

# **Anti-Insurance**

by

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Draft October 19, 2001

## **Abstract**

In standard models of contracts, efficient incentives require the promisor to pay damages for non-performance and the promisee to receive *no* damages. To give efficient incentives to both parties, we propose a novel contract requiring the promisor to pay damages for nonperformance to a third party, not to the promisee. In exchange for the right to damages, the third party pays the promisor and promisee in advance before performance or nonperformance occurs. We call this novel contract "anti-insurance" because it strengthens incentives by magnifying risk, whereas insurance erodes incentives by spreading risk. Anti-insurance is based on the general principle that efficient incentives typically require each party to bear the full risk that they jointly create. By improving incentives, anti-insurance contracts can create value and benefit everyone. Anti-insurance could be especially useful in contracts for goods susceptible to consumer misuse (e.g. automobile transmissions) and goods or service contracts requiring buyer's cooperation (e.g. building construction). In some circumstances we recommend allowing sellers to substitute anti-insurance for implied warranties or liability to consumers of defective products.

## Anti-insurance

Robert Cooter and Ariel Porat\*

Contracts pose a dilemma for incentives. For *unenforceable* promises, contract law does not require the promisor to pay damages for non-performance. Without liability, the promisor has an incentive to exert too little effort to perform. For *enforceable* promises, contract law requires the promisor to pay damages for nonperformance to the promisee. With damages, the promisee has an incentive to rely too much and to assist the promisor too little. Liability for less than 100% of the harm caused by non-performance erodes promisor's incentives and liability for more than 0% erodes promisee's incentives.<sup>1</sup>

This dilemma can defeat exchange, as in the following example:

Example 1: Warranty for Transmission on Used Car. Seller undertakes to repair the manual transmission of a used car before selling it to Buyer. Buyer fears that Seller will not supply a good transmission unless compelled by a warranty. So Buyer asks Seller to promise that the transmission will work for one year. Transmission failure within one year would breach the contract and cause the Seller to pay damages. However, Seller fears that Buyer might abuse a warranted transmission, so Seller offers a warranty for only three months. To allay Seller's fears, Buyer proposes that his abuse of the transmission should void the warranty. Seller rejects this proposal because he could not prove Buyer's abuse in court. The parties stop negotiating and no sale occurs.

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<sup>1</sup> Robert Cooter, "Unity in Tort, Contract, and Property" 73 *Cal. L. Rev.* 1, 3-4 (1985).

When several actors affect a risk, efficient incentives require each of them to bear the *full risk*. Specifically, when promisor and promisee affect the probability of non-performance or the magnitude of the resulting loss, efficient incentives require each of them to bear 100% of the resulting harm. The standard devices of contract law do not produce this result and cannot provide efficient incentives to both parties. To solve this dilemma, we propose a novel contract requiring the promisor to pay damages to a third party, instead of the promisee, in the event of non-performance.<sup>2</sup> Liability to the third party gives the promisor efficient incentives to perform. No damages for the promisee give her efficient incentives to restrain reliance and assist performance.<sup>3</sup> In exchange for the right to damages, the third party pays the others in advance before performance or nonperformance occurs.

We illustrate this novel contract, which we call “anti-insurance,” by application to Example 1. Assume that Third Party purchases Buyer’s right to damages from Seller for transmission failure. Third Party pays in advance for this assignment of the liability right,

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<sup>2</sup> For a contract allowing a third party to collect damages in case of a breach, see *St. Joseph's Association v. Magnier* (1861) 16 La. Ann. 338. In that case hatters agreed to close stores on Sunday, and stipulated that any hatter violating the agreement should pay a fine of \$100 to the asylum of the St. Joseph's Orphans. The asylum brought a suit against the defendant to recover the stipulated fine, arguing that he opened his store on several Sundays. The court dismissed the suit, saying, "It is a strained and unnatural construction to say that the contract was entered into with the view of making a donation to the plaintiffs". (We thank Melvin Eisenberg for this example.)

In the diamond industry, arbitrators may sometimes impose sanctions on the party in breach involving not only compensation to the aggrieved party but also a donation to charity. Lisa Bernstein, "Opting out the Legal System: Extralegal Contractual Relations in the Diamond Industry" 21 *J. Leg. Stud.* 115, 134-5 (1992).

For a suggestion that under certain circumstances large liquidated damages would be paid to a third party instead of the aggrieved party, see Charles R. Knoeber “An Alternative Mechanism to Assure Contractual Reliability” 12 *J. Legal Stud.* 333 (1983).

<sup>3</sup> Sometimes non-legal sanctions create the same incentives. See Robert Cooter & Ariel Porat, "Should Court Decuct Non-legal Sanction from Damages?" 30 *J. Leg. Stud.* 401 (2001); Ariel Porat, "Enforcing Contracts in Dysfunctional Legal Systems: The Close Relationship Between Public and Private Orders" 98 *Mich. L. Rev.* 2459 (2000).

before anyone knows whether or not the transmission will fail. If the transmission fails, Seller must pay damages to Third Party, and this fact gives Buyer confidence that Seller will supply a good transmission. If the transmission fails, Buyer will not receive any compensation, and this fact gives Seller confidence that Buyer will not abuse the transmission. By improving incentives, anti-insurance increases the value of the underlying transaction. Later we provide a numerical example in which anti-insurance benefits all three parties.

In the usual insurance contract, the insurer assumes the insured's risk, thus eroding the insured's incentives to reduce the risk. For example, when an insurance company assumes the car owner's risk of theft, the owner has less incentive to prevent theft. Anti-insurance inverts the usual insurance contract. In an anti-insurance contract, the anti-insurer increases the anti-insured's risk, thus strengthening the anti-insured's incentive to reduce the risk. To illustrate, anti-insurance increases the promisee's risk of loss from promisor's non-performance. In general, insurance erodes incentives by spreading risk and anti-insurance strengthens incentives by magnifying risk.

By imposing the full cost of a risk on everyone who affects it, anti-insurance causes everyone to internalize the risk. When everyone internalizes a risk, each one must balance the benefits and costs of the acts that affect it. Anti-insurance indirectly controls the acts that affect a risk by internalizing its cost. An alternative approach directly controls the acts that affect a risk, especially through contracts. To illustrate direct control in Example 1, Buyer could promise to keep the gears lubricated, not to shift gears roughly, not to accelerate too fast, etc. Seller, however, probably cannot observe and verify Buyer's breach of these promises. In contrast, the anti-insurer can probably observe and verify transmission failure relatively easily. Consequently, contracting for the acts that affect transmission in Example 1 has more practical obstacles than anti-insurance. In general, internalizing a joint risk often has lower transaction costs than contracting to control all the acts that significantly affect it.<sup>4</sup>

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<sup>4</sup> Robert Cooter, "Prices and Sanctions" 84 *Colum. L. Rev.* 1523 (1984).

Insurance markets suffer from imperfections, especially those caused by asymmetrical information. To illustrate, the insurer must predict the probability of a claim in order to set the premium. When insureds know more about the probability of a claim than insurers, adverse selection occurs. Specifically, many people with a high probability of a claim seek insurance, which causes the premium to rise, and some people with a low probability of a claim respond to the rise in premiums by dropping their insurance, which causes another rise in premiums, and so forth. Anti-insurance is vulnerable to an analogous imperfection. To illustrate, the anti-insurer of a contract must predict the probability of non-performance in order to price the promisee's liability right. Problems analogous to adverse selection arise when promisees or promisors know more about the probability of non-performance than anti-insurers.

To illustrate another imperfection, the insured often assigns her liability right to the insurer. Assignment undermines the insured's incentives to help the insurer assert the claim against an injurer. Here is the equivalent imperfection in anti-insurance: Promisee assigns her liability right to the anti-insurer, which undermines promisee's incentives to help the anti-insurer assert the claim against the promisor. Insurance markets found ways to reduce imperfections and flourish. Perhaps anti-insurance will eventually do the same.

Part I use a numerical example to illustrate anti-insurance. Part II explains some general propositions proved in the Mathematical Appendix. Part III discusses the factors determining the scope of anti-insurance. Part IV provides more examples. Part V extends the application of anti-insurance from risky losses to risky gains, and Part VI explains how to recast anti-insurance for losses into anti-insurance for gains, or vice versa. Part VII discusses the advantages of anti-insurance over other legal devices. In Part VIII we will speculate on some possible applications of anti-insurance. We believe that promising market applications of anti-insurance include goods susceptible to consumer misuse (e.g. automobile transmissions), and goods or service contracts requiring buyer's cooperation (e.g. building construction). Promising legal applications include allowing sellers to substitute anti-insurance for implied warranties in some consumer transactions, and

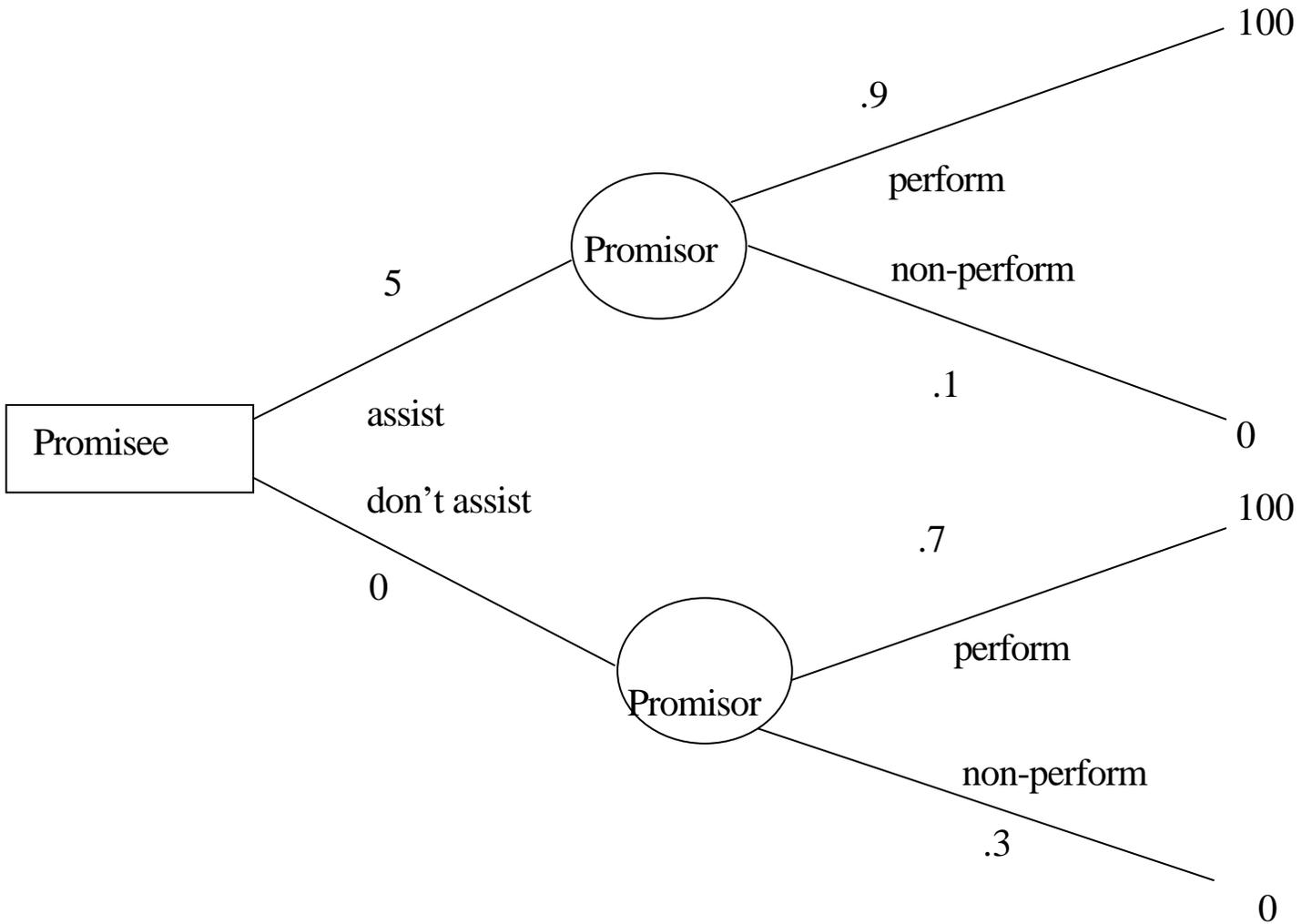
allowing manufacturers to substitute anti-insurance for strict product liability in some circumstances.

### **I. Numerical Example**

We will use a numerical example to show how anti-insurance works. Assume the promisee pays the promisor for a promise whose performance creates 100 in value for the promisee. In the event of nonperformance, the contract requires the promisor to pay expectation damages to the promisee, which equal 100. We assume that nonperformance causes no other losses to anyone. Expectation damages, consequently, create efficient incentives for the promisor by making him internalize the social costs of non-performance

We will focus on the promisee's incentives. Having made the contract, the promisee either assists or does not assist performance, as depicted in Figure 1. Assume that promisee's assistance costs 5 and increases the probability of performance from .7 to .9. The expected net gain from promisee's assistance equals  $-5 + (.9 - .7)100 = 15$ . By assisting the promisor, the promisee can create expected value of 15, so efficiency requires the promisee to assist the promisor.

**Figure 1: Assistance and Performance**

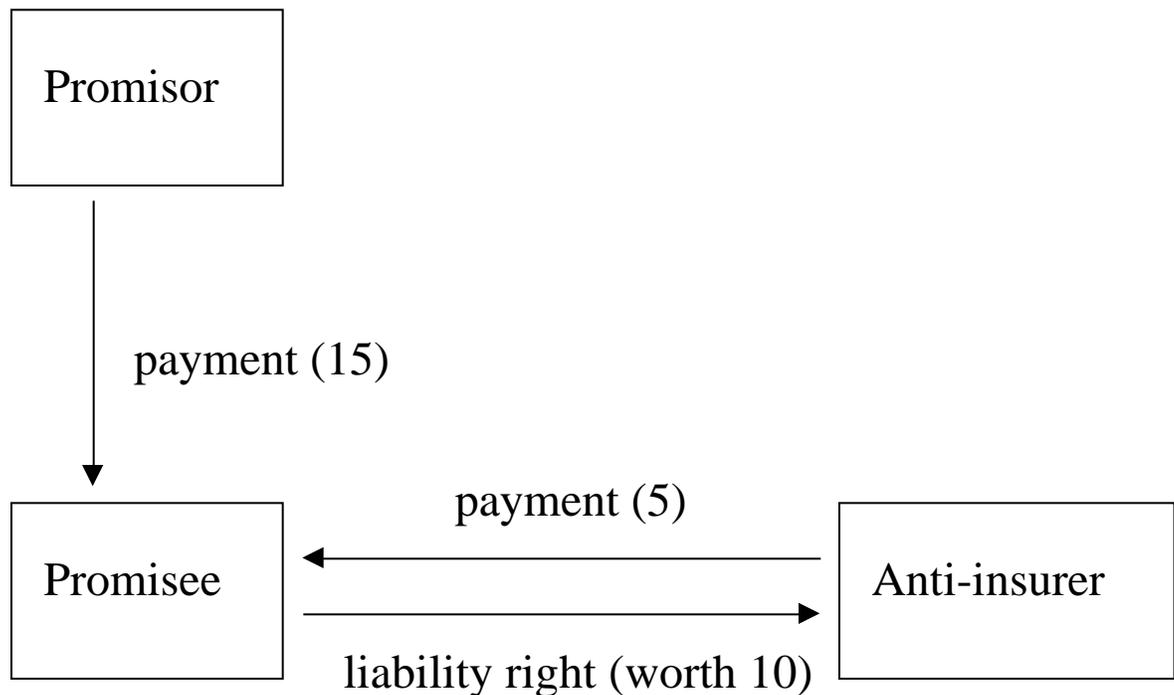


The contract, however, does not create incentives for the promisee to assist the promisor. The promisee receives 100 from performance of the contract and 100 in damages from nonperformance of the contract. Consequently, the promisee gains nothing from spending 5 to assist the promisor. To solve the problem directly, the promisee could promise to assist the promisor. We assume, however, that legal enforcement of a promise

to assist is ineffective because promisee's assistance is unobservable by the promisor and unverifiable in court. Thus a direct solution is impractical.

Anti-insurance solves the incentive problem indirectly. Before the events depicted in Figure 1 occur, the promisor and the promisee contract with the anti-insurer. Figure 2 depicts the anti-insurance contract. Now we describe its form, and later we derive the numbers shown in parenthesis. In the anti-insurance contract, the promisee assigns her right to receive damages in case of nonperformance to an anti-insurer (worth 10). In order to induce the promisee to assign her valuable liability right, the anti-insurer pays the promisee (5), and the promisor, who stands to gain (20) from the promisee's assistance, also pays the promisee (15).

Figure 2: Anti-insurance



Anti-insurance creates a surplus by facilitating cooperation. Economic theory offers no compelling prediction about dividing a cooperative surplus. The Nash bargaining solution, however, offers a rule of thumb for prediction and a guide to reasonable behavior. We will use Table 1 to depict the Nash bargaining solution to the anti-insurance contract in Figure 2. The Nash bargaining solution requires each party to receive his threat value plus an equal share of the surplus from cooperation. In the case of the promise depicted in Figure 1, the “threat values” refer to the payoffs that the parties expect to receive when the promisee does not assist the promisor, which Table 1 depicts in Column 2. Without the promisee’s assistance, the promisor breaches with probability .3 and pays 100 in damages, resulting in an expected payment of 30 as shown in Column 2. Because the promise is a binding contract, the promisee receives 100 regardless of whether the promisor performs or breaches, as shown in Column 2.

Now we turn from non-cooperation to cooperation. Recall that assisting the promisor costs the promisee 5 and increases the probability of performance from .7 to .9, resulting in an expected net gain equal to  $-5+(.9-.7)100=15$ . Cooperation creates a surplus of 15, and anti-insurance is the vehicle that enables cooperation. If the promisor, promisee, and anti-insurer bargain and agree on terms as specified by the Nash bargaining solution, then each one receives his threat value plus an equal share of the surplus from cooperation. Column 3 depicts the Nash bargaining solution, in which each player receives his payoff in Column 2 plus 1/3 of the surplus of 15. Reasonable bargaining for anti-insurance would yield the outcomes in Column 3.

**Table 1: Bargain for Anti-Insurance**

Column 1 parties	Column 2 expected payoff without promisee's assistance	Column 3 Nash bargaining solution	Column 4 anti-insurance
promisor	.3(-100)	-25	-15-.1(100)
promisee	100	105	15+5-5+.9(100)
anti-insurer	0	5	-5+.1(100)
total	70	85	85

To implement the Nash bargaining solution, the anti-insurance contract requires the payments depicted in Column 4 of Table 1 (which correspond to the numbers in parenthesis in Figure 2). According to Column 4, the promisor pays 15 to the promisee under the anti-insurance contract. In addition, the promisor expects to pay damages of 100 with probability .1 to the anti-insurer. So the promisor's net payoff equals -25. The promisee receives 15 from the promisor and 5 from the anti-insurer. The promisee also spends 5 assisting the promisor. Having assigned her liability right to the anti-insurer, the promisee receives 100 with probability .9 from performance of the contract and 0 with probability .1 from nonperformance. So the promisee's net payoff equals 105. The anti-insurer pays 5 to the promisee and receives a liability right that pays 100 with probability .1, so anti-insurer's net payoff equals 5.

Table 1 assumes that the anti-insurer, promisor, and promisee have equal bargaining power. If the anti-insurance market were perfectly competitive, however, the anti-insurer would lack bargaining power. Assuming that perfect competition deprives the anti-insurer of bargaining power, promisor and promisee in the numerical example will divide the profits that otherwise go to the anti-insurer. To depict perfect competition for anti-insurance, modify Table 1 by taking 5 away from the anti-insurer in Column 3 and dividing it between the promisor and promisee, so that they receive net payoffs of -22.5 and 107.5, respectively.

Table 1 implicitly assumes that transactions costs of anti-insurance are zero. We can modify Table 1 to encompass positive transaction costs. To illustrate, assume that the perfectly competitive anti-insurer has transaction costs of 2, so anti-insurance creates a net surplus of 13. Assuming that perfect competition deprives the anti-insurer of bargaining power, the promisor and promisee enjoy the net surplus of 13. Consequently, Table 1 should be modified so that the net payoffs of the promisor and promisee equal -23.5 and 106.5, respectively.

## II. Propositions – Anti-insurance v. Controls

Now we turn to the generalizations underlying this example. Several acts by different actors typically affect the probability and extent of a risk. We distinguish these acts into two types by their legal consequences. An act is “controlled” if it affects a legal sanction by law or contract. To illustrate, breach of a contract triggers a legal sanction. In contrast, legally “uncontrolled” acts do not affect a legal sanction by law or contract. To illustrate by our numerical example, the promisee’s failure to assist the promisor is legally uncontrolled.

The distinction between controlled and uncontrolled acts relates to two ways that contracts can affect risk. The first alternative is to control the acts that affect the risk by a stipulation in the contract. To illustrate by Example 1, the risk of transmission failure increases when Buyer drives the car farther. The number of miles driven is easily read off the speedometer. So seller might warrant the transmission for 10,000 miles. This warranty helps to control how far Buyer drives. Seller, however, cannot easily observe and verify Buyer’s hard driving, such as shifting gears quickly and accelerating fast, so these acts are not controllable by law or contract.<sup>5</sup>

The second alternative is to make the actors who significantly affect a risk internalize its social cost. Internalization, which implies that each actor pays 100% of the

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<sup>5</sup> Models of accidents usually assume that negligence law can control precaution but not activity level. Notice, however, that a private contract can control the activity level in Example 1 more easily than the precaution of the parties.

social cost of the risk, creates efficient incentives for all the acts that affect a risk, regardless of whether they are controlled or uncontrolled. Anti-insurance is the contractual device to make several actors internalize the social cost of a risk affected by each of them. To illustrate by Example 1, anti-insurance provides Buyer with efficient incentives for every act that affects the transmission, including not driving too far, shifting gears smoothly, accelerating moderately, and keeping the gears greased.

The appendix proves some propositions that help to compare these two alternatives. The first proposition expresses a familiar tautology about the meaning of “internalization.”

Proposition 1: Internalization of a risk by actors gives them efficient incentives for all the acts that affect it.

Instead of internalizing risk, the actors who affect a risk often share its cost. Risks are shared by definition when they sum to 100%. Examples of sharing rules include liability of injurer to victim for the full harm, liability for part of the harm, and liability for none of the harm. In the presence of uncontrolled acts by the parties that affect the risk, all of these rules are inefficient.

Proposition 2: Any rule for sharing risk among actors provides one or more of them with inefficient incentives to affect the risk.

Proposition 2 implies the inefficiency of the rules of no liability, strict liability, and shared liability. (Besides loss-sharing rules, Proposition 2 also implies the inefficiency of profit-sharing rules, as we explain later.)

To overcome the inefficiencies caused by sharing risk, a contract or law may try to control behavior. To create efficient incentives by controlling an actor who does not internalize a risk, every act that significantly affects the risk must be controlled. Some acts, however, are typically uncontrollable by contract or law because they are unobservable by the potential plaintiff or unverifiable in court. Consequently, controls typically cannot overcome the inefficient incentives created by a sharing rule. Thus some (but not all) acts affecting a risk are controlled by the rules of negligence, negligence with a

defense of contributory negligence, comparative negligence, and strict liability with a defense of contributory negligence. Proposition 2 implies the inefficiency of these rules.

Unlike controls, anti-insurance can overcome the inefficiencies of sharing rules. Anti-insurance must encompass all the people who significantly affect the risk in question. When risk sharing distorts incentives, anti-insurance corrects the distortion by imposing the full cost of the risk on everyone who significantly affects it.

Proposition 3: For any sharing rule, an anti-insurance contract can internalize the risk for the actors.

We can restate the relationship between controls and internalization in terms of transaction costs. Anti-insurance requires contracting among all the people who affect a risk, and observing and verifying the realization of the risk. Direct controls, in contrast, require contracting over all the acts of all the people that significantly affect the risk, and observing and verifying each of the acts of each of the people who affect the risk. Contracting over all the people who significantly affect a risk will often be cheaper than contracting over all the acts of all these people. Furthermore, incomplete controls imply distorted incentives for that affect the risk.

Proposition 4: To choose between anti insurance and direct controls, balance  
(a) the cost of observing and verifying the realization of the risk;  
(b) the cost of observing and verifying the acts that influence the risk;  
(c) the distortions created by direct controls due to uncontrollable acts.

### **III. Scope for Anti-Insurance: Variables**

We have explained the concept of anti-insurance and illustrated it numerically. Now we will list and discuss factors influencing the scope of its application.

*Observation and Verification Costs:* Proposition 4 compares controls and anti-insurance as different approaches to managing risk. Enforcing a contract to control the acts that affect a risk requires observing and verifying these acts. Enforcing an anti-insurance contract requires observing and verifying the realization of the risk. Anti-

insurance is especially attractive when the costs of observing and verifying the acts that affect the risk are high relative to the costs of observing and verifying the realized risk.

*Attitudes towards risk:* Most people are averse to risks involving a large proportion of their wealth, and they are not averse to risks involving a small proportion of their wealth. Consequently, insurance is attractive when people bear large risks relative to their wealth, and anti-insurance is attractive when people bear small risks relative to their wealth. To illustrate, anti-insurance is attractive in Example 1 because the cost of a transmission is small relative to the wealth of most car buyers

*Responsiveness to risk:* The promisee can often decrease the expected loss from non-performance of a contract by revealing information useful to the promisor, assisting the promisor's performance, avoiding over-reliance, and mitigating damages. The more victims respond to risk, the larger the loss from spreading risk by insurance and the larger the gain from magnifying risk by anti-insurance. To illustrate by Example 1, the more car buyers harm transmissions in response to a warranty, the more a warranty costs and larger the gain from substituting anti-insurance for warranties. Conversely, the less the promisee or victim responds to risk or can influence it, the lower the gain from magnifying risk by anti-insurance.

*Pricing costs:* The anti-insurer has to figure out how much to pay for liability rights. As with insurance, pricing a contingent commodity is a difficult institutional and actuarial problem. These costs typically fall with volume, so viable anti-insurance may require a large scale. In general, the need for a high volume of transactions to lower the costs per transaction presents an obstacle to the development of anti-insurance markets.

*Adverse selection:* In an anti-insurance contract, the anti-insurer bargains with the promisor and promisee to acquire the promisee's liability right. The value of the promisee's liability right presumably differs from one case to another. One party to the bargain often knows less than others about its value. The relatively uniformed party, who lacks knowledge of the particular case, may rely on the average value of liability rights in similar cases. In these circumstances, the owners of liability rights with above-average

value will tend to withhold them from sale, and the owners of liability rights with below-average value will tend to sell them. Thus the anti-insurance market suffers from the same selection against quality that occurs in markets for health insurance or used cars. For example, if the promisee and promisor know that the liability right is worth more than average, and if the anti-insurer does not know this, then the anti-insurer may offer the average price and the others may refuse to sell. The severity of the problem of adverse selection depends especially on the extent of the difference in information about liability rights among the parties.

*Victim's reporting problem.* If the promisee transfers his liability right to the anti-insurer, then the anti-insurer must know when breach occurs in order to know when to assert a claim. If the anti-insurer cannot observe non-performance, the anti-insurer may need to rely on promisee's report of harm to know when to assert a claim. The *victim's reporting problem* refers to the problem of inducing the promisee to report promisor's non-performance to the anti-insurer. To illustrate by Example 1, Anti-insurer needs Buyer to report transmission failures so that Anti-insurer can assert liability rights against Seller. Buyer whose transmission fails, however, gains nothing from disclosing this information to Anti-insurer.

To solve the victim's reporting problem, the anti-insurer may pay the promisee a fixed fee or a percentage of damages for making a report. These payments correspond to deductibles or co-insurance in standard insurance contracts. To illustrate by Example 1, Anti-insurer might pay Buyer to provide evidence of transmission failure. Alternatively, instead of anti-insurer paying promisee to report non-performance, the anti-insurance contract may require promisee to pay a penalty for failing to report non-performance.<sup>6</sup>

*Changed circumstances and renegotiations:* When circumstances change, the parties can sometimes benefit by renegotiating the contract. The renegotiated contract often allows the promisor to modify performance rather than performing as originally

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<sup>6</sup> A discussion of stipulated damages and limits on enforcing penalties is found in E. Allan Farnsworth, *Contracts* (3<sup>rd</sup> ed., 1999) 843-4.

promised. Both parties can benefit from renegotiations in changed circumstances. When the anti-insurer acquires the promisee's liability right, however, a modification of the promise affects the anti-insurer as well as the promisor and promisee. Anti-insurance can cause a dispute over whether or not performance of the renegotiated contract is performance of the original contract, in which case damages are not owed, or non-performance of the original contract, in which cases damages are owed. Given this fact, the promisor and promisee have an incentive to make unproductive modifications that avoid breach of the original contract. Conversely, the promisor and promisee have an incentive not to make productive modifications that might count as breaching the original contract.

In principle, negotiations with the anti-insurer can overcome these distorted incentives,<sup>7</sup> but a third party obviously complicates negotiations in practice. Consequently, stable circumstances favor anti-insurance. To illustrate by Example 1, automobiles are familiar, statistically predictable products, so the circumstances of their use seldom change in unforeseeable ways.

(Note that Anti-insurance does not suffer from the same recontracting problem that often arises in principal-agent models.<sup>8</sup>)

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<sup>7</sup> This is an application of the Coase Theorem.

<sup>8</sup> In the standard formulation, a risk-neutral principal puts an asset under the control of a risk-averse agent whose non-contractible effort creates value. For example, *see* S. Shavell "Risk Sharing and Incentives in the Principal and Agent Relationship" 10 *Bell Journal of Economics and Management* 55 (1979). Agency models typically assume that events occur in this sequence: the principal and agent contract, the principal puts the asset under the agent's control, the agent acts, nature resolves the risk, and the parties distribute the gains or losses according to their contract. The efficient contract requires the principal, who is relatively risk neutral compared to the agent, to assume much of the risk. However, the efficient contract stops short of removing all of the agent's risk in order to provide him with incentives to act.

After the agent acts, however, the incentives have already done their work and they are no longer needed. Consequently, the parties have an incentive to recontract in order to transfer all the risk to the principal. If, however, the agent foresees recontracting, this knowledge will undermine the incentives in the original contract. This is the problem of recontracting in principal-agent models.

*Repeat transactions:* Long run relationships generally inhibit opportunistic behavior, which reduces the need for all contracts, including anti-insurance. Conversely, one-shot transactions increase the need for anti-insurance to improve victims' incentives. To illustrate by Example 1, high stakes and tentative relationships make used car sales notorious for opportunism. Impersonal trade on a wide scale thus favors anti-insurance.

*Collusion and Fraud:* Like most 3-party contracts, anti insurance is susceptible to cheating when 2 parties collude against the 3<sup>rd</sup> party. Three possibilities exist.

--First, collusion between promisor and promisee. The promisor has an incentive to breach the anti insurance contract and to pay the promisee not to report the harm. To illustrate by Example 1, Seller might offer to pay Buyer half the cost of repairing a broken transmission in exchange for not disclosing the transmission's failure to Anti-insurer. Seller and Buyer both benefit at the expense of Anti-insurer. Similarly, another way that promisor might reduce the value of the liability right owned by the anti-insurer is secretly to pay promisee to assist performance. To illustrate by Example 1, Seller might offer to pay Buyer to drive fewer miles than planned. Collusion between promisor and promisee generally deprives anti-insurer of the value of the liability right.

--Second, collusion between promisee and anti-insurer. The anti-insurer may pay the promisee to reduce precautions and assistance, thus increasing the value of the liability right. To illustrate by Example 1, the Anti-insurer might subsidize Buyer's participation in drag races. Or the anti-insurer and the promisee may secretly agree to divide between themselves the damages that the anti-insurer will collect from the promisor.<sup>9</sup> Collusion between promisee and anti-insurer generally deprives the promisor

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See S. Grossman & O. Hart, "An Analysis of the Principal-Agent Problem" 51 *Econometrica* 7 (1983).

Our model of anti-insurance, however, has a different structure involving three parties rather than two. The anti-insurance model does not require an assumption of risk aversion. In its simplest form, the anti-insurance model assumes risk neutrality. So the problem or recontracting is quite different in the two models.

<sup>9</sup> To illustrate by Example 1, the anti-insurance contract signed by Buyer, Seller, and Anti-insurer may stipulate that Anti-insurer will give Buyer 10% of the value of any reported claim. The Anti-

of the advantages of strong incentives for the promisee to reduce the probability and cost of non-performance.

--Third, collusion between promisor and anti-insurer. The promisor might secretly pay the anti-insurer for a promise not to collect damages in case of harm to the promisee. To illustrate by Example 1, Anti-insurer and Seller secretly agree that in case of transmission failure Seller will pay little or nothing to Anti-insurer. Consequently, Buyer buys the car under the mistaken belief that Seller has strong incentives to provide a good transmission. Collusion between promisor and anti-insurer generally deprives the promisee of the advantages of strong incentives for the promisor to reduce the risk of harm.

The same forces tend to prevent collusion in any of its forms. At a minimum, collusion between two parties breaches the anti-insurance contract. In addition, collusion may involve torts or crimes, so the collusive agreement is illegal and unenforceable. Collusion, consequently, requires trust between the parties. In most circumstances, distrust combines with other nonlegal mechanisms to prevent collusion.

To illustrate by Example 1, assume that Seller pays Buyer for the promise not to report the transmission failure to Anti-insurer. This contract is illegal, so Buyer's promise is unenforceable. Seller runs the risk that Buyer might ask Seller for a second payment in exchange for another promise not to report the transmission failure. Seller also runs the risk that Buyer will take the money and then negotiate a reward from Anti-insurer for reporting the transmission failure. Foreseeing these facts, Seller will not attempt to collude with Buyer unless Seller trusts Buyer.

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insurer gives Buyer 10% so Buyer has an incentive to report harm. In addition, a secret agreement between Buyer and Anti-insurer may stipulate that Buyer will pay anti-insurer and acquire a right to more of the value of the reported claim, say 50% of that claim. After acquiring this right from Anti-insurer, Buyer saves costs by reducing precaution and Seller's expected damages increase. If effective, the secret agreement decreases Buyer's incentives to care for the transmission, whereas Seller mistakenly supposes that Buyer has strong incentives for care.

Even if Seller trusts Buyer to keep his promise, other mechanisms may obstruct collusion. Unlike Buyer, Anti-insurer probably does repeat business with Seller. Consequently, Seller who colludes against Anti-insurer risks detection and destruction of a valuable business relationship. In addition, disclosure may ruin Seller's reputation and prevent contracts with other anti-insurers. Various disclosure mechanisms might increase this risk, such as requiring Seller to disclose his account books to Anti-insurer.

Parties can also reduce the risk of collusion by carefully choosing their business partners. To illustrate by Example 1, Buyer might reduce the risk of collusion between Seller and Anti-insurer by insisting that Anti-insurer should be a consumer organization or be certified by a consumer organization. Alternatively, Buyer might insist that Anti-Insurer should be a large corporation with a valuable reputation among consumers.

#### **IV. Anti-Insurance for Losses: Examples**

We have developed a general theory of anti-insurance. Much of the value of the theory resides in its application to particular examples, which is our next topic.

Example 2 is identical to Example 1, except that the car is new, not used.

Example 2: Warranty for Transmission on New Car—Manufacturer makes and sells new cars. As proof that transmission is well designed and made, Manufacturer promises that the transmission will work for one year. Transmission failure within one year obligates the Manufacturer to pay damages. Some buyers want Manufacturer to guarantee the transmission for three years, but Manufacturer knows that some buyers abuse a warranted transmission and abuse is not provable in court. To solve this problem, Manufacturer proposes a contract extending the liability right to three years and requiring Buyer to assign the liability right to Anti-Insurer, who offers to pay for the liability right.

The critical difference between used and new cars concerns individualized versus standardized quality. In Example 1, Seller repairs the transmission of the used car for an individual buyer, whereas in Example 2 Manufacturer supplies the same quality of transmission to all buyers. Consequently, Manufacturer has a strong incentive to provide high quality transmissions when many buyers have anti-insurance, but any single buyer's anti-insurance has little influence on Manufacturer. In Example 2, each buyer wants

everyone else to buy anti-insurance, but no individual buyer wants to buy anti-insurance. In general, each buyer of a new, mass-produced product wants to free ride on others' anti-insurance. Since all buyers benefit from everyone having anti-insurance and no individual buyer wants to pay for it, the manufacturer may include anti-insurance in the bundle of non-negotiable terms of sale.

Here is another example from a different kind of contract with the same advantages for anti-insurance as in Examples 1.

Example 3: At-will Employment Contract for Unverifiable Work - Employer offers Worker an employment contract for one year. The contract stipulates that Employer can fire worker for any reason or no reason after giving one month's notice. Worker fears that he will quit his present job in reliance on the new employment contract and then get fired from the new job.<sup>10</sup> To avoid this problem, Worker proposes to replace the "at will" clause with a "for cause" clause, which stipulates that Employer can only fire Worker for one of the causes enumerated in the contract such as insufficient effort at work. Employer refuses because "cause" is too hard to prove in court. Instead, Worker proposes retaining the "at will" clause and adding a clause stating that if Employer fires worker then Employer must pay damages to Anti-Insurer.

The motivation for anti-insurance in Example 3, as in Examples 1, is to induce good behavior by the victim when bad behavior is unprovable in court. An important difference in the examples, however, is transaction costs. Employment contracts are more individually tailored, so the transaction costs of anti-insurer will be higher for employment contracts than transmissions. Specifically, the anti-insurer will have more difficulty deciding how much to offer to pay for the victim's liability rights. If, however, Employer is a large company with many employees, the transaction costs may be low enough to make the anti-insurance contract benefit everyone.

Next we modify Example 3 to illustrate a problem with mitigation of damages after breach of contract.

Example 4: At-will Employment Contract When Efforts to Mitigate Damages are Unverifiable – Worker asks Employer for one year employment contract requiring Employer to pay damages for firing Worker without cause. Employer

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<sup>10</sup> Cf. *Grouse v. Group Health Plan, Inc.* 306 N.W. 2d 114 (Minn 1981). \_

refuses on grounds that fired worker may increase the damages by delaying acceptance of alternative employment. Worker makes a counter-proposal for Employer to pay damages for firing Worker to Anti-Insurer, not to Worker.

In this example, Employer fears that Worker will not mitigate in spite of a legal burden to mitigate.<sup>11</sup> Anti-insurance solves the problem by giving the Employer incentives not to fire the worker and also giving promisee incentives to mitigate damages.

Now we turn to an example that in which the promisee should assist performance and restrain reliance.

Example 5: Construction Contract – Promisee owns a restaurant that needs a larger facility. Promisor, who is a builder, promises to construct the new facility for occupancy on September 1. Promisee knows better than promisor how to induce recalcitrant city inspectors not to hold up construction. Promisee needs to order more food in advance for sale in the larger facility. To induce Promisee's assistance with the city inspectors and restraint in ordering food, Promisee assigns his liability rights for breach of contract to Anti-insurer. Anti-insurer pays in advance for the assignment of liability rights.

Notice that Promisor's behavior in Example 5 depends partly on promisee's behavior, and Promisee's behavior is unverifiable. Consequently, imposing a legal duty on Promisee to assist performance and restrain reliance is ineffective, regardless of whether its form is a term in the contract or a comparative negligence rule for breach of contract.<sup>12</sup>

## V. Anti-Insurance for Gains

We explained that when several actors affect a risk, efficient incentives require each of them to bear the *full risk*. So far we have applied this proposition to the risk of losses. Now we apply the proposition to risk of gains. When promisor and promisee affect the probability or magnitude of a gain, efficient incentives require each of them to

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<sup>11</sup> The burden of an employee to reasonably mitigate damages extends to the efforts of searching a new job, but not to the final decision whether to take the job. See *Shirley Maclaine Parker v. Twentieth Century-Fox Corp.* 474 P. 2d 689 (Cal. 1970).

<sup>12</sup> Some jurisdictions apply comparative negligence to warranties. See James J. White & Robert S. Summers, *Uniform Commercial Code* (5<sup>th</sup> ed., 2000) 410-3.

bear 100% of the resulting gain. To develop this idea, we apply it to the principal-agent relationship.

Example 6: Agency Contract – Principal and Agent need each other’s cooperation and effort to sell business computers. Agent must locate interested buyers, and Principal must negotiate and tailor the contract to the buyers’ needs. Total sales depend upon effort and luck. The current contract requires Principal to give 50% of profits from sales to Agent.<sup>13</sup> To have full incentives for effort by both parties, Agent must receive 100% of value created by a sale and Principal must also receive 100%. To achieve this goal, the parties buy anti-insurance. Principal and Agent pay Anti-insurer a fixed sum in advance of sales, and the Anti-insurer matches dollar for dollar the revenue from sales. By matching all profits with anti-insurance, the Principal and Agent each receive 100% of the value created by their joint efforts.

In this example, anti-insurance causes the Principal and Agent to internalize the entire profits from sales, so they work harder and expected profits increase. Because expected profits increase, they can pay the anti-insurer enough in advance so that everyone benefits.

Now we state the precise difference between anti-insurance for gains and losses. Anti-insurance for gains means that promisor and promisee pay anti-insurer a flat fee in advance for his promise to pay them an amount equal to any gain that they subsequently realize. Anti-insurance for losses means that the anti-insurer pays a flat fee in advance for the promise of the promisor and promisee to pay him an amount equal to any loss that they subsequently realize. Mixed cases also arise when realizations can be positive or negative.

Here is another example pertinent to legal practice.

Example 7: The Law Firms. Two law firms work together for the plaintiff on a bodily injury case. Firm A is responsible for proving liability and Firm B is responsible for establishing damages. If they both exert optimal effort and win the case, their joint gains will be 200, which they will split equally. If both of them exert optimal effort, the probability of winning 200 is .25. So, with optimal effort, each firm expects to win 25. Both firms realize that the other firm will not invest in the case more than *its* expected gain of 25. To maximize joint payoffs,

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<sup>13</sup> Cf. *Wood v. Lucy, Lady Duff-Gordon* 118 N.E. 214 (N.Y. 1917).

however, each firm should invest in the case as if its expected gain were the expected joint gain of 50. The problem is that each firm externalizes half of the benefit associated with its investment in the case. Both firms know that their behaviors are not observable or verifiable. To solve the problem, the two firms buy anti-insurance for gains. If they win the case, the anti-insurer adds 200 to the gain of 200, so *each* firm receives 200. In exchange for anti-insurance, the two firms pay the anti-insurer 50 in advance (assuming zero transaction cost).

In Example 7, anti-insurance for gains solves an incentive problem involving teamwork. Anti-insurance for gains is especially attractive in situations of cooperative ventures, when both parties' behavior is unobservable and unverifiable, and when the surplus of the two parties is dependent upon their cooperation.

The two law firms in Example 7 face essentially the same problem as the plaintiff and the plaintiff's lawyer in many liability cases, as illustrated by the next example.

*Example 8: Attorney-Client Relationship.* Success in a suit for damages requires attorney and client to put effort into winning the case. Attorney takes plaintiff's case on a contingent fee of 30%. Consequently, the plaintiff's attorney will balance his costs of working on the case against 30% of the judgment, and the plaintiff will balance his costs of working on the case against 70% of the judgment. To maximize their expected joint payoff, however, each of them should balance his costs against 100% of the judgment. Recognizing this fact, they enter into an anti-insurance contract. The anti-insurer promises to match the judgment dollar for dollar, so the plaintiff receives 100% of the judgment and the plaintiff's attorney also receives 100% of the judgment. In exchange, they pay the anti-insurer a flat fee at the beginning of the case. (Note that in perfect competition with zero transaction costs, the flat fee equals the expected judgment.)

Example 8 illustrates the fact that anti-insurance can completely solve the attorney-client problem that contingent fees partially solves.

Polinsky and Rubinfeld propose to solve the attorney-client problem by an alternative approach, which we briefly describe and compare to anti-insurance.<sup>14</sup> Anti-insurer aligns the interests of lawyer and client by raising the lawyer's payoff to the same

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<sup>14</sup> See A. Mitchell Polinsky & Daniel L. Rubinfeld, "Aligning the Interests of Lawyers and Clients" Stanford Law and Economics Olin Working Paper No. 223, August 2001. Presented at Berkeley Law and Economics Workshop, 24 Sept 2001.

fraction as his costs, specifically 100%. To illustrate, if the contingent fee is 30%, then anti-insurance solves the incentive problem for the plaintiff's attorney by adding an additional 70% to his payoff, so he balances 100% of the judgment against 100% of his cost. In contrast, Polinsky and Rubinfeld's "administrator," who plays the same role as the anti-insurer, aligns the lawyer's interest with the client's by reducing the lawyer's costs to the same fraction as the lawyer's contingency. To illustrate by the case of a 30% contingency, the "administrator" reimburses 70% of the attorney's costs, so he balances 30% of the judgment against 30% of his costs. Like the anti-insurer, the administrator receives an up-front payment of a flat fee from the parties. Market competition makes the whole thing work by aligning actual prices with underlying values.

These approaches differ in two main respects. First, the contract with the "administrator" controls one variable, whereas the anti-insurer contract makes the parties internalize the risk. Specifically, Polinsky and Rubinfeld's approach gets incentives right for hours worked by the attorney, but not other variables affecting the expected judgment, including attorney's effort and client's hours spent on the case. In contrast, anti-insurance gets incentives right for all acts by attorney or client that affect the expected judgment. Second, for the market to work, Polinsky and Rubinfeld's administrator must accurately predict the hours that the attorney will work on the case, whereas the anti-insurer must accurately predict the judgment. Thus the two approaches require observing and verifying different facts.

Will anti-insurance for gains actually work in the real world? Part II explains the variables that affect the feasibility of anti-insurance for losses. These same variables affect the feasibility of anti-insurance for gains. Instead of discussing all of them, we focus on the most important. In analyzing anti-insurance for losses, the victim's reporting problem formed a major obstacle. Recall the problem is that the victim may under-report his losses to the anti-insurer. An analogous problem arises with anti-insurance for gains. Here the problem is that the two cooperators may over-report their gains, so the anti-

insurer will pay them more than they are owed. This is the *beneficiary's reporting problem*.

Another problem is that anti-insurance for gains creates an incentive for the cooperators to make side payment to induce excessive exertion, which transfers wealth from the anti-insurer to themselves. To illustrate by Example 7, Firm A and Firm B expect to receive money from the trial judgment, which we call the “product,” and money from the anti-insurer, which we call the “transfer.” Being rationally self-interested, Firm A works until another \$1 worth of its exertion causes an increase of \$1 in its expected payoff. This exertion by A also causes an increase of \$1 in Firm B’s expected payoff. Half of the joint gain of \$2 comes from production and half comes from transfer. Since Firm A’s effort costs \$1 and produces \$1, Firm A’s effort is efficient. However, Firm B has an incentive to make a side payment to induce even more effort from Firm A. By doing so, Firm B can cause the anti-insurer to transfer more money to Firms B and A. Significant obstacles, however, may prevent side payments. First, the inability of each party to observe the other’s effort will also inhibit side payments for effort. Second, side payments between Firms A and B are a form of collusion that will violate the anti-insurance contract and possibly violate the law of torts and crimes. Collusion will trigger sanctions if detected, so collusion often requires more trust than the parties have in each other.

Another problem concerns pricing. With anti-insurance for losses, the anti-insurer has to figure out how much to pay the victim for the liability rights. With anti-insurance for gains, the anti-insurer has to figure out how much to charge the cooperators for giving them entitlements. Pricing anti-insurance is a difficult institutional and actuarial problem, regardless of whether anti-insurance covers losses or gains.

## **VI. Choosing Between Anti-Insurance for Gains and Losses**

Public finance economists recognize that taxes and subsidies can achieve identical incentive effects in principle, although they differ sharply in fact. The same is true of

anti-insurance for losses and gains. Recall that “anti-insurance for gains” means that promisor and promisee pay anti-insurer a flat fee in advance for his promise to pay them an amount equal to any gain that they subsequently realize. In contrast, “anti-insurance for losses” means that the anti-insurer pays a flat fee in advance for the promise of the promisor and promisee to pay him an amount equal to any loss that they subsequently realize. We prove the following equivalence theorem in the appendix:

**Proposition 5: Equivalence of Anti-insurance for Gains and Losses.** For each efficient anti-insurance contract for gains there corresponds an efficient anti-insurance contract for losses, and vice versa.

The explanation of Proposition 5 is straightforward. A risk has relatively good and bad realizations. For example, the promisor can perform or not perform. Adding or subtracting a constant number to the good and bad realizations does not change the difference between them, which measures the risk. Since the risk does not change, the rational actor’s behavior does not change. (We implicitly assume that the losses and gains are small enough for the actors to remain risk neutral.<sup>15</sup>) Subtracting a constant can change anti-insurance for gains into anti-insurance for losses, and adding a constant can change anti-insurance for losses into anti-insurance for gains, without changing the behavior of promisor and promisee.

To illustrate, assume that promisor’s performance creates 100 for the promisee, and non-performance creates 0. First, consider anti-insurance for gains, which doubles the

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<sup>15</sup> Strictly speaking, the constant that is added or subtracted to the possible realizations should be measured in utils, not dollars. We rely on the fact that a Von Neumann-Morgenstern utility function can be transformed linearly without changing the optimal values. In practice, dollars can be added or subtracted rather than utils, provided that the risk is small enough for the actor to be risk neutral. Throughout the paper we focus on risk neutrality because highly risk-averse actors want insurance more than anti-insurance.

gain of 100 from performance. To implement this result, the promisor and promisee pay the anti-insurer a fixed sum in advance, and the anti-insurer pays 100 to promisor in event of performance. In the event of non-performance, no one pays anything to anyone. Specifically, the non-performing promisor does not pay damages to the promisee. Promisor and promisee thus internalize the difference of 100 that is at risk, as required for efficient incentives.

Now consider the equivalent anti-insurance contract for losses, which doubles the loss of 100 from non-performance. To implement this result, the anti-insurer pays promisor and promisee a fixed sum in advance. In the event of performance, no one pays anything to anyone. In the event of non-performance, the promisee gets paid nothing and the promisor pays 100 to the anti-insurer. Promisor and promisee thus internalize the difference of 100 that is at risk, as required for efficient incentives.

In the preceding example, anti-insurance for gains pays the promisor and promisee (100,100) for performance and (0,0) for non-performance, and anti-insurance for losses pays (0,100) for performance and (-100,0) for non-performance. Subtracting 100 from the promisor's payoffs transforms anti-insurance for gains into anti-insurance for losses. The transformation does not change the incentives for risk-neutral actors because the difference in payoffs between performance and non-performance remains 100 for the promisor and 100 for the promisee.

Although anti-insurance for gains and losses can create the same incentive effects in theory, their practical consequences are different. Enforcing anti-insurance for losses and gains require different people to have different kinds of information. First consider

anti-insurance for gains. If the promisor performs, then anti-insurance for gains requires the anti-insurer to match the promisee's gain. The promisor must observe and verify how much the promisee actually gained from the contract in order to collect the payment owed to him by the anti-insurer. Second consider anti-insurance for losses. If the promisor fails to perform, then anti-insurance for losses requires the anti-insurer to collect an amount from the promisor that matches the promisee's loss. The anti-insurer must observe and verify how much the promisee actually lost from non-performance in order to collect the payment owed to him by the promisor.

Now we can state the difference in information required by the two kinds of anti-insurance. Anti-insurance for gains requires the promisor to know how much the promisee actually gained from performance that did occur, and anti-insurance for losses requires the anti-insurer to know how much more the promisee would have gained from performance than she actually gained from non-performance. The parties should typically choose between anti-insurance for gains and losses depending on the relative difficulty of proving in court the gains from performance or losses from non-performance.

## **VII. Anti-insurance vs. Other Legal Devices**

In the absence of anti-insurance, the law has some mechanisms to give incentives to the promisee without eroding the promisor's incentives. We will discuss mitigation of damages, foreseeability of damages, comparative negligence, and liquidated damages. We will also explain why all of these mechanisms are deficient.

According to the mitigation of damages rule, the breaching party is not liable for the damages that could have been reasonably mitigated by the aggrieved party. The promisee thus bears the burden of mitigating. Mitigation of damages can only occur after the promisee knows that a breach occurred.<sup>16</sup> Before breach, more reliance by the promisee increases the damage that breach will cause. The burden of mitigation does not

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<sup>16</sup> E. Allan Farnsworth, *Contracts* (1999), *supra* note 6, at p. 810.

extend backward in time to encompass reliance. Consequently, the burden of mitigation cannot solve incentive problems concerned with reliance.

Contract law has not developed a burden of reasonable reliance. Rather, contract law has developed the doctrine that plaintiffs are entitled to the foreseeable losses caused by breach. The burden of unforeseeable losses falls on the promisee unless he can shift them by giving notice to the promisor. This doctrine, which offers some restraint on reliance, stops far short of providing optimal incentives for reliance.

The comparative negligence (or fault) defense, which is generally not recognized by American law in the realm of contract law, works differently.<sup>17</sup> Under the comparative negligence rule, over-reliance before breach, or unreasonable failure to assist the promisor in performance, may reduce damages from breach.<sup>18</sup> This defense suffers

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<sup>17</sup> Although it gained some recognition in warranty cases, probably because of their affinity to tort cases. See White & Summers, *supra* note 12, *ibid*.

<sup>18</sup> For comparative negligence in contracts, and for various attitudes toward it in various jurisdictions, see Ariel Porat, "Contributory Negligence in Contract Law: Toward a Principled Approach" 28 *U. B. C. L. Rev.* 141 (1994); Ariel Porat, *Comparative Fault in Contract Law* (1997) (Hebrew). For comparative negligence in torts, see Robert Cooter & Tom Ulen, "An Economic Case for Comparative Negligence" 61 *N.Y.U. L. Rev.* 1067 (1986).

For a comparative negligence approach in contracts, see *S.J. Groves Co. v. Warner Co.* 576 F. 2d 524 (3d Cir. 1978). Groves was a subcontract for the replacement of a bridge's concrete decks parapets. Groves contracted with Warner for the delivery of concrete to the site. Because of defaults of Warner in performance Groves had to remove and replace defective slab from the site. Groves sued Warner for his losses. It was proved that Groves's crew also functioned inefficiently and weather conditions were extremely unfavorable. The district court found Warner liable for breach of contract, but award Groves only for one-fourth of the losses associated with the slab. The Federal Court of Appeal for the 3<sup>rd</sup> Circuit affirmed the trial court decision, reasoning that since both parties contributed to the loss "... The action of the trial judge in dividing the loss between the parties was a fair solution to a difficult problem...". For another case of the same type, see *Lesmeister v. Dilly* 330 N.W. 2d 95 (Minn. 1983).

Under certain circumstances non-disclosure of information during performance can also be regarded as comparative negligence, which may reduce damages from breach. Generally, courts are not willing to recognize one party's implied duty to provide the other with information during the performance of the contract. H. Collins, "Implied Duty to Give Information During Performance of

however from one main drawback that makes it inferior to anti-insurance. It is effective only when the behaviors of both parties are observable and verifiable. Otherwise the comparative negligence rule cannot supply efficient incentives to the parties. Anti-insurance is especially attractive when behavior that affects value is neither observable nor verifiable.

Another solution available in contract law is liquidated damages, which stipulate damages that the promisor must pay the promisee for breach, regardless of the magnitude of the promisee's actual loss. If liquidated damages equal the expected damages of breach, the promisor has efficient incentives to perform. At the same time, since his right to damages is not contingent on the magnitude of his actual harm, the promisee has efficient incentives to restrain reliance and mitigate damages. Liquidated damages, however, erodes the promisee's incentives to assist the promisor's performance. Liquidated damages cannot solve the problem of promisee's incentives to assist.

Like anti-insurance, non-legal sanctions often extract a price from the promise-breaker without giving damages to the victim. Another way to improve the promisee's incentives is for the court to deduct non-legal sanctions from damages owed by the promisor. We examine this possibility in another paper.<sup>19</sup>

The inadequacy of legal mechanisms to solve the incentive problems of promisor and promisee leave wide scope for the development of anti-insurance.

### **VIII. Extensions**

Until now we discussed anti-insurance for non-performance of contracts. Now we discuss briefly anti-insurance for torts. Our aim is to see whether anti-insurance might replace some mandatory legal rules. The law typically imposes strict liability for bodily injuries caused by defective consumer products. Strict product liability improves

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Contracts" (1992) 55 *M.L.R.* 556. Cf: *Bank of Nova Scotia v. Hellenic Mutual War Risks Association (Bermuda) Ltd, The Good Luck* [1989] 3 All E. R. 628, 664 *et seq.* (England, C.A.).

<sup>19</sup> Cooter & Porat, *supra* note 3.

manufacturers' incentives and erodes consumers' incentives to take care.<sup>20</sup> In situations where consumers significantly reduce their care, the law could allow manufacturers to substitute anti-insurance for strict product liability. Specifically, law would transfer the liability rights of consumers to anti-insurers, and in exchange the anti-insurers would pay a fixed fee to consumers. When a defective product harmed a consumer the manufacturers would pay compensatory damages to the anti-insurer. Anti-insurance would restore incentives for care by consumers, without eroding incentives for care by manufacturers.

In addition, anti-insurance for consumer product injuries would solve an insurance problem. People need insurance against medical costs and lost wages resulting from bodily injuries. However, people do not need insurance against pain and suffering. No one buys pain and suffering insurance in the private market. According to Viscusi's data, pain and suffering decreases the marginal utility of money, so insuring against pain and suffering is irrational.<sup>21</sup> By awarding damages for pain and suffering, the tort system over-insures potential victims.<sup>22</sup> Anti-insurance for the pain and suffering component of damages would eliminate over-insurance. Instead of receiving money that is not needed when a person suffers pain, uninjured people could receive a payment from the anti-insurer in exchange for the liability right. (In these circumstances, anti-insurance is a form of the market for unmatured tort claims.<sup>23</sup>)

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<sup>20</sup> Strict Product liability also creates adverse selection problems: G. Priest, "The Current Insurance Crisis" 96 *Yale L. J.* 1521 (1987).

<sup>21</sup> Kip Viscusi & William Evans, "Utility Functions that Depend on Health Status: Estimates and Economic Implications", 80 *American Economic Review* 353-374 (1990).

<sup>22</sup> Cf. S. A. Rea, "Non-Pecuniary Loss and Breach of Contract" 11 *J. Leg. Stud.* 35 (1982).

An exception, which can be explained, is uninsured motorist insurance, which typically gives the insured the right to recover damages, including pain and suffering, caused by an uninsured motorist.

<sup>23</sup> Robert D. Cooter, "Towards A Market in Unmatured Tort Claims" 75 *Va. L. Rev.* 383 (1989); R. Cooter (1998) "Liability Rights As Contingent Claims" M. M. P. N. John Eatwell, "Commodifying Liability" *The Fall and Rise of Freedom of Contract* (Durham, NC, Duke University Press, 1999, edited by Frank Buckley) 139. Cf. Robert Nozick, *Anarchy, State, and Utopia* 77 (1974), who suggested a system that would allow individuals to sell their estates' potential future rights to compensation to a company that would purchase many such rights.

Now we turn from consumer product injuries to implied warranties. Sometimes the law reads a warranty into a contract regardless of whether or not the parties agreed to it, as with the implied warrant of merchantability.<sup>24</sup> Often the law does not allow the parties to get rid of an implied warranty. The law should sometimes allow sellers to substitute anti-insurance for implied warranties. Specifically, the law should allow substitution in cases where the implied warranty significantly erodes the promisee's incentives to avoid triggering the warranty.

### **Conclusion**

When acts by different people affect the risk of a loss or gain, contracts or liability law often divides the risk and requires them to share it. Internalizing the risk, however, requires each of them to bear the undivided realization. Anti-insurance accomplishes internalization by a third-party contract that magnifies the risk. Anti-insurance, however, is a novel concept, not a product actively sold in markets. What obstructs the emergence of anti-insurance markets?

We can think of two possible legal obstacles. First, anti-insurance might be regarded as a kind of penalty clause in a contract. In fact, anti-insurance does not involve penalties. With anti-insurance, the promisor pays exactly for the harm caused by non-performance, no more and no less. The aggrieved party is not compensated, because he assigned his compensation rights to a third party, which contract law allows. Second, anti-insurance might be regarded as form of gambling contract that is unenforceable on grounds of public policy. In fact, the anti-insurer is not a gambler but rather someone who increases the value of contracts by improving incentives.

If there are no legal obstacles, what are the non-legal barriers? Perhaps the history of insurance provides the answer. Most forms of contemporary insurance were unknown in the 19<sup>th</sup> century. Lack of demand cannot explain the absence of many forms of insurance in the 19<sup>th</sup> century. People were presumably just as risk averse then as now.

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<sup>24</sup> White & Summers, *supra* note 12, at pp. 421-33.

There is little reason to think that risk spreading became more valuable to people as they became richer. (Just the opposite is true.) Instead, the explanation must be that insurance markets are fragile because they are so susceptible to abuse. Institutional innovations eventually overcame these problems. Specifically, insurers developed better actuarial methods to price insurance, a wider market reduced transaction costs, and insurers developed better methods to limit the destructive scope of moral hazard and adverse selection.

There is good reason to think that magnifying risk could often increase the value of contracts, but, like insurance, anti-insurance is fragile and susceptible to abuse. Anti-insurance awaits better actuarial method to price liability rights, a wide market to reduce transaction costs, and good methods to solve the victim's reporting problem. Working out the institutional forms will take time. Perhaps the necessary institutional innovations will appear in the 21<sup>st</sup> century. In any case, the prospects for anti-insurance markets will improve substantially after more people appreciate the concept.

## Mathematical Appendix

The appendix develops a two-person mathematical model of the verbal argument in the body of the paper.

### Definitions

(A,B) = two actors.

(a, b) = monetary equivalent of A's and B's respective inputs (time, effort, money) at time 1.

e = random variable representing nature's unobservable input at time 1.

v = value realized at time 2, where  $v < 0$  indicates a loss and  $v > 0$  indicates a gain.

=  $v(a,b,e)$ , where v is a concave function.

$v(a,b,e)f(a,b;e)$  = expected value of v at time 1, which both parties know, where f is the probability density function for e, so  $1 = \int f$ .

( , ) = A's and B's payoffs at time 2, respectively, expressed as a present value at time 1 in money or monetary equivalent.

=  $(a,b,e)$  is a function whose form is determined by technology, law, and contract.

=  $(a,b,e)$  is a function whose form is determined by technology, law, and contract.

### Social Optimum

Ex Ante Socially Efficient Values of (a,b):

$$(a^*,b^*) \text{ satisfy } \max_{a,b} v(a,b,e)f(a,b;e) - a - b \text{ subject to } a \geq 0 \text{ \& } b \geq 0. \quad (1)$$

with first order conditions

$$v_1(a^*,b^*,e)f + v(a,b,e)f_1(a,b;e) - a \leq 0 \quad (1a)$$

$$v_2(a^*,b^*,e)f + v(a,b,e)f_2(a,b;e) - b \leq 0 \quad (1b)$$

### Information Structure

a and b observed by A and not observed by B.

e not observed by A or B.

v observed by A and B.

f(e) known by A and B.

### Individual Behavior

A and B are individual maximizers who solve problems (2) and (3) respectively:

$$\max_a (a,b,e)f(a,b;e) - a \text{ subject to } a \geq 0. \quad (2)$$

$$\max_b (a,b,e)f(a,b;e) - b \text{ subject to } b \geq 0. \quad (3)$$

Subsequently we will assume that value is measured in interpersonally transferable utility. Thus conversion into dollars is possible for risk neutral actors.

### Social Efficiency

Define "internalization":

"Internalization by A"  $\Leftrightarrow v = v_1$ ,

"Internalization by B"  $\Leftrightarrow v = v_2$ .

Proposition 1: Internalization Implies Efficiency. Internalization of a risk by actors gives them efficient incentives for all the acts that affect it.

Proof: By definition of "internalization,"  $v = v_1 = v_2$ . This equality implies that the first order condition for (2) and (3) equals (1a) and (1b), respectively.

## Inefficiency of Sharing Rules

Losses and gains are often shared by the people who create them.

Define a “Sharing Rule” as a number  $0 \leq r \leq 1$  such that  $\pi_A = rv$  and  $\pi_B = (1-r)v$ , respectively.

Thus under any sharing rule  $\pi_A + \pi_B = v$ .

Here are four prominent examples of sharing rules in law.

Shared profits for gains between A and B at fixed rate  $r > 0$ :  $\pi_A = rv$  and  $\pi_B = (1-r)v$ , where  $v \geq 0$ ,

Shared liability for losses between A and B at fixed rate  $r > 0$ :  $\pi_A = rv$  and  $\pi_B = (1-r)v$ , where  $v \leq 0$ .

No liability of B for losses suffered by A:  $\pi_A = v$  and  $\pi_B = 0$ , where  $v \leq 0$ .

Liability of B for losses suffered by A:  $\pi_A = 0$  and  $\pi_B = v$ , where  $v \leq 0$ .

**Proposition 2: Inefficiency of Any Sharing Rule.** Any rule for sharing risk among actors provides one or more of them with inefficient incentives to affect the risk.

**Proof:** By Proposition 1, efficiency requires  $\pi_A = \pi_B = v$ , so the payoffs to A and B sum to  $2v$ . By definition, any sharing rule implies  $\pi_A + \pi_B = v$ , so the payoffs sum to  $v$ . Consequently, any sharing rule must violate at least one of the conditions for efficiency.

**Implication:** The rules of no liability, liability, and shared liability distribute losses inefficiently. Also profit sharing distributes gains inefficiently.

## Anti-insurance Contracts

### Defining Anti-insurance Contract

An anti-insurance contract has this structure:

At time 0, anti-insurer gives  $(p_a, p_b)$  to A and B, respectively, where  $p_a$  and  $p_b$  are positive for anti-insurance for losses and negative for anti-insurance for gains.

At time 1, A and B choose  $a$  and  $b$ , respectively.

At time 2,  $v$  is realized and shared by A and B in amounts  $(\alpha, \beta)$ , respectively, where  $\alpha + \beta = v$ .

The anti-insurer gives  $v - \alpha$  and  $v - \beta$  to A and B, respectively, which results in payoffs  $(\pi_A, \pi_B) = (v, v)$ .

We refer to  $(\pi_A, \pi_B)$  as “temporary payoffs” and we refer to  $(\pi_A, \pi_B)$  as “final payoffs.”

The anti-insurance contract requires anti-insurer to give  $(p_a, p_b)$  to A and B, respectively, at time 0, and to give  $v - \pi_A$  to A and  $v - \pi_B$  to B at time 2.

So an anti-insurance contract is described by  $(p_a, p_b, v - \pi_A, v - \pi_B)$

To illustrate, consider anti-insurance for A’s contractual promise to B.

At time 0, anti-insurer pays  $(p_a, p_b)$  to A and B, and B assigns his liability right to anti-insurer.

At time 1, the promisor A tries to perform and the promisee B possibly assists the promisor.

Nature also chooses a value  $e$ .

At time 2, the promisor either succeeds in performing or does not perform. Assume the latter, so A receives 0 and B loses  $v$ . Temporary payoffs are  $(\pi_A, \pi_B) = (0, v)$ .

Anti-insurer gives A the amount  $v - \pi_A$  which equals  $v$ , where  $v$  is negative. (Giving a negative amount to A is equivalent to A paying a positive amount to the anti-insurer.)

Anti-insurer gives B the amount  $v - \pi_B$  which equals 0.

So final payoffs are  $(\pi_A, \pi_B) = (v, v)$ .

### Efficiency of Anti-insurance

**Proposition 3: Efficiency of Anti-insurance.** For any sharing rule, an anti-insurance contract can internalize the risk for the actors.

**Proof:**

At time 0, anti-insurer pays  $(p_a, p_b)$  to A and B, respectively.

At time 2, A and B divide  $v$  according to the sharing rule:  $\pi_A = rv$  and  $\pi_B = (1-r)v$ .

At time 2, the anti-insurer gives  $v_-$  and  $v_-$  to A and B, respectively.

Thus at time 1,

A expects future payoffs equal to  $rv+v-rv = v$ , and

B expects future payoffs equal to  $(1-r)v+v-(1-r)v = v$ .

So A and B internalize the risk  $v$ .

### Note on perfect competition

Perfect competition among anti-insurers eliminates their profits, so all the value created by an anti-insurance contract goes to A and B. Thus we have the zero profit condition

$$0 = -(p_a+p_b) - (2v(a^*,b^*) - v) f(e).$$

### Controlling Acts v. Internalizing Consequences

For sharing rule  $r$ , let  $(a_r, b_r)$  denote the values of  $a$  and  $b$  that solve (2) and (3), respectively. A mechanism that causes efficient behavior  $(a^*, b^*)$  cause an increase in expected value given by

$$[v(a^*, b^*, e) f(e) - a^* - b^*] - [v(a, b, e) f(e) - a - b]. \quad (4)$$

One such mechanism is anti-insurance. Let  $t_a$  denote the transaction cost of anti-insurance. Pricing risk by anti-insurance creates an expected net benefit equal to (4) -  $t_a$ . The transaction cost  $t_a$  equals the cost of observing and verifying each actors' share of the contract's realized value as given by  $(v-\alpha)$  and  $(v-\beta)$ .

Alternatively, the parties can contract to act efficiently. Specifically, A can contract to set  $a=a^*$ , and B can contract to set  $b=b^*$ . Let  $t_s$  denote the transaction cost of these contracts, including enforcement costs. Using contracts to control acts that affect risk creates an expected net benefit equal to (4) -  $t_s$ . The transaction cost  $t_s$  equals the cost of observing and verifying, the vector of inputs  $(a, b)$ .

Contracts for control are incomplete when the cost of observing and verifying some inputs are prohibitive.

We summarize these arguments in the following proposition.

Proposition 4: Anti-insurance v. Controls. To choose between anti insurance and direct controls, balance

- (a) the cost of observing and verifying the realization of the risk;
- (b) the cost of observing and verifying the acts that influence the risk;
- (c) the distortions created by direct controls due to uncontrollable acts.

### Anti-insurance for Gains and Losses

Anti-insurance for losses means that the anti-insurer pays a flat fee in advance for the promise of the promisor and promisee to pay him an amount equal to any loss that they subsequently realize.

Consequently, we have  $(p_a, p_b) > 0$  and  $(v_-, v_-) < 0$ .

Anti-insurance for gains means that promisor and promisee pay anti-insurer a flat fee in advance for his promise to pay them an amount equal to any gain that they subsequently realize. Consequently, we have

$(p_a, p_b) < 0$  and  $(v_-, v_-) < 0$ .

(Mixed cases also arise when realizations can be positive or negative.)

Proposition 5: Equivalence of Anti-insurance For Gains and Losses. For each efficient anti-insurance contract for gains there corresponds an efficient anti-insurance contract for losses, and vice versa.

Proof.

1. Consider the anti-insurance contract  $(p_a, p_b, v_-, v_-)$ . Assume without loss of generality that this is anti-insurance for gains:  $(p_a, p_b) > 0$  and  $(v_-, v_-) < 0$ .

2. This anti-insurance contract causes perfect internalization:  $v = v_- = v_+$ . Consequently, incentives are efficient by Proposition 1.

3. Let  $v_b$  be a constant called the "baseline."

4. Consider the new anti-insurance contract  $(p_a, p_b, v - v_b - \underline{v}, v - v_b - \underline{v})$ .  $v - v_b$  can be interpreted as damages for falling short of the baseline or a reward for exceeding it. Instead of perfect internalization, the new anti-insurance contract shifts final payoffs by  $v_b$ .

5. Let the baseline be sufficiently small so the new contract is anti-insurance for losses; e.g.  $(v - v_b - \underline{v}, v - v_b - \underline{v}) > 0$  and  $(p_a, p_b) < 0$ .

3. The baseline is a constant with no effect on equations (2) and (3), so the first order conditions of individual optimization still equal (1a) and (1b). The new anti-insurance contract for losses provides efficient incentives as did the original anti-insurance contract for gains.

In general, subtracting a sufficiently large constant from the final payoffs can transform an anti-insurance contract for gains into an anti-insurance contract for losses.