishes to exercise it regardless of the ultimate realization of cost. An example of such an exercise price is zero: If the buyer can always “buy” the widget at the cost of zero, she knows she would always do better by exercising the commitment than by engaging in ex post negotiations over the price. In such a scenario, as the price is effectively predetermined, the realization of the seller’s cost is inconsequential to the buyer’s ultimate gains from trade. In particular, the buyer faces no loss when there are no gains from trade, as she may exercise the commitment nonetheless; and similarly, there is no risk of holdup, as there is never a phase of ex post negotiations over the price. Hence, both types of potential loss that would hinder precontractual investment absent a commitment are entirely eliminated. The buyer is fully protected.

Full protection, however, encourages the buyer to over-rely. As she expects to exercise the commitment always, she invests as if the investment yields value under all states of the world, even when trade generates no social value. Whereas, in the social calculus, the possibility that costs would exceed benefits reduces the desirability of a precontractual sunk investment, in the buyer’s eyes the benefits from reliance are certain. Thus, under full protection, the buyer disregards the social downside of the investment, and consequently tends to invest too much.

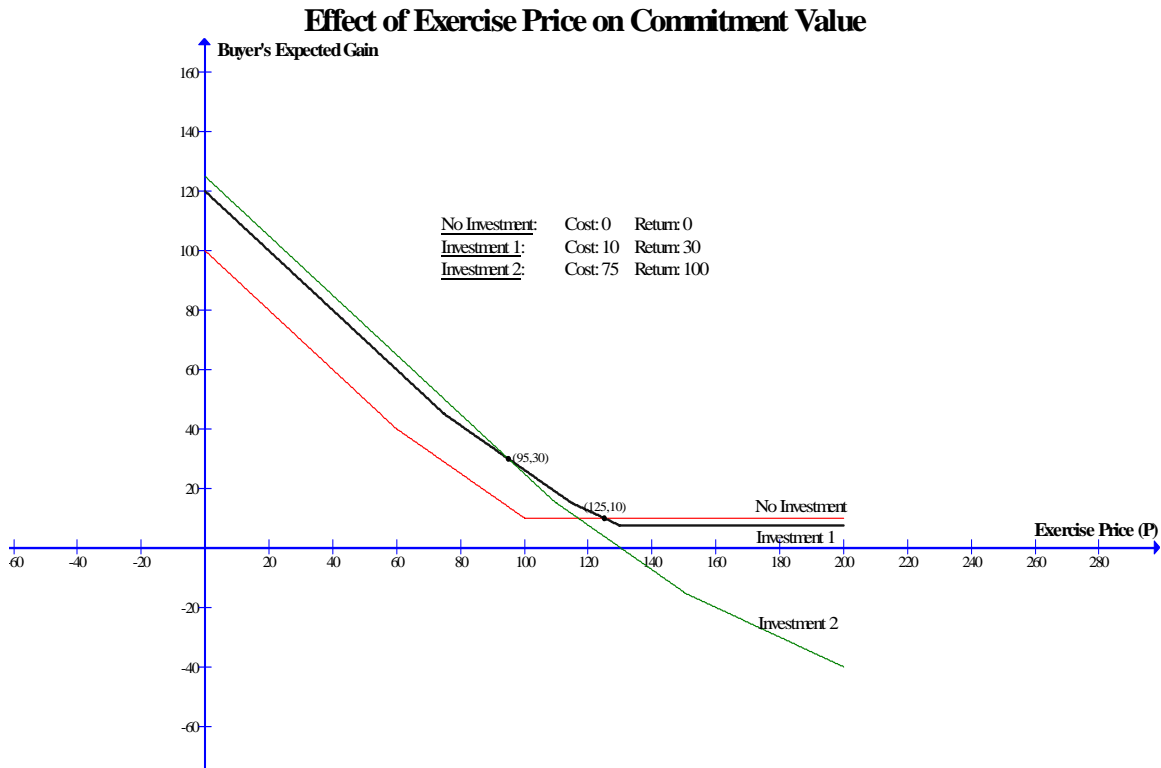
Returning to the numerical example, recall that Investment 2 is the option that amounts to over-reliance. Indeed, if contracting were certain, Investment 2 would yield the greatest difference between cost and return. However, when taking into account the 50% chance that exchange would be socially undesirable (when production cost equals 300), the expected social value falls below that of Investment 1. This consideration, however, fails to factor into the buyer’s decision. When a commitment offers full protection, she selects Investment 2, and thereby maximizes her private gains.

The other polar case is that of a commitment which offers no protection. Such a commitment is one that stipulates a price sufficiently high so as to always exceed the buyer’s valuation. Indeed, such a commitment is equivalent to no commitment at all, since it is – by construction – never beneficial for the buyer to exercise it. In the context of the example, such a commitment would stipulate a price of 200 or above. As the commitment could never be beneficially exercised, the resulting reliance choice is the same as if no commitment were extended. In that extreme case, the holdup problem plays out in full force, and the buyer consequently under-relies.

What happens when the price is set in between the two extreme cases delineated above? As the price continuously rises from zero upward, the commitment is providing less and less protection to the buyer against ex post holdup and possible non-contracting. Thus, as the price rises, excessive investments become gradually less desirable to the buyer. There comes a point in which the buyer's private incentive to invest is diluted just enough so as to induce her to engage in the socially optimal level of reliance. That price defines the socially optimal commitment. As the price increases further, the buyer's incentive to rely continues to decline, until it reaches a minimum as the price approaches 200.

Note that as the exercise price can be determined within a continuous range, there exists a price to generate any desired level of protection. Hence, in particular, the level of protection which entirely eliminates the possibility of holdup, but completely preserves the risk of non-contracting, is generated by some price as well. In the context of the example, it can be easily established that any exercise price within the range between 95 and 125 would generate socially optimal reliance.

This result is illustrated graphically in the diagram below. Each of three lines corresponds to a different investment opportunity (Investments 1,2 and no-investment). As demonstrated by the diagram, Investment 1 (drawn in bold) yields the greatest expected gains to the buyer when the exercise price lies within the range between 95 and 125. Thus, any commitment stipulating a price within that range yields the socially optimal level of reliance.



Let us now turn to examine whether the optimal effect of a commitment can be sustained if it is enforced with a monetary remedy, rather than with the remedy of specific performance, as assumed above. In particular, let us examine the reliance and expectation measures, as those are the ones regularly applied.

A similar intuition to that developed above can also be used to show that both these measures would sustain the optimal effect of the commitment. To see this, begin by considering again a commitment that the buyer would never seek to exercise. In that case, neither exercise nor breach would ever occur, and hence the buyer would rely inadequately. Conversely, consider a commitment that the buyer would wish to exercise always. In that case, both damage measures, applied in the case of breach, would guarantee recoupment of the buyer's reliance cost. As the buyer would thus never end up with a net loss from reliance, she would not internalize the possibility that reliance would prove socially wasteful, as there are no gains to be made from trade. The buyer, under such a commitment, would therefore rely excessively. It follows that, given either remedy, an intermediate commitment price must exist, which would

encourage the buyer to exercise only in some states of the world and to renegotiate the terms of trade in other states. The buyer would then invest more than she would absent a commitment, but less than she would if she expected to recoup her reliance costs under all eventualities. In particular, some commitment would exist that would induce the socially optimal investment level.<sup>25</sup>

*d. The Choice of an Optimal Commitment*

Having established that a socially optimal commitment exists, it still needs to be shown that the seller will in fact carry an incentive to offer it to the buyer. This result is demonstrated by showing that if the optimal commitment is not made, then one of the parties will be induced to offer the other a transfer payment in exchange for the right to have the socially optimal commitment granted. As this observation holds for any deviation from the socially optimal commitment, it follows that the socially optimal commitment Pareto dominates any alternative arrangement.

The reasoning underlying this result traces the standard argument for why contracts are generally efficient. It is conveniently established by way of contradiction. Suppose that the seller found it privately beneficial to deviate from the socially optimal commitment by offering a higher exercise price than the optimal level. As a result, the buyer's return from reliance would fall and she would thus under-invest. As the contractual pie would shrink as a consequence, it follows that the seller's gain from deviation would be smaller than the buyer's loss. But then a potential would arise for a mutually beneficial transaction, in which the buyer "buys" her right to be offered the socially optimal commitment in exchange for a side-payment. As the buyer's gain from the move back to the socially optimal commitment would exceed the seller's loss, the buyer could fully compensate the seller for the move, while still capturing a positive surplus.

If, alternatively, we assumed that the deviation from the socially optimal commitment was in the opposite direction, that is, that the commitment stipulated a lower exercise price than the optimal level, then symmetric reasoning would apply. In that case, the seller would pay the

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<sup>25</sup> For a formal proof of these points, see Propositions 2 and 3 below.

buyer for the right to move back to the socially optimal commitment. Thus, regardless of the parties' relative bargaining abilities, the socially optimal commitment would be mutually preferred to any possible alternative.

## IV. Formal Model

### A. General Setup

A risk neutral buyer and a risk neutral seller consider entering a contract for the sale of a widget. The process of contracting consists of two consecutive stages: a precontractual phase ("period 1") and a contractual one ("period 2".) In period 1, the buyer attaches some value  $v$  to the widget, and may choose to make a relationship-specific reliance investment that would increase her valuation in period 2. Let  $x \geq 0$  denote the cost of that investment and let  $r(x)$  denote the monetary value of its return to the buyer. I assume that  $r(x)$  is continuous and concave. In addition, I assume that  $r(x)$  is observable to both parties, but not necessarily verifiable to a court of law.

Let  $c \in [0, \bar{c}]$  denote the seller's reservation value. In period 1,  $c$  is uncertain, but its distribution is observable to both parties.  $f(c)$  is the continuous density of  $c$ , and  $F(c)$  is the corresponding cumulative distribution function. To make the analysis meaningful, I further assume that there exists some positive probability that an exchange in period 2 would be mutually beneficial, so that  $F(v) > 0$ .

In period 2 the realization of  $c$  is revealed and the parties choose whether to contract. This realization, however, remains unverifiable to a court. The ex post value of contracting is taken to be  $v + r(x) - c$  if it is positive, or zero otherwise.

Bargaining is assumed to take the following, simple form: the buyer is assumed to receive a proportional share of  $\theta$  from the surplus, where  $\theta \in [0, 1]$ , and the seller receives the remaining share of  $1 - \theta$ . If, in light of the realized cost the surplus is of a negative magnitude, then no agreement follows.



### B. Social Optimum

The social optimum is derived by backward induction. In period 2, after  $x$  has been chosen and  $c$  realized, exchange is desirable if and only if:

$$v + r(x) \geq c$$

(1)

The probability that contracting would be desirable in period 2 is therefore given by  $F(v + r(x))$ .

Define  $S(x)$  as the expected social net surplus, as viewed in period 1. Hence,

$$S(x) = \int_0^{v+r(x)} (v + r(x) - c) f(c) dc - x \quad (2)$$

The first-order-condition is thus given by:

$$S'(x) = F(v + r(x))r'(x) - 1 \quad (3)$$

implying that at the optimum:

$$F(v + r(x))r'(x) = 1 \quad (4)$$

I assume the solution to (4) is unique, and denote the level of  $x$  satisfying (4) as  $x^*$ . The interpretation of (4) is as follows: The left-hand-side represents the net social benefit arising

from a marginal dollar invested in reliance. Benefits comprise of two components: First, an additional unit of  $x$  increases the probability that a beneficial exchange would become feasible; and second, given that a contract is formed, the addition of  $x$  raises the social surplus by enhancing  $r(x)$ . Investment in  $x$  is socially desirable as long as the marginal benefits exceed the marginal cost of  $x$ . At the optimum, an additional dollar spent on reliance should increase the expected benefit accruing from it by exactly a dollar. The right hand side of (4) therefore equals 1.

### C. The Problem of Holdup

Let  $B(x)$  denote the buyer's expected payoff as viewed in period 1. Thus,

$$B(x) = \theta \int_0^{v+r(x)} (v+r(x)-c) f(c) dc - x. \quad (5)$$

Hence, the privately optimal investment by the buyer is given by:

$$\theta F(v+r(x)) r'(x) = 1. \quad (6)$$

Denote by  $\bar{x}$  the level of reliance chosen by the buyer. Observe that (6) is identical to (4), except that the benefits represented by the left-hand-side are discounted by  $\theta$ , the measure of the buyer's bargaining power. Further observe that  $\bar{x}$  may in theory be either greater or smaller than  $x^*$ .<sup>26</sup> Intuitively, the reason is that an increase in reliance generates two opposing effects: given that trade occurs, the buyer's optimal strategy is to under-invest, as she captures

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<sup>26</sup> To see that, notice that  $x$  may be either increasing or decreasing with  $\theta$ , depending on the sign of  $r''(x)$ :

$$x'_{\theta} = - \frac{F(v+r(x)) r'(x)}{\theta (f(v+r(x)) r'(x)^2 + F(v+r(x)) r''(x))}$$

only a fraction of  $\theta$  from the investment's return; however, the probability of trade is itself enhanced with reliance, and therefore the buyer may wish to invest more in order to increase the chance of contracting. Thus, whether the buyer's invests too much or too little ultimately depends on the particular form of the investment function and the ex ante distribution of cost.

To focus on a solution to the holdup problem, I therefore assume for the remainder of the analysis that the buyer's privately optimal choice is to under-invest.

#### *D. The Effect of a Commitment*

Suppose that the seller commits not to demand a price exceeding some magnitude  $p$ . That commitment would then allow the buyer to either enter a contract at the price of  $p$ , or to renegotiate a different price. Further assume for now that the seller will not breach her commitment, and so the construction of an optimal remedy for breach is not yet required. This assumption will be relaxed shortly.

In such a setting, the buyer would opt for renegotiations if, in period 2, it transpires that trade is efficient, and that she could bargain for a lower price than the one specified in the commitment. Using notation, renegotiation thus requires that the following conditions be met:

$$c \leq v + r(x); \text{ and} \tag{7}$$

$$\theta(v + r(x) - c) \geq v + r(x) - p. \tag{8}$$

Note that (8) may in turn, be rewritten as:

$$c \leq v + r(x) - \frac{v + r(x) - p}{\theta}. \tag{8A}$$

Observe that if  $p \leq v + r(x)$  then (8) implies (7). Further note that if the commitment is to have any effect on the buyer's behavior, its stipulated price can never exceed the buyer's valuation of the widget, or otherwise the buyer could never benefit from it in period 2, as a

matter of definition. Hence, we can restrict attention to cases in which, indeed,  $p \leq v + r(x)$ , and accordingly assume that (8) is the necessary and sufficient condition for renegotiation.

It is now possible to define the buyer's expected surplus given a commitment. Denoting it by  $B^c(x)$ , we have:

$$B^c(x) = \int_0^{v+r(x)-\frac{v+r(x)-p}{\theta}} \theta(v+r(x)-c)f(c)dc + \int_{v+r(x)-\frac{v+r(x)-p}{\theta}}^{\bar{c}} (v+r(x)-p)f(c)dc - x \quad (9)$$

It is thus apparent from (9) that the commitment strikes a balance between states of the world in which the buyer is better off ex post renegotiating the terms of the contract, and states where she prefers to embrace the terms of the commitment. The nature of that balance is determined by the commitment price.

Taking the first-order-condition yields:

$$\left[ \theta F\left(v+r(x)-\frac{v+r(x)-p}{\theta}\right) + 1 - F\left(v+r(x)-\frac{v+r(x)-p}{\theta}\right) \right] r'(x) = 1 \quad (10)$$

Based on these results, we may now turn to state the first proposition.

*Proposition 1:*

Assuming the commitment is honored always, there exists a price  $p^*$  for which the socially optimal level of reliance  $x^*$  maximizes the buyer's payoff. That is, there exists a price for which:

$$x^* = \arg \max_x \left[ \int_0^{v+r(x)-\frac{v+r(x)-p^*}{\theta}} \theta(v+r(x)-c)f(c)dc + \int_{v+r(x)-\frac{v+r(x)-p^*}{\theta}}^{\bar{c}} (v+r(x)-p^*)f(c)dc - x \right]$$

*Proof:*

The proof proceeds by initially showing that there exists some “low” price for which the corresponding investment level exceeds  $x^*$ , and there exists a “high” price for which investment is lower than  $x^*$ . It is then observed that, as a rise in price diminishes reliance in a continuous fashion, an “intermediate” price level must exist for which the socially optimal investment obtains.

Initially consider the price  $\underline{p} = 0$ . Under  $\underline{p}$ , it is always beneficial for the buyer to hold the seller to her commitment, as  $v + r(x) - p \geq \theta(v + r(x) - c)$  for all  $c$ . As renegotiation thus never occurs in equilibrium, she chooses her investment level to satisfy  $r'(x) = 1$ . Let us denote that level by  $\tilde{x}$ . Since  $F(v + r(x^*))r'(x^*) = 1$  (see equation (4)), it follows that  $\tilde{x} \geq x^*$ .

It therefore remains to be shown that there exists a high price for which the chosen level of investment is lower than  $x^*$ . Consider the price  $\bar{p} = v + r(\tilde{x})$ . It is straightforward that under  $\bar{p}$ , the buyer simply ignores the commitment and chooses to invest  $\bar{x} \leq x^*$ , just as if no commitment were extended at all. The intuitive reason is that regardless of the buyer’s share of the marginal return, and regardless of the probability of efficient trade, she never wishes to invest more than  $\tilde{x}$ , and hence her ultimate valuation can never reach  $v + r(\tilde{x})$ . As  $\bar{p}$  is the upper bound of the buyer’s valuation, the seller’s commitment to transact at price  $\bar{p}$  is equivalent to no commitment at all. The buyer can do no better than to disregard the commitment altogether and choose the investment level of  $\bar{x} < x^*$ .

Formally, this observation can be demonstrated by showing that under  $\bar{p}$  there exists no solution to (10) in which  $v + r(x) \leq p$ . To see this, denote by  $\hat{x}$  the level of reliance induced by  $\bar{p}$ . Under condition (10),  $\hat{x}$  must satisfy:

$$[\theta F(\cdot) + 1 - F(\cdot)]r'(\hat{x}) = 1.$$

As  $[\theta F(\cdot) + 1 - F(\cdot)]$  can never exceed 1, and as  $\tilde{x}$  is defined as the value of  $x$  for which  $r'(x) = 1$ , it follows that  $\hat{x}$  can never surpass  $\tilde{x}$ . But if  $\hat{x} \leq \tilde{x}$ , then it must also hold that  $v + r(\hat{x}) \leq v + r(\tilde{x})$ . In other words,  $\bar{p} = v + r(\tilde{x})$  always exceeds the buyer's valuation. As the buyer can thus never benefit by contracting at the price of  $\bar{p}$ , she is best off disregarding the commitment and investing as if no commitment has ever been made. She thus chooses  $\bar{x} \leq x^*$ .

We have therefore seen that generous commitments such as  $\underline{p}$  yield over-investment, whereas miserly ones such as  $\bar{p}$  yield under-investment. Since the buyer's privately optimal investment is continuous with respect to the commitment price, it follows that there must exist a price  $p^* \in [\underline{p}, \bar{p}]$  for which the corresponding level of  $x$  is  $x^*$ .  $\square$

Recall that the analysis so far has been premised on the assumption that the seller never breaks her commitment. Let us therefore broaden the ambit of the discussion to allow for the possibility of breach.

I consider the effect of two alternative rules to govern the legal consequences of a seller's decision to break her commitment. Under the rule of expectation damages, the breaching seller must pay the buyer a sum equal to  $v + r(x) - p$  - the value that the buyer would obtain if the commitment were kept. Alternatively, under the rule of reliance damages, the breaching party would be merely liable for  $x$ , the cost that the buyer had spent in reliance.

It is a familiar result in the law-and-economics literature that, regardless of the promised price, the remedy of expectation damages induces an efficient decision of performance or breach, whereas the remedy of reliance damages generates an excessive tendency to breach.<sup>27</sup> As shown below, that result is retained in the present context. However, another important result emanating from the standard analysis is that both remedies induce excessive reliance.<sup>28</sup> This result no longer obtains in the present framework, and, in fact, it is shown that the buyer's level of investment under both measures is socially optimal. The intuitive reason is that the

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<sup>27</sup> See Steven Shavell, *Damage Measures for Breach of Contract*, 11 Bell J. Econ. 466 (1980); William Rogerson, "Contractual Solutions to the Holdup Problem," 59 Rev. Econ. Stud., 774 (1992);

<sup>28</sup> *Ibid.*

commitment, in the present context, does not bind both parties, as in the standard analysis. Rather, it allows its recipient to choose between a contract governed by the terms stipulated in the commitment, and a different contract, whose terms would be negotiated ex post. As the latter option may well lie within the equilibrium path, the tendency to over-invest is here balanced out by a tendency to under-invest, produced by the possibility of holdup. Thus, interestingly, the one-sided commitment, which binds the seller only, produces greater welfare than a standard contractual commitment, which would binds both.

Propositions 2 and 3 next establish these observations for the expectation and reliance measures respectively.

*Proposition 2:*

Suppose that seller extends a commitment stipulating a price of  $p^*$ , and that if she chooses to break the commitment, she must pay the buyer  $v + r(x) - p$ . Under this rule, trade and investment are both efficient.

*Proof*

It is first shown that the commitment is kept if and only if trade is efficient. First suppose that trade is indeed efficient, so that  $c \leq v + r(x)$ , and consider the seller's incentive to honor the commitment. If she breaches it, she can presumably charge a higher price in renegotiations. Denoting that benefit by  $\Delta^{BR}$ , we have

$$\Delta^{BR} = (1 - \theta)(v + r(x) - c) - (p - c) \quad (11)$$

However, breaching the commitment also triggers liability. Moreover, it is easily verified that the damage payment of  $v + r(x) - p$  always exceeds  $\Delta^{BR}$ . The seller, therefore, is induced to keep her commitment whenever  $c \leq v + r(x)$ .

Conversely, suppose that trade is inefficient. As  $c \geq v+r(x) > p$ , the breaking of the promise allows the seller to benefit the positive amount of  $c-p$ . Moreover, deducting  $p$  on both sides reveals that the benefit of  $c-p$  always exceeds the cost of  $v+r(x)-p$ . Hence, the seller always breaks the commitment when trade is inefficient.

Let us now turn to examine the buyer's incentive to invest under the expectation measure. Observe that if the buyer wishes to contract at the price of  $p$ , then her payoff is  $v+r(x)-p-x$  *regardless* of whether the seller chooses to keep her commitment, or rather to break it and pay damages. As the buyer's surplus is the same in both two scenarios, and in particular, the return for reliance is the same, her investment decision is not affected by the prospect of breach. Hence, the reasoning of Proposition 1 carries over to this case as well.  $\square$

*Proposition 3:*

Suppose that the seller can extend a commitment specifying a price  $p$ , and that if she breaks the commitment, she must the buyer her reliance cost of  $x$ . Then there exists a commitment price  $p^{**}$  which would induce the buyer to select the reliance level of  $x^*$ . This remains true notwithstanding the fact that the seller may break the commitment even when trade is efficient.

*Proof:*

As in the case of expectation damages, the buyer wishes to hold the seller to her commitment if and only if:

$$\theta(v+r(x)-c) > v+r(x)-p, \quad (12)$$

which can be rewritten as:

$$c < \frac{p-(1-\theta)(v+r(x))}{\theta}. \quad (13)$$



It is next shown, however, that the seller does not always keep her commitment, even in some states where trade is mutually desirable. To see this, note that under the examined rule, the seller holds the prerogative of paying reliance damages in lieu of honoring her commitment. She exercises that prerogative if the price she can charge in renegotiations exceeds the commitment price by a sum larger than the cost of reliance. Hence, the commitment is broken if and only if:

$$(1-\theta)(v+r(x)-c)-(p-c) > x,$$

which can be rearranged as follows:

$$c \geq \frac{x+p-(1-\theta)(v+r(x))}{\theta}. \quad (14)$$

Further recall that we restrict attention to commitments generous enough to affect the buyer's reliance, so that  $v+r(x)-x-p > 0$ . Rearranging again, this conditions can be written as:

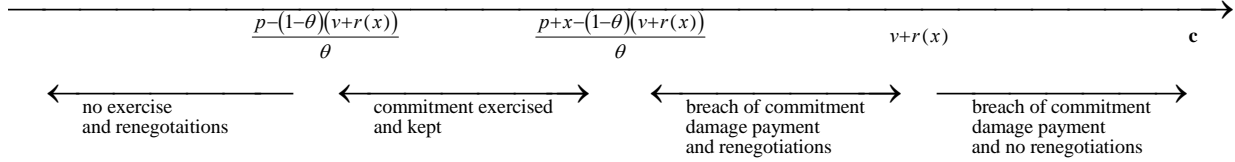
$$v+r(x) > \frac{x+p-(1-\theta)(v+r(x))}{\theta}. \quad (15)$$

It follows from the combination of (14) and (15), and the continuity of  $c$ , that whenever the exercise of the commitment generates some value to the buyer, then some cost values may exist for which:

$$v+r(x) > c \geq \frac{x+p-(1-\theta)(v+r(x))}{\theta}. \quad (16)$$

However, (16) then implies that the commitment may be broken although trade is efficient. Within that range, therefore, optimal trade requires renegotiation.

The following figure recapitulates the results obtained thus far:



When the realized cost is sufficiently low, renegotiations yield a lower price than the commitment price, and hence the commitments is not exercised (condition (13)); when the cost is somewhat higher, it is exercised and kept (conditions (13) and (14)); if the cost is elevated further, the seller is better off breaking the commitment and renegotiating a new contract, despite the cost of liability (condition (14)); and finally, when the cost is so high as to render trade inefficient ex post, the commitment is always broken, the seller bears liability, and trade ultimately does not occur.

It remains to be shown that, within this setting, there exists a commitment price that would induce the buyer to choose the socially optimal level of investment. The proof follows a similar argument to that presented in the proof to Proposition 1. Consider first a low commitment price of  $\underline{p}' = (1 - \theta)[v + r(\bar{x})]$ . Under  $\underline{p}'$  the buyer always prefers to exercise the commitment, as it always holds true that  $[\underline{p}' - (1 - \theta)(v + r(x))]/\theta \leq 0$  (see (13)). If the commitment is kept, reliance thus yields a marginal private return of  $r'(x) \geq 1$ . If, conversely, it is broken, then the buyer recoups her full investment cost through damage payments, and if renegotiations follow, then she captures an additional marginal benefit of  $\theta r'(x)$ . It follows that in some states of the world the buyer captures exactly a dollar for each marginal dollar invested, while in others she captures strictly more than a dollar. As established above, such returns lead to excessive investment (see (4)).

Alternatively, suppose that the commitment price is very high, and equals  $\bar{p}' \geq v + r(\tilde{x})$ . Once again, for similar reasoning as in Proposition 1, such a commitment has no effect on the buyer's investment incentive. The holdup problem therefore reemerges in full force and the chosen of level of reliance is lower than the social optimum.

Finally, the continuity of the buyer's optimal investment with respect to the commitment price ensures the existence of an intermediate price  $p^{**}$ , such that  $p^{**} \in [\underline{p}', \bar{p}']$  and the corresponding level of  $x$  is  $x^*$ .  $\square$

It has so far been shown in propositions 1 through 3 that there exists a commitment the seller could extend which would generate optimal results. It still remains to be shown, however, that the optimal commitment would indeed be extended. This task is taken up next in Proposition 4.

*Proposition 4:*

If the buyer can pay for the commitment before the seller's cost is realized, then the optimal commitment will be extended.

*Proof:*

Suppose, by contradiction to the statement of the proposition, that the seller would find it desirable to commit to some price  $\hat{p} > p^*$ .  $\hat{p}$  could be interpreted either as a modest commitment, or to no commitment at all, which would, accordingly, generate an investment level of  $\hat{x} < x^*$ . Observe that the move from  $\hat{p}$  to  $p^*$  would then unambiguously increase the buyer's expected gain and decreases the seller's. As investment is socially non-optimal, however, it follows that the buyer's gain will exceed the seller's loss. Thus, a move to the optimal commitment, alongside a transfer from the buyer to the seller, would create a Pareto improvement. If, conversely,  $\hat{p} < p^*$ , analogous reasoning applies. It therefore follows that the parties share a mutual interest in the provision of the optimal commitment price  $p^*$ .  $\square$

## V. Concluding Remarks

The discourse concerning the desirable legal regulation of the precontractual process, often revolves around two primary, contradictory intuitions. One common intuition is that the precontractual process, by definition, is not yet a contract, and hence should not entail a legal obligation, at least if the function of legal enforcement is taken to serve the parties' mutual purpose and intent. If and when the parties do wish to become bound, the law offers them a highly sophisticated framework by which to do so – the framework of contract itself. But if they knowingly engage in communication that is extra-contractual, then one is inclined to conclude that legal obligation was never intended.

The competing intuition is that a commitment, once it is made, is intended to serve the mutual interest of both the promisor and the promisee. If it did not benefit the promisor, then she would not voluntarily commit; and if it would not benefit the promisee, then she would not react. That presumption holds regardless of whether the setting in which the commitment is made is legally considered contractual or otherwise. If one does not wish to be bound, let her refrain from engaging in the commitment; but if a commitment is undertaken, then let it serve its mutually beneficial purpose. Of course, commitments can only achieve their desired ends if they are credible. The function of the law is thus to provide the necessary means to make them so.

In the conflict between these two prevailing intuitions, this paper provides support primarily for the latter. It shows that precontractual commitments can resolve a significant problem adversely affecting the process of negotiation. It shows that such commitments allow the parties to agree on the character of the negotiation process itself, and to thereby mitigate its various perils, arising from uncertainty and self-serving incentives.

It has been shown that both the expectation and the reliance measures may serve as a desirable means of enforcement, although in different circumstances. While both ultimately produce optimal reliance and optimal trade, reliance damages may be easier for courts to verify. Expectation damages, on the other hand, may sometimes lessen the likelihood of renegotiations, and thereby save on transaction costs. Either way, it is vital that the parties know which remedy would ultimately govern. The results of the analysis are consistent with actual doctrine in the sense that the two damage measures are indeed those that are commonly used in practice. However, the prescriptive conclusion is that the doctrinal rule should be steered towards a clearer choice between the two alternatives. The parties must know what legal remedy follows

from breach of a commitment. If the legal result remains obscure, then the desirable effects of commitments and their enforcement might be substantially encumbered.