

SHAREHOLDER OPPORTUNISM
IN A WORLD OF RISKY DEBT

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ABSTRACT

Modern finance is increasingly dominated by contracts such as credit default swaps, put options and loan guaranties. These contracts create “contingent” liabilities, which become payable only upon the occurrence of an uncertain future event. This Article identifies a pervasive opportunism hazard presented by contingent liabilities that lawmakers and scholars have overlooked. If a contingent liability is especially likely to be triggered when the liable firm is insolvent, the contract that creates the liability transfers value from the firm’s creditors to its shareholders. Firms thus have incentive to engage in *correlation-seeking*—that is, to incur contingent debt that correlates, or through asset purchases can be made to correlate, with their insolvency risk. An example is AIG, which collapsed because it bought up assets that were likely to lose value just as large liabilities on its credit default swaps were triggered. Such conduct generates social costs such as overinvestment, more frequent financial distress, and potential systemic risk.

Despite these costs, legal doctrines that aim to protect creditors ignore matters of correlation. Such measures instead analyze contingent liabilities under principles designed to prevent misuse of “fixed” liabilities such as simple loans. But these principles provide almost no basis for distinguishing opportunistic contingent liabilities from those that are benign. This is especially problematic because correlation-seeking can cause a contingent liability to produce a much larger opportunistic transfer than would a fixed liability of equal face value. Lawmakers thus should redesign key legal doctrines to reflect the essential economic differences between contingent and fixed debt.

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INTRODUCTION

In 2005, as the housing market was approaching its peak, derivative traders at AIG were reaping huge profits selling credit default swaps linked to subprime mortgages. This in itself is not surprising: AIG is, after all, an insurance company, and a credit default swap is essentially an insurance policy on a bond or similar security. What is startling is that AIG was simultaneously buying up piles of mortgage-backed securities for its own investment portfolio. This meant that the risks borne by the company were correlated: its asset holdings were likely to evaporate just as large-scale liability on its swap contracts was triggered. When the housing market finally collapsed, the combined damage to both sides of the balance sheet was more than enough to sink the company.

This Article explains why seemingly reckless conduct of this type can in fact be fully rational from the perspective of a firm's shareholders. The Article identifies a fundamental opportunism hazard created by contingent liabilities, a hazard I term *correlation-seeking*. If a contingent liability is especially likely to be triggered when the liable firm is insolvent, the contract that creates the liability transfers value from the firm's unsecured creditors to its shareholders. That transfer gives managers an incentive to sell contingent claims against their firm that correlate with the firm's insolvency risk, even when doing so generates large social costs such as overinvestment and possible systemic risk. The potential for correlation-seeking to destroy wealth is vast given the

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widespread use in the modern economy of contingent debt contracts, which include derivatives such as credit default swaps and put options, as well as more traditional arrangements such as loan guaranties.

Despite the pervasiveness of the hazard, lawmakers and scholars have overlooked correlation-seeking. For this reason, legal rules that aim to prevent shareholder opportunism toward creditors regulate contingent liabilities under principles designed for “fixed” liabilities—that is, debts that are certain to come due on a specified future date. Accordingly, a contingent liability is treated as less of an opportunism hazard precisely because it is (by definition) less likely than a fixed liability to come due. On this view, a contingent liability is like a fixed liability, only less so.

There are several basic problems with this standard view of contingent liabilities. The first is that, counterintuitively, a contingent liability can produce a significantly *larger* opportunistic wealth transfer than will a fixed liability of equal face value. This is because a firm that incurs a \$100 fixed liability (such as by taking out a simple loan) typically receives close to \$100 in new assets (the loan proceeds) in exchange. And those new assets mostly neutralize the fixed liability’s dilutive effect on the firm’s unsecured creditors. But when a firm incurs a \$100 contingent liability that is, for example, only 10% likely to come due, the firm will receive in exchange new assets worth no more than \$10. And, if the contingent liability is especially likely to be triggered when the firm is insolvent, this mismatch between the new assets and the liability’s \$100 face value greatly reduces the expected recoveries of the firm’s unsecured creditors.

There is a second important reason that contingent debt presents the larger opportunism hazard. To use fixed debt to capture wealth from unsecured creditors, a firm increases its leverage—that is, it substitutes debt for equity. But higher leverage makes equity returns more volatile, meaning that shareholders must bear more risk to get higher returns. And this same tradeoff is an inescapable feature of “asset substitution,” a form of shareholder opportunism whereby a firm exchanges low-variance assets for high-variance assets. By contrast, the volatility of equity returns often *falls* as the correlation between a firm’s contingent liabilities and its insolvency risk rises. Correlation-seeking is thus especially pernicious, because it frequently avoids a risk-return tradeoff that tends to make other forms of opportunism toward creditors self-limiting.

Finally, a view that conflates fixed and contingent debt is problematic because the opportunism mechanisms are different for each. What matters with fixed liabilities is their total face amount relative to the firm’s equity value. The higher this ratio, the greater the degree to which losses are borne by the firm’s creditors rather than shareholders. By contrast, a contract that creates a contingent liability with even a relatively large face (or “notional”) value can either benefit or harm a firm’s unsecured creditors, depending on whether the correlation between the contingency and the firm’s insolvency risk is negative or positive. For this reason, legal measures that focus only on a contingent liability’s face amount, and ignore the correlation question, will produce results almost totally unrelated to the actual opportunism hazard.

The failure by lawmakers to recognize the pivotal role of correlation in the economics of contingent debt is a major shortcoming of traditional creditor protection doctrines, the most important of which is fraudulent conveyance law. And this failure

also mars the current Administration's proposed approach to regulating derivative contracts, which similarly takes no account of correlation. Rather, the Administration intends to rely on standard measures for preventing overuse of fixed debt, such as higher capital and collateral requirements. Under such measures, the costs of using all derivatives would rise, but firms could still engage in the type of opportunism that creates the risk of another AIG in the future.

To prevent the high social costs of correlation-seeking, legal rules for contingent debt need to be fundamentally rethought. For example, fraudulent conveyance law requires a new set of principles that take account of the essential economic differences between contingent and fixed debt. And proposed rules for derivatives should be redesigned to target opportunism incentives. A powerful first step in this regard would be the repeal of special Bankruptcy Code exemptions that now give derivative counterparties priority over an insolvent firm's other unsecured creditors. Those exemptions undermine the counterparties' incentive to monitor to prevent correlation-seeking, even though their sophistication would make them better monitors than most other creditors. Such reform is especially important because the bailouts of large financial firms have further undermined creditor monitoring incentives by shifting the consequences of correlation-seeking onto another group of unsecured "creditors": U.S. taxpayers. To the extent market participants perceive that a precedent has been set for more bailouts in the future, correlation-seeking is a bigger hazard than ever.

The remainder of this Article proceeds in three parts. Part I explains the economics of correlation-seeking. Part II uses the example of AIG to illustrate how correlated liability and asset risks can cause large-scale destruction of social wealth. And Part III discusses how lawmakers should redesign key legal doctrines to target the distinct opportunism hazard that contingent liabilities present.

I. THE ECONOMICS OF CORRELATION-SEEKING

This Part analyzes the economics of contingent debt opportunism. Section A uses a simple model of a business firm to explain why a positive correlation between the risk that a firm will fall insolvent and the risk that its contingent liabilities will be triggered enriches the firm's shareholders at the expense of its unsecured creditors. Section B adds numbers to the model to demonstrate that a contingent liability with such a correlation presents a larger opportunism hazard than does a fixed liability for the same face amount. Section C explains that correlation-seeking is especially pernicious because, unlike the forms of opportunism toward creditors that scholars have previously studied, it often reduces the amount of risk borne by shareholders even while it increases their returns. And Section D explains why correlation-seeking generates large costs that destroy social wealth.

A. How Correlation Determines The Impact Of A Contingent Liability

A liability is "contingent" if it becomes payable only upon the occurrence of an uncertain future event. Firms often agree to incur contingent liabilities by contract, such as when they give a guaranty, "write" a put option, or sell a credit default swap. In each case, the debtor (that is, the firm liable if the contingency occurs) receives an up-front

payment, or “premium.” In exchange, the debtor promises to make a payment to the claimant (the other party to the contract) if a “triggering” event occurs in the future. For example, if the contract is a guaranty on a loan, the triggering event would be the failure of a third party to repay a debt to the claimant. If the contract is a put option, the triggering event would be the decline of a stock price below the specified “strike price.”¹ And for a credit default swap, the triggering event would be a default by an issuer of a debt-like instrument, such as a corporate bond or mortgage-backed security.

The main question of interest in this Article is, who bears the burden when a contingent liability is triggered? Normally the burden falls on the debtor’s shareholders, because the liability reduces the debtor’s equity value. But if the triggering event occurs when the debtor is insolvent—meaning its liabilities exceed the value of its assets—the contingent liability makes no difference to the shareholders, whose stake in the debtor is wiped out anyway. In that case the contingent liability is borne instead by the debtor’s unsecured creditors, because it dilutes their recoveries from the debtor’s bankrupt estate.² Despite this fact, firms normally do not need the consent of their unsecured creditors to enter into contracts that create contingent liabilities. A firm therefore can incur a contingent liability to “sell” the claimant a piece of the firm’s future bankrupt estate—a piece that, but for the liability, would go to the firm’s unsecured creditors. The sales price will be imputed into the premium, which enriches the firm’s shareholders as long as the firm remains solvent. For this reason, a contract that creates a contingent liability presents an opportunism hazard, because a firm might enter into such a contract not because doing so creates economic value, but rather because the contract has the expected effect of transferring future wealth from the firm’s unsecured creditors to its shareholders, with the claimant serving in essence as the fence for the stolen goods.

The factor that determines whether a contract that creates a contingent liability will be expected to transfer wealth from the debtor’s unsecured creditors to its shareholders is the correlation between the risk that the liability will be triggered and the risk that the debtor will fall insolvent. As a shorthand, I will call this the “internal” correlation on the contingent liability. The higher the internal correlation, the greater the degree to which shareholders are gambling with other people’s money when they permit their firm to incur the contingent liability. In essence, a positive internal correlation creates a “heads we win, tails you lose” scenario: if the contingent liability is not triggered, the shareholders keep the premium; if it is triggered, the shareholders are wiped out anyway, and the claimant’s recovery instead comes out of the pocket of the

¹ Conversely, a call option can also be seen as creating a contingent liability if the writer of the option—that is, the party who, if the option is exercised, is obligated to sell shares of stock at the strike price—does not own the underlying shares when the contract is written.

² For a firm’s unsecured creditors to bear the full brunt of a contingent liability triggered when the firm is insolvent, the firm’s equity investors must enjoy limited liability, which is why I refer to those investors as “shareholders,” implying the firm is a corporation. But limited liability is a feature of most other widely used modern business entities, including the limited liability company, limited liability partnership, and Delaware statutory trust. See Henry Hansmann, Reinier Kraakman & Richard Squire, *Law and the Rise of the Firm*, 119 HARV. L. REV. 1333, 1397 (2006). Only the common-law partnership continues to hold equity investors fully liable for firm debt, although even in that case the dynamic I describe here would arise to the extent that partners’ personal assets are insufficient to cover partnership debt.

debtor's unsecured creditors.

To be sure, a contingent liability contract can also confer a benefit on the debtor's unsecured creditors. That benefit takes the form of the premium, which becomes part of the debtor's estate, and thus will augment creditor recoveries if the debtor falls insolvent. But it is important to observe that the premium paid for a contingent liability will be smaller—and, usually, several times smaller—than the liability's "face value," which is the amount the claimant is entitled to collect if the liability is triggered. For example, if a contingent liability's face value is \$25, and the probability of the triggering event is 10%, then a rational claimant will pay a premium of no more than \$2.50.³ This disparity between the face value and the premium generally will not harm the debtor's unsecured creditors if the liability's internal correlation is negative, because in that case the burden of the liability will likely be borne by the debtor's shareholders. But the expected impact changes when the internal correlation is positive, meaning that the liability is especially likely to be triggered when the debtor is insolvent. In that situation, the unsecured creditors do suffer a large expected loss, because they are likely to benefit from the premium only when they also bear the burden of the (much larger) liability.

To better understand why the internal correlation on a contingent liability drives the opportunism hazard, it will be useful to consider a simple model of a business firm. Suppose that Debtor is a corporation that is owned and controlled by Shareholders. Initially, Debtor has some assets and one liability: a debt to Unsecured Creditor. Debtor's assets at first are worth more than Unsecured Creditor's claim, which is another way of saying that Debtor starts out solvent. The model plays out over two periods. In period one, Debtor enters into a contract with Claimant that creates a contingent liability. Under this contract, Claimant pays Debtor a premium in period one, and Debtor agrees to make a payment to Claimant if a specified triggering event occurs in period two. I will assume that the size of the premium equals the amount that Claimant expects to collect from Debtor on the contract, which is the largest premium a risk-neutral party in Claimant's position would rationally pay.⁴ Because the probability that the contingent liability will be triggered is (by definition) less than 100%, the premium will—as explained above—always be smaller than the liability's face value. In period two, Debtor experiences two types of risk. The first is that the triggering event will occur. And the second is that Debtor's business will suffer a downturn deep enough to render Debtor insolvent, meaning that Debtor's assets (now augmented by the premium) depreciate to less than the amount owed Unsecured Creditor. At the end of period two, the debt to Unsecured Creditor comes due, and the payouts for the parties are determined. I will assume for now that if the contingent liability is triggered but Debtor does not suffer a

³ The claimant will actually pay something less than \$2.50 due to the time value of money and the risk that the debtor defaults on the contract.

⁴ In theory, a contingent liability contract might generate efficiencies that benefit the claimant, and the debtor might be able to capture the value of these in the premium. The most obvious efficiency would be to smooth out the returns on an investment portfolio, assuming the claimant is risk-averse. However, I am already recognizing the potential of such a benefit by assuming that Claimant does not apply a risk-based penalty in her valuation of her uncertain recovery on the contract. A second possibility would be that the contract induces the debtor to try to prevent the triggering event, such as by monitoring the "reference" entity. This benefit is most likely to arise in the case of a guaranty. *See* text at note 100, *infra*.

downturn, Debtor's assets are worth enough to cover in full the amounts owed both Unsecured Creditor and Claimant.

The following table identifies the model's four possible outcomes, and indicates whether each is more likely with a positive or negative internal correlation:

Figure One: The Outcomes Of A Contingent Liability Contract

		Contingent Liability	
		<i>Not triggered</i>	<i>Triggered</i>
Debtor	<i>No Downturn</i>	Shareholders Enriched (+ correlation)	Shareholders Harmed (- correlation)
	<i>Downturn</i>	Unsecured Creditor Enriched (- correlation)	Unsecured Creditor Harmed (+ correlation)

As the table suggests, Shareholders and Unsecured Creditor have opposing interests in terms of the internal correlation. Shareholders will prefer that the correlation be positive, while Unsecured Creditor will prefer a negative correlation. Because Shareholders control Debtor, we can expect them to select its contingent liabilities accordingly.

Consider the perspective of Shareholders first. If Debtor suffers a downturn, they do not care whether the contingent liability is triggered, because in those outcomes their equity stake is wiped out regardless. If Debtor does not suffer a downturn, they are better off if the liability is not triggered (upper left outcome in Figure One), which will be more likely if the internal correlation is positive. In that outcome, Debtor's equity value has been augmented by the premium, and Debtor does not have to make a payment to Claimant. On the other hand, Shareholders on net are harmed by the contingent liability contract if Debtor does not suffer a downturn but the liability is triggered (upper right), which will be more likely if the internal correlation is negative. This is because of the face-value/premium mismatch I described earlier: the fact that, when the contingent liability is triggered, Claimant takes more from Debtor's estate than she earlier paid into it. Therefore, the equity value of Debtor in this outcome will be smaller than it would have been had Debtor never "sold" Claimant a contingent liability in the first place. In short, the contingent liability contract tends to enrich Shareholders when the internal correlation is positive, and to harm them when it is negative.

Now consider the contingent liability contract from the perspective of Unsecured Creditor. He is indifferent to it in the two outcomes where Debtor does not suffer a downturn, because then he is paid in full regardless of whether the liability is triggered. If Debtor does suffer a downturn, he prefers that the liability not be triggered (lower left), which is more likely with a negative internal correlation. This is because the premium

enhances the value of Debtor's insolvent estate, and he does not have to share that estate with Claimant.⁵ On the other hand, he is made worse off by the contract if Debtor suffers a downturn and the liability is triggered (lower right), an outcome more likely with a positive internal correlation. In this outcome, Unsecured Creditor and Claimant divide Debtor's bankrupt estate between them. How they divide it depends on whether Claimant has a secured or unsecured claim, with a secured claim giving Claimant a larger recovery than an unsecured claim would. But in either case Unsecured Creditor's recovery is smaller than it would have been had Debtor not entered into the contract with Claimant in the first place, once again because the amount Claimant collects when her claim is triggered is larger than the premium. In short, the contingent liability contract tends to enrich Unsecured Creditor when the internal correlation is negative, and to harm him when it is positive, the mirror image of its impact on Shareholders. It follows that, as the internal correlation rises, so does the likelihood that the contract will enrich Shareholders at the expense of Unsecured Creditor.

Besides the fact that it forces him to shoulder more risk, there is a second reason that a positive internal correlation harms Unsecured Creditor: it reduces the size of the premium. By definition, Claimant collects from Debtor only in the two outcomes when her claim is triggered. Between these, she prefers the outcome when Debtor does not suffer a downturn (upper right), because Debtor is then solvent and can pay the full face value of her claim. And this outcome is more likely when the internal correlation is negative. If instead the claim is triggered when Debtor is insolvent (lower right), Claimant recovers only a portion of her claim if she is unsecured, and she also recovers only a portion if she is secured but the secured assets have depreciated to less than her claim's face value. And this outcome is more likely with a positive internal correlation. It follows that, as the internal correlation rises, the premium shrinks.⁶ And this reduction in the premium harms Unsecured Creditor by decreasing the total value of Debtor's assets and hence his recovery in a bankruptcy proceeding. A positive internal correlation thus lands a one-two punch on Unsecured Creditor: it increases the likelihood that, if Debtor falls insolvent, he will have to share Debtor's assets with Claimant; and it also reduces the value of those assets by shrinking the premium that Claimant is willing to pay.

The fact that Claimant will pay a smaller premium as the internal correlation rises creates the possibility that she too could become an opportunism victim. Thus, so far I have depicted correlation-seeking as a strategy whereby a debtor first acquires some assets, and then incurs a contingent liability that is especially likely to be triggered if those assets lose value. But the reverse maneuver is also possible: a debtor could first incur a contingent liability, and then exchange its assets for others that are more likely to lose value if the liability is triggered. This type of "reverse" correlation-seeking would similarly produce an expected wealth transfer away from the debtor's unsecured creditors—including potentially the claimant herself. Correlation-seeking of this type is

⁵ The premium will likely depreciate with the rest of Debtor's estate, making it more accurate to say that in this outcome Unsecured Creditor recovers what remains of the premium.

⁶ The implicit assumption is that the probabilities of the four outcomes are known to both Debtor and Claimant when they negotiate the premium amount in period one.

not the same thing as “asset substitution,” a term that refers to the conversion of low-risk (that is, low-variance) assets to high-risk (high-variance) assets.⁷ What I am describing here is not an increase in the variance of asset values, but rather the selection of assets that are especially likely to depreciate when a debtor’s liability level rises.⁸

A natural question at this point is, why would creditors permit their debtor to engage in correlation-seeking? At least in theory, creditors who extend credit voluntarily—that is, those other than tort victims—could negotiate and enforce loan covenants that forbid opportunism. The problem, however, is that such steps are not worthwhile to creditors for whom the costs of monitoring the debtor’s transactions with third parties are greater than the expected negative impact of those transactions on the creditors’ recoveries.⁹ Thus, Marcel Kahan and Edward Rock have recently observed that bond covenants meant to prevent opportunism are regularly underenforced, because covenant violations are costly to detect, enforcement actions are hard to initiate, and bondholders face collective action problems.¹⁰ The existence of a variety of special equitable remedies for creditors—such as those provided by fraudulent conveyance law and voidable preference doctrine—testifies to the fact that contract law is often not a cost-effective device for fully deterring wasteful debtor opportunism. Thus, rather than try to monitor, many creditors will simply impute opportunism risk into the interest rate they demand up front from all debtors, a strategy that does not deter opportunism because the debtor pays the same interest rate regardless of what it does after it borrows.¹¹ This strategy does, however, create a deadweight loss in the credit market, a point I will revisit when discussing the social costs of correlation-seeking in Section D.

B. The Size Of The Hazard: Contingent Versus Fixed Liabilities

The discussion to this point explains why correlation-seeking presents an opportunism hazard. But is it a hazard worth worrying about? Lawmakers seem to think the answer is no. Thus, legal doctrines that aim to protect creditors have consistently ignored questions of correlation. Instead, those doctrines apply the same general

⁷ See, e.g., Hideki Kanda & Saul Levmore, *Explaining Debtor Priorities*, 80 VA. L. REV. 2103, 2107-09 (1994). Also, the two are not mutually exclusive: a debtor could maximize the expected transfer away from its unsecured creditors by acquiring assets that are high-variance when considered in isolation, and that also are especially likely to drop in value when the debtor’s contingent liabilities are triggered.

⁸ I discuss the relationship between correlation-seeking and asset substitution more fully in Section I.C.

⁹ See Lucian Arye Bebchuk & Jesse M. Fried, *The Uneasy Case for the Priority of Secured Claims in Bankruptcy*, 105 YALE L.J. 857, 864 (1996) (describing why many creditors do not protect themselves from the risk that their debtor will use a secured loan to subordinate their claims); Elizabeth Warren & Jay Lawrence Westbrook, *Contracting Out of Bankruptcy: An Empirical Intervention*, 118 HARV. L. REV. 1197, 1236 (2005) (finding that a large percentage of creditors of bankrupt debtors will not find it cost-effective to enforce loan covenants preventing their debtors from increasing the amount of risk they bear).

¹⁰ See Marcel Kahan & Edward Rock, *Hedge Fund Activism and the Enforcement of Bondholder Rights*, 103 NW. U. L. REV. 281, 296-301 (2009). The authors argue that activist hedge funds can overcome the underenforcement problem, but note that incentive problems remain. *Id.* at 309.

¹¹ Richard Squire, *The Case for Symmetry in Creditors’ Rights*, 118 YALE L.J. 806, 841 (2009) (making the same point with respect to the secured loan).

principles to contingent liabilities that they apply to “fixed” liabilities—meaning loans and other debt obligations that are certain to come due on a specified future date.¹²

This failure by lawmakers to develop separate creditor protection principles for contingent liabilities could in theory be justified if either of two propositions were true. The first would be that contingent liabilities produce smaller opportunistic wealth transfers than fixed liabilities, and thus do not merit special attention. On an intuitive level this notion has some appeal: a claim that is 100% likely to come due—which is what a fixed liability represents—seems a much bigger dilution threat to the debtor’s unsecured creditors than a claim for the same face amount that is only (say) 10% likely to come due. Some version of this notion seems to motivate standard accounting rules, which require a firm to accrue a loss if a liability is certain or “probable,” but permit liabilities with merely a “reasonable possibility” of coming due to be consigned to footnotes.¹³ And “remote” contingencies can be omitted from financial statements altogether.¹⁴

Contrary, however, to what intuition might say, it can readily be shown that a contingent debt will typically capture several times *more* expected wealth from the debtor’s unsecured creditors than will a fixed debt for the same face amount, as long as the internal correlation is high enough. The reason is that, if a contingent debt is especially likely to be triggered when the debtor is insolvent, then the typically large disparity between the debt’s face value and the premium will greatly dilute the expected recoveries of the debtor’s unsecured creditors. By contrast, when a debtor incurs a fixed debt (for example, when it takes out a loan), it typically receives new assets (the loan proceeds) that approximate the debt’s face value, and thus largely neutralize the dilutive effect on the debtor’s estate.

The second potential justification for the lack of separate creditor protection principles for contingent liabilities would be that, regardless of whether the liability is contingent or fixed, the opportunism mechanism was the same. Thus, what matters with fixed liabilities is leverage, meaning the total face value of outstanding debt relative to a firm’s equity value. When a firm increases its leverage, it transfers value from its current unsecured creditors to its shareholders.¹⁵ In theory, contingent liabilities could transfer wealth primarily by the same mechanism, with the size of the transfer driven mostly by the total face value (or, in the language of derivatives, “notional amount”) of the contingent debt on the debtor’s books.

¹² I discuss two examples of such doctrines in Part III.

¹³ CODIFICATION OF ACCOUNTING STANDARDS AND PROCEDURES, Statement of Financial Accounting Standards No. 5, ¶ 8 (Financial Accounting Standards Board 1975).

¹⁴ *Id.* ¶¶ 8, 12. On the other hand, the Financial Accounting Standards Board has issued an interpretation that requires a firm to accrue a liability when it issues a guaranty, even if payments on the guaranty are less than probable. *Id.* no. 45. Interestingly, this interpretation specifically exempts intragroup guaranties, even though these usually have high internal correlations, and thus present a much larger wealth-transfer hazard than does the typical guaranty. See text at note 100, *infra*.

¹⁵ See Yedidia Z. Stern, *A General Model for Corporate Acquisition Law*, 26 J. CORP. L. 675, 706-08 (2001); Marcel Kahan & Michael Klausner, *Antitakeover Provisions in Bonds: Shareholder Protection or Management Entrenchment*, 40 U.C.L.A. L. Rev. 931, 941 (1993).

Like the first proposition, this also cannot survive scrutiny. As long as a contingent liability's face value is no greater than the debtor's equity value, the direction of the liability's impact is driven *entirely* by the internal correlation. Thus, if the correlation is positive the liability will be expected to harm the debtor's unsecured creditors, if negative to enrich them, and if zero to have no meaningful effect in either direction. To be sure, questions of correlation and of face value begin to merge if the face value is greater than the debtor's equity value, because in that case the triggering of the liability is sufficient in itself to render the debtor insolvent. But even in that situation, the correlation between the risk of the triggering event and the risk of an asset downturn will still have a large impact on the size of the wealth transfer. It also is important to note that this scenario—where a firm's contingent debt is large enough in itself to cause insolvency—can arise not only from a single, large liability. It also can arise if a firm incurs multiple contingent claims that have a high probability of being triggered simultaneously, and whose combined effect would be enough to break the firm. And in that situation once again the key question is one of correlation, which creditor protection rules now ignore.

To demonstrate these points, it will be useful to consider a pair of numerical examples based on the simple model from the previous section. The examples will cover two general cases. The first is the one I outlined in the previous section, where the contingent liability's face value is no greater than Debtor's equity value, and therefore Debtor can pay both Claimant and Unsecured Creditor in full if the liability is triggered but Debtor does not suffer a downturn. The second case considers the alternative possibility, where the face value is larger than Debtor's equity value, and thus the contingent liability is large enough to render Debtor insolvent even if Debtor's assets do not lose value.

1. Contingent Liability No Larger Than Equity Value

To analyze the first case, I take the simple model from the previous section and assume that the initial value of Debtor's assets is \$125, and the amount owed Unsecured Creditor is \$100. This makes for a debt-equity ratio of 4:1, a relatively conservative level that is useful to assume because it permits analysis of a contingent liability whose face value is relatively large but not enough in itself to cause insolvency. I further assume that Debtor's assets lose 40% of their value in a downturn, and that a downturn occurs 10% of the time. In the world of corporate debt this would make Debtor a high credit risk; I will later address the implications if Debtor were "safer." I also will assume that the probability that the contingent liability is triggered is 10%. Because this is the same as the probability that Debtor suffers a downturn, it permits exploration of the full possible range of positive internal correlations.¹⁶ Next, I will assume that the face value of the liability (that is, its value if triggered) is \$25, which is the largest amount consistent with the structural assumption that the contingent liability cannot itself drive Debtor insolvent. Finally, I will assume that Claimant has an unsecured claim, which means that she and Unsecured Creditor divide Debtor's assets pro rata in case of Debtor's insolvency.

¹⁶ If on the other hand Debtor's downturn risk were 10% but the contingency risk were only 5%, the highest possible correlation between the risks would be 0.69. See note 18, *infra*.

Figure Two shows the consequences of a contingent liability with these characteristics on Unsecured Creditor¹⁷:

Figure Two

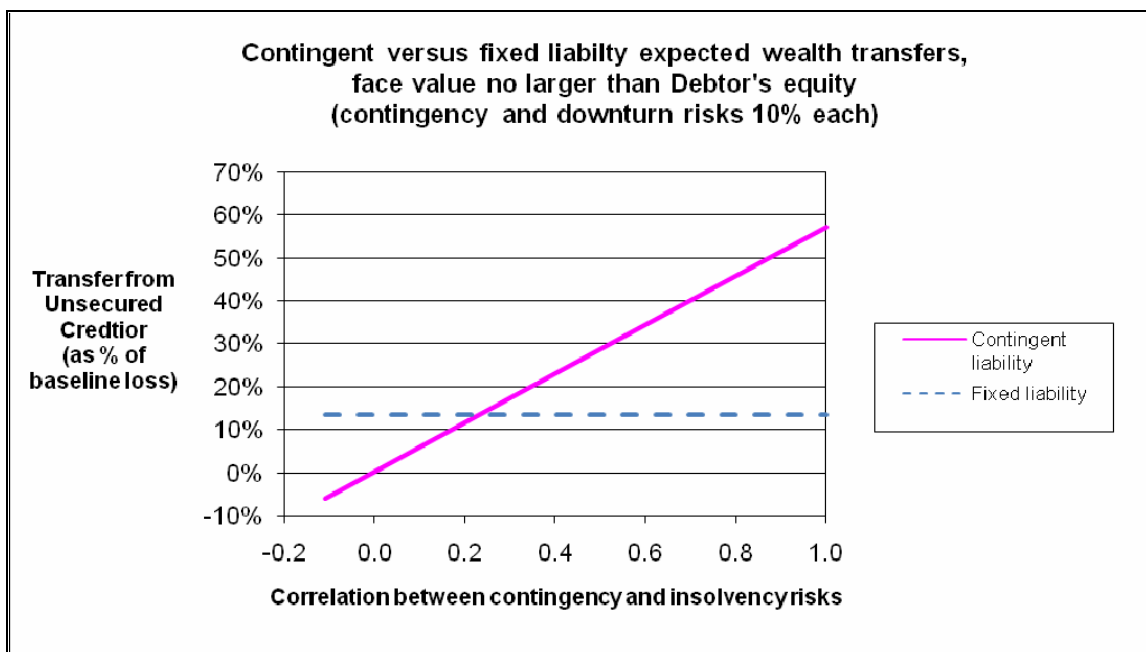


Figure Two's x-axis represents the correlation between the risk that the contingent liability is triggered and the risk that Debtor falls insolvent.¹⁸ The y-axis represents the

¹⁷ For all formulae used in this Article, the following terms are used:

- A: initial value of Debtor's assets
- D: amount Debtor owes Unsecured Creditor
- C: face value of liability to Claimant
- V: total face amount of Debtor's outstanding debts, or D+C
- d: discount factor (between 0 and 1) used to determine value of Debtor's assets in downturn
- P: premium paid by Claimant for claim against Debtor (fixed or contingent)
- T: expected wealth transfer (negative when wealth is transferred away from Unsecured Creditor, positive when wealth transferred to him)
- R: Unsecured Creditor's baseline loss
- p(ul), p(ur), p(ll), p(lr): probabilities of Figure One's upper left, upper right, lower left, and lower right outcomes, respectively

Assuming that $A \geq V$ and that Claimant is unsecured, the formula for the premium is:

$$P = p(ur) \cdot C + p(lr) \cdot [C/V] \cdot d[A+P];$$

which solved for P gives:

$$(1) P = [p(ur) \cdot CV + p(lr) \cdot dAC] / [V - p(lr) \cdot dC].$$

The formula for the expected wealth transfer is:

$$(2) T = p(ll) \cdot dP + p(lr) \cdot [[D/V] \cdot d[A+P] - dA].$$

¹⁸ The x-axis represents the correlation coefficient between two dummy variables that correspond to the contingency and insolvency risks. The first variable corresponds to the risk of the triggering event, and is 0 when the event does not occur and 1 when it does. The second corresponds to the risk that Debtor falls

expected wealth transfer away from Unsecured Creditor caused by the contract between Debtor and Claimant. The transfer is expressed as a percentage of Unsecured Creditor's "baseline loss," by which I mean the amount that Unsecured Creditor would be expected to lose on his \$100 claim if Debtor did not enter into the contract with Claimant.¹⁹ Expressing the wealth transfer as a percentage of the baseline loss permits us to place the impact of opportunism in the context of the other main type of risk a commercial creditor faces: the risk of loss because the debtor suffers a downturn that causes it to fall insolvent. Positive percentages mean that the contract increases Unsecured Creditor's expected losses, and thus transfers wealth away from him.

The diagonal line in Figure Two shows the expected wealth transfer caused by the contingent liability contract at each possible correlation level.²⁰ As predicted, the transfer away from Unsecured Creditor increases with the correlation. For example, when the correlation is -0.1 (the lowest possible correlation given the assumptions used for Figure Two²¹), the contract confers a windfall on Unsecured Creditor, reducing his expected losses by 6%.²² But fortunes turn against Unsecured Creditor when the internal correlation becomes positive. And at a perfect correlation (1.0), the contract transfers enough wealth away from him to increase his expected losses by 57%.²³ The beneficiaries of this wealth transfer are Shareholders, who pocket the premium 90% of

insolvent, which in Figure Two is the same as the risk that it suffers a downturn. The variable is set at 0 when insolvency does not occur, and 1 when it does. The expected value of each is 0.1 due to the assumption that each risk has a 10% probability. The value on the x-axis is obtained by calculating the correlation between the two variables at each possible distribution of probabilities across the model's four outcomes. There is a one-to-one relationship between each value for the correlation coefficient and each possible distribution of probabilities. For example, when Figure One's upper left outcome is 81% probable, its lower right 1% probable, and its upper right and lower left outcomes each 9% probable, the correlation is zero. As the lower right and upper left outcomes become more probable, the correlation rises.

¹⁹ The baseline loss is \$2.50. This is because Debtor's assets lose 40% of their value in a downturn, depreciating from \$125 to \$75, and thus leaving Unsecured Creditor with a \$25 deficiency on his \$100 claim. This deficiency is then multiplied by the 10% chance of a downturn to get the baseline loss. The general formula for this amount, assuming $dA < D$, is:

$$(3) R = [p(l) + p(lr)] * [dA - D].$$

²⁰ As described in note 18, *supra*, each value for the correlation coefficient in Figure Two corresponds to one discrete set of probabilities for the simple model's four possible outcomes. The figure's diagonal line is created by plugging the probabilities at each correlation level into equations (1) and (2) in note 17, *supra*, and then dividing T by R as calculated by equation (3) in note 19, *supra*.

²¹ A correlation coefficient of 1.0 means that, in terms of Figure One, only the upper left and lower right outcomes can occur, with the probability of the upper left being 90%, and of the lower right being 10%. The opposite extreme, meaning a correlation coefficient of -1.0, would require that only the upper right and lower left outcomes could occur, which is impossible given the assumptions that the triggering event and the downturn are each 10% likely. Rather, the lowest possible correlation occurs when the upper right outcome is 10% probable, the lower left is 10% probable, and the upper left is 80% probable, yielding a correlation coefficient of -0.11.

²² The raw amount of the wealth transfer at this correlation level is \$0.15.

²³ Or -\$1.43 in nominal terms.

the time, but when the correlation is perfect bear none of the downside risk from the contingent liability at all.²⁴

Figure Two also has a dashed horizontal line, which represents the expected wealth transfer under the alternative assumption that Debtor's \$25 obligation to Claimant is fixed rather than contingent—meaning that the “risk” of its being triggered is 100%. Strictly speaking, the internal correlation on a claim that is 100% likely to be triggered is indeterminate; I nonetheless depict the result as a horizontal line in Figure Two to permit comparison with the impact of a contingent liability for the same face amount at each internal correlation level. As the figure indicates, a \$25 fixed liability would capture enough expected wealth from Unsecured Creditor to increase his expected losses by 13%.²⁵ This is the well-known effect of leverage—the fact that an increase in a firm's debt-equity ratio transfers value from the firm's creditors to its shareholders.²⁶

Comparing the two lines in Figure Two reveals that the contingent liability has the potential to capture several times more wealth from Unsecured Creditor than the fixed liability does, even though the contingent liability is ten times less likely to come due. Indeed, when the internal correlation is perfect, the transfer produced by the contingent liability is more than four times as large. To be sure, this particular ratio is a product of the numerical assumptions I made earlier.²⁷ Nonetheless, across the full range of numerical assumptions that are consistent with the model's general structure, a perfectly correlated contingent liability always takes more wealth from Unsecured Creditor than does a fixed liability with the same face value.²⁸ And in almost all situations it takes at least twice as much.²⁹

²⁴ At a perfect correlation, Claimant pays a premium of \$1.52, which equals her expected recovery from Debtor. Claimant thus by assumption breaks even in expected value terms. Shareholders pocket this premium 90% of the time, for an expected gain of \$1.37. In nominal terms this amount is six cents less than the transfer away from Unsecured Creditor, with the difference attributable to the destruction of premium value that occurs when Debtor suffers a downturn.

²⁵ This result is calculated using equations (1) and (2) in note 17, *supra*, and assuming that $p(ur)$ is 90% and $p(lr)$ is 10%, and therefore that that the probability of the triggering event is 100%.

²⁶ See note 15, *supra*.

²⁷ For example, the ratio between the wealth transfer amounts would fall from 4.3 to 3.7 if I assumed that Debtor's assets lost 90% of their value in a downturn rather than 40%. This is because a deeper devaluation destroys more Debtor wealth when the premium is larger, and a fixed liability fetches a larger premium than a contingent liability does. Thus, increasing the depreciation percentage raises the relative dilutive effect of the fixed liability. And the ratio would further drop to 2.5 if I also assumed that Debtor's assets started out worth \$150 rather than \$125. This is because a fixed liability harms unsecured creditors primarily by increasing the debtor's debt-equity ratio, and this effect will be relatively larger when the initial ratio is smaller. On the other hand, this ratio is completely insensitive to the face value of the liability. Thus, if we were to use the other assumptions in Figure Two but cut the face values of Claimant's fixed and contingent claims to \$10 each, or double them both to \$50, the ratio would remain 4.3.

²⁸ By the model's “general structure,” I mean the parameters that Debtor starts out solvent, an asset downturn renders it insolvent, Claimant pays a premium equal to her expected recovery on the contract, and—in this first case—the face value of the contingent liability is not greater than Debtor's equity value.

²⁹ The only way to get the wealth transfer ratio below 2.0 given the parameters of the model is to assume a much smaller initial value for the amount owed Unsecured Creditor, and thus an unusually low debt-equity ratio. And this, in turn, requires a further assumption that Debtor's assets suffer a deeper devaluation in a

The fact that the contingent liability can transfer significantly more wealth than the fixed liability is counterintuitive, which helps explain why lawmakers and scholars have paid little attention to the distinct opportunism hazard that contingent debt presents. It seems a matter of common sense that a \$25 claim which will come due with 100% certainty poses a larger dilution threat to a debtor's unsecured creditors than does a \$25 claim which will come due only 10% of the time. And yet, as Figure Two indicates, the contingent liability will transfer more wealth—typically, several times more—as long as its internal correlation is high enough.

The reason for this counterintuitive result is the face-value/premium mismatch described earlier. Thus, a rational party will be willing to pay a relatively large up-front amount for a claim that is 100% likely to come due. For example, Claimant is willing to pay a premium of \$24.29 for the \$25 fixed claim in Figure Two (with “principal” being a more accurate term than “premium” here given that the fixed claim is the equivalent of a loan). And this up-front payment largely (though, as Figure Two shows, not fully) neutralizes the fixed liability's dilutive impact on Unsecured Creditor. But no rational party would similarly pay almost \$25 for a \$25 claim with only a 10% chance of becoming payable. Rather, the premium that Claimant pays for the \$25 contingent liability analyzed in Figure Two ranges from \$1.52 to \$2.50, with the amount decreasing as the internal correlation rises. At a correlation of zero, Unsecured Creditor is ten times more likely to pocket this premium than to bear the downside burden of the contingent liability, a ratio that mostly offsets the fact that the liability's face value is more than ten times larger than the premium. But at a perfect correlation he benefits from the premium only when he also bears the full brunt of the liability, and therefore the disparity between the premium amount and the liability's face value produces a large expected transfer away from him.

As this discussion implies, the relative capacity for a contingent liability to harm a debtor's unsecured creditors actually *increases* as the triggering event becomes *less* likely, as long as the internal correlation remains high. This is because a reduction in the likelihood of the triggering event increases the disparity between the face value and the premium. Thus, if we were to assume in Figure Two that the probabilities of the downturn and the triggering event were each 1% rather than 10%, and thus that Debtor were a safer credit risk, the absolute amounts of the wealth transfers would fall. But the ratio between the transfer caused by the perfectly correlated contingent liability and the transfer caused by the fixed liability would rise.³⁰ Conversely, this ratio would fall if the probabilities were 25% each,³¹ the predictable result of the fact that a contingent liability looks more like a fixed liability as the triggering event becomes more likely.

downturn, for otherwise Debtor would not be insolvent when a downturn occurs. For example, if we assume that Unsecured Creditor is owed \$50 rather than \$100, and a downturn causes Debtor's assets to depreciate 70% rather than 40%, the wealth transfer produced by a \$25 contingent liability with a perfect internal correlation will be only 1.6 times larger than that produced by a \$25 fixed liability.

³⁰ In particular, it would increase from 4.3 to 4.9.

³¹ It would fall to 3.4.

Besides debunking the notion that a contingent liability is a relatively smaller opportunism threat, Figure Two also rebuts any possible argument that correlation is secondary to face value as a driver of the opportunism hazard a contingent liability presents. At the point in Figure Two where the correlation is zero, the contingent liability increases Unsecured Creditor's expected losses by a trivial 0.3%. This is many times smaller than the increase caused either by the contingent liability at higher correlation levels or by the fixed liability.³² The implication is that, as long as the contingent liability's face value is not greater than the debtor's initial equity value, the internal correlation entirely determines whether the liability is insidious or benign. Creditor protection rules that ignore correlation therefore will often produce results that bear no relation to the actual opportunism risk, a theme to which I will return when discussing particular legal doctrines in Part III.

A final aspect of the results in Figure Two is worth noting. The figure suggests that the internal correlation does not have to be particularly high for a contingent liability to transfer more expected wealth than a fixed liability with the same face value would. Thus, the contingent liability surpasses the fixed liability as a wealth transfer hazard at a correlation level between 0.2 and 0.4.³³ To put this correlation level in perspective, the average correlation between returns of randomly selected pairs of publicly traded stocks is approximately 0.3.³⁴ The implication is that, whenever a debtor incurs a contingent liability that is based on the performance risk of another firm—such as by writing a put option on the firm's stock—the liability already likely captures as much expected wealth from the debtor's unsecured creditors as would a fixed liability of comparable size.³⁵ If the debtor and “reference” firm are in the same industry, the internal correlation will be larger,³⁶ and hence so will the transfer. And the correlation and transfer amounts will be

³² The fact that a contingent liability with a zero internal correlation produces a relatively small wealth transfer is robust to the full range of available numerical assumptions. Thus, if we hold constant the assumption that the amount owed Claimant is \$25 but toggle all other variables, no combination of alternative assumptions that is consistent with the model's parameters causes the contingent liability with a zero internal correlation to produce an expected wealth transfer larger than \$0.06.

³³ This result is robust to a wide range of available numerical assumptions. For example, the point where the contingent liability line crosses the fixed liability line in Figure Two would remain between 0.2 and 0.4 if we assumed that Debtor's assets depreciated 90% rather than 40% in a downturn, that the initial value of those assets was \$150 rather than \$125, or that Unsecured Creditor was owed \$80 rather than \$100. An important exception to this pattern is a change in face amount. As is seen in Figure Three, doubling the face amount causes the contingent liability to transfer more expected wealth than the fixed liability does at all available correlations.

³⁴ Louis K.C. Chan et. al., *On Portfolio Optimization: Forecasting Covariances and Choosing the Right Model*, 12 REV. FIN. STUD. 937, 942 (1999). The result was obtained by randomly selecting 500 stocks from the New York and American stock exchanges for each year 1968 through 1998, and then calculating an average pairwise correlation for all sets.

³⁵ To be sure, the correlation between two companies' stock returns is not the same as the correlation between one's stock performance and the other's insolvency risk, even if the two measures of correlated risk are likely to be similar. The cited figure nonetheless suggests that the internal correlations on most contingent debt in the economy is likely to be significantly above zero.

³⁶ See Chan et. al., *supra* note 34, at 943.

greater still if the two entities are part of the same firm, such as when one member of a corporate group guarantees the debt of another.³⁷

2. Contingent Liability Big Enough To Cause Bankruptcy

What happens if a contingent liability is itself a source of internal correlation, because it is large enough to render the debtor insolvent even without an asset downturn? For example, what if the amount owed Claimant were \$50 rather than \$25, and thus were greater than Debtor's equity value?³⁸ In that case, Debtor would be insolvent in the upper right outcome in Figure One, making the label "Shareholders Harmed" no longer fully accurate. Rather, Shareholders and Unsecured Creditor would share the burden of the contingent liability in that outcome, because it would be large enough to wipe out Debtor's equity value and also cut into Unsecured Creditor's recovery. Figure Three shows the consequences for Unsecured Creditor:

Figure Three

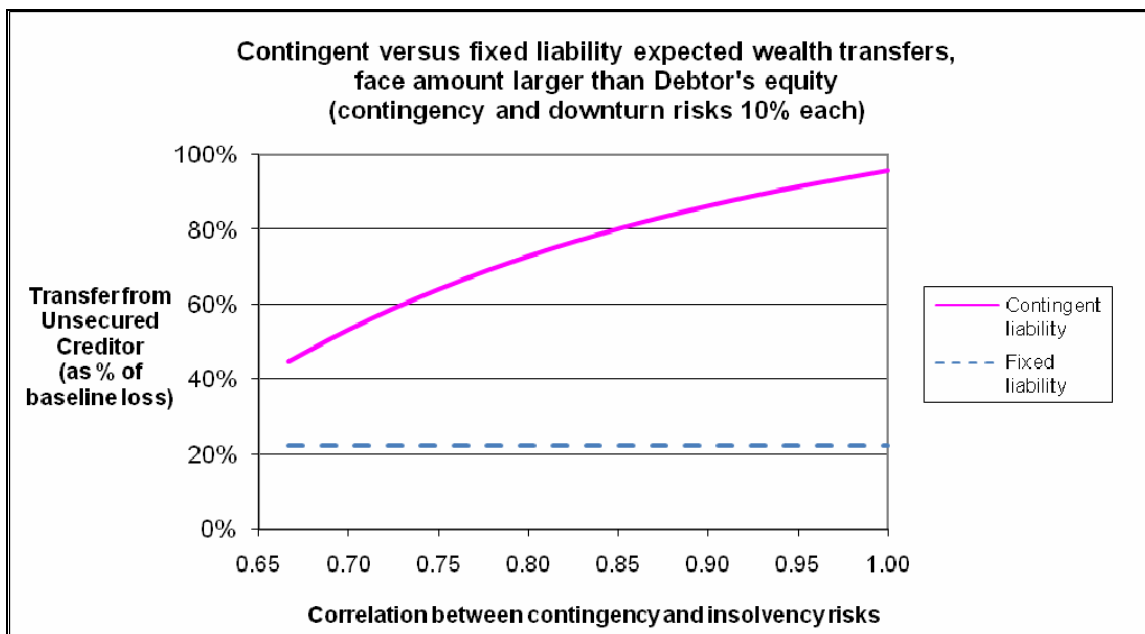


Figure Three reflects the same assumptions used for Figure Two, except that the face value of Debtor's liability to Claimant (whether contingent or fixed) is \$50 rather than \$25.³⁹ Importantly, the correlation range along the x-axis is now much narrower,

³⁷ See text at note 100, *infra*.

³⁸ Many contingent debt contracts do not specify a face value, but rather expose the debtor to a range of possible liability amounts based on the performance of the underlying "reference" risk. For example, the liability generated by a put option depends on how far the price of the reference stock drops below the strike price. If the liability range on a contingent claim straddled the amount of the debtor's equity, then the probability-weighted mean value of the liability would determine whether a graph of the expected wealth transfer relative to the correlation level looked like Figure Two or Figure Three.

³⁹ In particular, Figure Three assumes $V > A$. The formula for the premium under this assumption is:

$$P = p(ur) * [C/V] * [A+P] + p(lr) * [C/V] * d[A+P];$$

reflecting the fact that the contingent liability is sufficient in itself to render Debtor insolvent, and therefore that the internal correlation will be relatively high even when the contingency risk is negatively correlated with the risk of an asset downturn. It is still possible, however, for the internal correlation in these circumstances to be less than 1.0, because of the independent possibility that an asset downturn will render Debtor insolvent even though the contingent liability is not triggered.⁴⁰

The most notable feature of Figure Three is that the contingent liability line is everywhere higher than the fixed liability line. This is unsurprising in the sense that the contingent liability is now itself a source of internal correlation, causing Debtor to be insolvent whenever it is triggered. But the result further lays to rest the notion that contingent liabilities are the smaller opportunism hazard. The figure shows that, when a contingent liability's face value is greater than the debtor's equity value, the liability will *always* capture more expected wealth from the debtor's unsecured creditors than will a fixed liability of comparable size. Nonetheless, the fact that the line rises with the internal correlation means that, even when the contingent liability is big enough itself to break Debtor, the correlation between the contingency and downturn risks still affects the size of the wealth transfer. Indeed, as this correlation increases from its minimum to its maximum value, the wealth transfer more than doubles.⁴¹

In evaluating the opportunism hazard revealed by Figure Three, it should be noted that the wealth transfer depicted would result not only from a single contingent liability with a large face value, but also from a combination of smaller liabilities that are themselves positively correlated. For example, a firm might sell numerous put options or credit default swaps on the same underlying risk. If those liabilities were themselves small, and their triggers did not correlate with changes in the debtor's asset values, they might initially pose no opportunism hazard. But if the firm were to continue to enter into such contracts, a tipping point would be reached where the cumulative effect of the liabilities (that are themselves positively correlated) would be sufficient to bankrupt the firm even without an asset downturn. And at that point a moral hazard would arise, as the firm could enrich its shareholders by selling additional positively correlated claims even though the downside burden of those claims would be borne entirely by the firm's unsecured creditors. The fact that correlated contingent liabilities can have a cumulative impact in this fashion is a further indictment of creditor protection rules that ignore correlations in assessing the opportunism hazard a particular liability presents.

which solved for P gives:

$$(4) P = AC * [p(ur) + p(lr) * d] / [V - p(ur) * C - p(lr) * dC].$$

The formula for the wealth transfer when $V > A$ is:

$$(5) T = p(ll) * dP + p(ur) * [D * [(A+P)/V - 1] + p(lr) * [(D/V) * d[A+P] - dA].$$

⁴⁰ The correlation coefficient in Figure Three is calculated as explained in note 18, *supra*, except that now the variable that corresponds to the insolvency risk is set at 1 (representing insolvency) in each of the simple model's upper right, lower right, and lower left outcomes.

⁴¹ This ratio would fall if we further increased the contingent liability's face value.

A final point worth remembering about both Figures Two and Three is that they reflect an assumption that Claimant is unsecured. This is a realistic assumption when analyzing the impact of many traditional types of contingent debt contracts. But it is possible to secure a contingent claim, and special provisions of the Bankruptcy Code automatically give many derivative counterparties the functional equivalent of a secured claim.⁴² When a contingent claim is secured, the opportunism hazard greatly increases. For example, if we were to return to the scenario depicted in Figure Two but assume that Claimant enjoyed a prior claim on Debtor's assets rather than a pro rata claim, the wealth transfer from Unsecured Creditor caused by the fixed liability would increase by an amount equal to 27% of his baseline loss.⁴³ But the transfer caused by a perfectly correlated contingent liability would increase by 37% of the baseline loss. Scholars for some time have recognized that a secured claim poses a significant wealth transfer hazard to a debtor's unsecured creditors.⁴⁴ But previous scholarship has not recognized how the relative hazard is even greater when the secured claim is contingent rather than fixed.

C. Correlation-Seeking And The Risk-Return Tradeoff

The previous section showed that correlation-seeking makes shareholders richer. Surprisingly, it also often makes them *safer*. This stands in stark contrast to two forms of opportunism toward creditors that scholars have previously studied: higher leverage and asset substitution. Thus, when a firm substitutes debt for equity, or swaps out low-variance assets for high-variance assets, expected shareholder returns increase, but so does the volatility of those returns.⁴⁵ And higher volatility is a problem because most individuals are risk-averse. Although shareholders can try to neutralize the effect of greater volatility through diversification, this imposes transaction costs. Moreover, full diversification will not usually be an option for shareholders who wish to hold a controlling block of shares, or for managers whose compensation is largely equity-based. For these reasons, higher leverage and asset substitution both involve a tradeoff between risk and return that often will tend to make them self-limiting.

⁴² See text at note 113, *infra*.

⁴³ For a secured claim with full priority on all of Debtor's assets, the formula for the premium is:

$$(6) P = [p(ur) + p(lr)] * C.$$

Assuming that $A \geq V$, the formula for the expected transfer is:

$$(7) T = p(l) * dP + p(lr) * [dP - C].$$

Plugging the other assumptions used in Figure Two into these formulae gives an expected transfer of \$1.00 for the fixed liability, which is 40% of the baseline loss of \$2.50, computed using equation (3) in note 19, *supra*. And the expected transfer for a perfectly correlated contingent claim is \$ 2.35, or 94%.

⁴⁴ For a review of this literature, see Squire, *supra* note 11, at 863-65.

⁴⁵ See W. KLEIN, BUSINESS ORGANIZATION AND FINANCE: LEGAL AND ECONOMIC PRINCIPLES 221 (1980) (higher leverage increases volatility of equity returns); Yakov Amihud, Kenneth Garbade & Marcel Kahan, *A New Governance Structure for Corporate Bonds*, 51 STAN. L. REV. 447, 464 (1999) (an increase in equity return volatility tends to enrich shareholders at the expense of creditors); Jeffrey N. Gordon, *Deutsche Telekom, German Corporate Governance, and the Transition Costs of Capitalism*, 1998 COLUM. BUS. L. REV. 187, 95-96 (both higher leverage and asset substitution increase equity return volatility).

Correlation-seeking, by contrast, often avoids this tradeoff. To be sure, whenever a firm incurs a new liability—contingent or otherwise—the increase in leverage will cause the volatility of equity returns to rise. But if the liability is contingent, the degree to which equity volatility rises will depend on the internal correlation. And, in many situations, the increase in volatility will be smaller if the internal correlation is larger. In this sense, shareholders can capture a double benefit from an increase in the internal correlation on their firm’s contingent debt: higher expected returns, plus (assuming a given overall debt level) lower risk.

This double benefit is a feature of both of the contingent liabilities analyzed in the previous section. Thus, as the internal correlation for the contingent liability in Figure Two increases from its lowest to its highest possible level, the expected value of Shareholders’ equity increases 7%.⁴⁶ This is the effect of correlation-seeking already discussed: the fact that, as the internal correlation increases, so does the transfer from the firm’s unsecured creditors to its shareholders. However, over the same correlation range, the standard deviation of the equity value *decreases* by 24%. And this lower standard deviation means that returns on equity are less volatile.⁴⁷ In other words, risk is falling even as returns are rising. And the same is true for the contingent liability in Figure Three. As the internal correlation for that liability rises from its lowest to its highest level, the expected equity value increases 6%, while equity’s standard deviation decreases 30%.⁴⁸

Lower volatility accompanies higher returns even if we consider a third case not addressed in the previous section, where Debtor is rendered insolvent only if the contingent liability is triggered *and* an asset downturn occurs. (In terms of Figure One, this would mean that Debtor is insolvent only in the lower right outcome.) This would be true if, for example, we reverted to the assumptions used for Figure Two, but assumed that Debtor’s assets lost 15% of their value in a downturn rather than 40%. Under these assumptions, the probability of Debtor’s insolvency increases from 0% to 10% as the internal correlation rises from its lowest to its highest level.⁴⁹ This third case is thus interesting because it reflects a situation where correlation-seeking increases the risk that Debtor will fall insolvent. Despite this fact, the relationship described earlier still holds:

⁴⁶ The expected value is the sum of the values of Shareholders’ equity in each of the four possible outcomes multiplied by their probabilities. Shareholders’ equity is Debtor’s net asset value in each outcome, with the qualification that the equity value cannot be less than zero due to limited shareholder liability.

⁴⁷ Equity volatility is conventionally defined as the standard deviation of returns on equity. Because Debtor’s initial equity value is the same (\$25) regardless of the internal correlation on the contingent liability, a reduction in the standard deviation of the final equity value necessarily means a reduction in the standard deviation of the equity returns.

⁴⁸ In both cases, the relationship between higher returns and lower volatility is robust to virtually all numerical assumptions consistent with the model’s general structure. The only exceptions with respect to Figure Two involve a very low face value for the contingent claim, or very high contingency and downturn risks. There are no exceptions for the structural assumptions used for Figure Three—that is, where Debtor is solvent only if neither the contingency nor a downturn occurs.

⁴⁹ This is another way of describing the probability of Figure One’s lower right outcome across the full possible internal correlation range.

the expected equity value rises with the correlation level (by 6%), but the standard deviation falls (by 9%).⁵⁰

Why does lower risk bring higher returns in these examples, the opposite of what is seen with other forms of opportunism? Perhaps the easiest way to understand the answer is as follows. Equity volatility is a measure of the likely difference between a firm's equity value and its expected (or "mean") value. In each case just discussed, Debtor's equity value deviates relatively far from its mean value when the liability is triggered but no downturn occurs, and when the liability is not triggered but a downturn does occur.⁵¹ (In Figure One, these are the upper right and lower left outcomes.) And, as the internal correlation rises, those two outcomes become less likely. It follows that, as the correlation rises, equity volatility falls.

As this discussion implies, it is possible to adjust the numerical assumptions to cause equity volatility to increase rather than decrease with the correlation level. For example, if we were to assume in the third case that Debtor's assets lost 5% of their value in a downturn rather than 15%, equity returns and equity volatility would both rise slightly with the internal correlation. And the same would be true if we decreased the liability's face amount, or made the triggering event and the downturn more likely.

At bottom, then, the degree to which correlation-seeking will in fact increase rather than decrease equity volatility is an empirical question, as it will depend on a firm's specific debt structure, downturn risk, and other variables. The robustness of the results discussed here suggests that situations where higher correlations bring lower volatility predominate. But further research is needed to know for sure. And such research would be valuable, because it would help lawmakers further understand the scope of the correlation-seeking hazard, and to write rules that target situations where it is largest. In particular, where higher internal correlations bring lower equity volatility, correlation-seeking will be attractive even in firms with non-diversified shareholders, such as closely held firms or those in which a large proportion of managerial compensation takes the form of firm equity. The fact that equity-based compensation has become so prevalent is thus another reason to believe that the correlation-seeking hazard is especially pervasive.

D. The Social Costs Of Correlation-Seeking

So far I have depicted correlation-seeking as a zero-sum game between shareholders and creditors. But purely distributional effects are not the main reason that

⁵⁰ The formula for the premium for this example is given by equation (1) in note 17, *supra*. The only structural difference between this case and the one explored in Figure Two is that Debtor is now solvent in Figure One's lower left outcome, and this change does not affect the premium because the contingent liability is not triggered in that outcome.

⁵¹ It also is true that the deviation from the mean value is large when a downturn occurs and the liability is triggered, and this outcome (lower right in Figure One) becomes more likely as the internal correlation rises. But a higher correlation also makes the outcome where neither risk manifests (upper left) more likely, and the deviation in this outcome is low. Thus, the influences of these two outcomes on the standard deviation tend to offset, causing the change in the standard deviation to be determined by the values in the other two outcomes.

correlation-seeking is a problem. Individuals who are creditors in one setting are often shareholders in another, and so the net distributional effect of correlation-seeking across an economy may often be close to a wash. Correlation-seeking matters because it is wasteful: firms that seek to transfer wealth end up destroying wealth.

Like any other legal arrangement, a contract that creates a contingent liability generates a set of costs and benefits. Ideally, the parties to the contract would fully internalize its economic consequences, and thus would have incentive to enter into it only when doing so would on net create social wealth. But an expected transfer away from unsecured creditors acts like a thumb on the scale, increasing the perceived benefits of the contract for a reason that has nothing to do with the actual creation of economic value. As a result, contingent liabilities that produce expected wealth transfers will be overused, causing a loss of social wealth.

Perhaps the most important social cost of the overuse of contingent liabilities is overinvestment. Most contingent liability contracts—including credit default swaps, put options, and guaranties—function as insurance policies on loans and other investments. In an efficient market, an individual will make an investment only if the expected social returns exceed those that would be generated by investing the same capital elsewhere. And an insurance policy that insulates the investor from downside risk will not change this calculus as long as that risk is borne by the insurer, because then the insurer will demand a premium no smaller than the expected loss the policy protects against. But if the expected loss is borne instead by the insurer's creditors, the insurer will be willing to sell the policy at a discount, effectively splitting the opportunistic wealth transfer with the policy buyer.⁵² The result will be a misallocation of capital, because investors will purchase assets on which underpriced insurance is available rather than those that generate the highest returns when their impact on all parties is taken into account.⁵³

A second social cost of correlation-seeking is an increase in the risk that firms which engage in it will experience financial distress. Distress may become more likely because the contingent liabilities may themselves be large enough to render the firm insolvent,⁵⁴ or because an inverse relationship between asset values and liability levels

⁵² This observation implies that the calculations in Section I.B often understate expected wealth transfers by assuming a premium equal to Claimant's expected recovery on her claim rather than the expected burden of the claim on Shareholders, which will be lower whenever the internal correlation is positive, and indeed will be zero when the correlation is perfect. The extreme case—where Claimant pays no premium at all—is addressed in Figure Four in Section III.C.

⁵³ Overinvestment is also a social cost of other types of opportunism in which shareholders shift downside risk onto third parties, such as asset substitution and misuse of the secured loan. See Clifford W. Smith Jr. & Jerold B. Warner, *On Financial Contracting: An Analysis of Bond Covenants*, 7 J. FIN. ECON. 117, 118-19 (1979) (asset substitution); Bebchuk & Fried, *supra* note 9, at 899 (secured borrowing).

⁵⁴ Although correlation-seeking will usually increase the debtor's insolvency risk, the relationship is not inevitable. For example, a firm increases its insolvency risk when it incurs a contingent liability that is itself large enough to cause insolvency. However, if we hold the face value of this liability constant, asset purchases that increase the correlation between the contingency and downturn risks will actually reduce the chance of insolvency, because they reduce the likelihood of a downturn-induced insolvency as an independent event. For example, Debtor's chance of insolvency actually decreases in Figure Three as the internal correlation moves from its lowest to its highest levels.

makes it more likely that a relatively shallow asset downturn will be sufficient to drive the firm underwater.⁵⁵ Financial distress is wealth-destroying because it causes managers to scramble for short-term sources of cash instead of focusing on long-term value creation.⁵⁶ It also causes creditors to expend resources trying to liquidate their positions ahead of a bankruptcy filing.⁵⁷ Finally, firms on the brink of insolvency are more likely to undertake high-risk, socially wasteful projects, because at that point their creditors bear all the expected downside if the projects fail.⁵⁸

If firms that engage in correlation-seeking are financial intermediaries, the increased likelihood of firm-level insolvency may translate into systemic risk. The notion that the collapse of a bank or similar firm can impose system-wide costs is a central premise of the current Administration's broad new proposals for regulating the financial sector.⁵⁹ To the extent this view is accurate, the hazard is especially strong in the market for derivatives, most of which are sold by banks and other financial institutions. In settings where regulators are unwilling to let firms fail, it is thus especially important to deter correlation-seeking, as such conduct will make government bailouts much more likely.

A final set of social costs comes from the defensive efforts that creditors will take to protect themselves against opportunism. Creditors who seek to deter correlation-seeking must negotiate and enforce loan covenants that tailor the terms of lending to the risks created by the debtor's ongoing dealings with third parties. And these covenants will not be effective unless creditors monitor the debtor during the term of the loan, because contractual damages for covenant violations will be inadequate if the violations are not discovered until after the debtor has fallen insolvent and hence is judgment-proof. This is why the standard remedy for a covenant violation is acceleration of the debtor's

⁵⁵ This possibility corresponds to the third case described in Section I.C.

⁵⁶ Gregor Andrade & Steven N. Kaplan, *How Costly is Financial (Not Economic) Distress? Evidence from Highly Leveraged Transactions that Became Distressed*, 53 J. FIN. 1443, 1445-45 (1998) (financial distress destroys wealth by causing firms to liquidate assets rather than make capital expenditures); Mark J. Roe, *Bankruptcy and Debt: A New Model for Corporate Reorganization*, 83 COLUM. L. REV. 527, 538 (1983) (lost management time is one of the "heavy costs of financial distress").

⁵⁷ These costs are illustrated by the impact of collateral calls on AIG in September 2008, described in the next Part. See also Ronald J. Gilson & Charles K. Whitehead, *Deconstructing Equity: Public Ownership, Agency Costs, and Complete Capital Markets*, 108 COLUM. L. REV. 231, 250 (2008) (identifying the reluctance of various creditor groups to deal with an insolvent firm as a social cost of financial distress).

⁵⁸ See Squire, *supra* note 11, at 821 (asset substitution is more likely when a firm is insolvent); Robert K. Rasmusen, 72 WASH. U. L.Q. 1159, 1185 (1994) (same).

⁵⁹ U.S. Department of the Treasury, "Financial Regulatory Reform, A New Foundation: Rebuilding Financial Supervision and Regulation" (June 17, 2009) (*passim*) (hereafter "Treasury Report"). A possible illustration of systemic risk is the fact that the September 2008 bankruptcy of Lehman Brothers led to a run on money market funds, because one of them—the Reserve Primary Money Fund—was heavily invested in Lehman Brothers commercial paper. Daisy Maxey, *Expense Tally for Reserve Primary Since 'Breaking Buck': \$16.6 Million*, WALL ST. J., June 13, 2009, at B6. And this, in turn, temporarily caused money markets to stop buying commercial paper, which had it continued could have deprived manufacturers and other firms of a key source of short-term financing.

payment obligations rather than damages for any actual losses the violation causes.⁶⁰ As an alternative, creditors might try to protect themselves by demanding a secured claim, but that arrangement creates its own set of costs, including because it typically produces an opportunistic wealth transfer in the secured creditor's favor.⁶¹ Moreover, creditors who plan to monitor will demand higher interest rates as compensation, raising borrowing costs for all debtors and thereby producing a deadweight loss in the credit market.⁶² Importantly, such creditors will incur monitoring costs even if their debtor never in fact acts opportunistically. For this reason, a debtor's mere option to engage in correlation-seeking will destroy social wealth even creditors monitor successfully and hence no opportunism occurs.

The fact that loan covenants are usually ineffective unless creditors incur monitoring costs shows that contract law is inadequate in a situation where monetary damages alone are unlikely to provide an effective remedy. By contrast, bankruptcy's automatic stay, and its rules on voidable preferences and fraudulent conveyances, provide injunctive remedies against third parties, such as by subordinating their claims or forcing them to return assets to the debtor's estate. In other words, bankruptcy rules introduce property rights into a setting where it is not cost-effective to create optimal incentives through contractual remedies alone. This suggests that the failure of current bankruptcy law to deter correlation-seeking is especially likely to lead to a large loss of social wealth.

II. CORRELATION-SEEKING ILLUSTRATED: THE FALL OF AIG

This Part illustrates the hazards of correlation-seeking by describing an example of a firm that was driven insolvent by contingent liabilities with high internal correlations. That firm is multinational insurer AIG, whose notorious trades in financial derivatives—in particular, credit default swaps linked to subprime mortgages—are widely blamed for the company's spectacular unraveling during the September 2008 financial crisis. To many observers, AIG's collapse was the fulfillment of Warren Buffet's prophecy that derivative contracts would prove to be “financial weapons of mass destruction.”⁶³ While other clear examples of correlation-seeking are available,⁶⁴ AIG merits particular attention here because of the size of the government bailout it elicited, and because its failure is one of the primary avowed motivations for the current Administration's proposed regulations for derivatives.

The standard account of what happened at AIG—and the one reflected in the Administration's proposals—is based upon a key misperception. According to this view, a small band of derivative traders, operating outside AIG's mainline insurance

⁶⁰ F.H. Buckley, *The Bankruptcy Priority Puzzle*, 72 VA. L. REV. 1393, 1443 (1986).

⁶¹ See Bebachuk & Fried, *supra* note 9.

⁶² Squire, *supra* note 11, at 820-21.

⁶³ BERKSHIRE HATHAWAY, INC., 2002 ANNUAL LETTER TO SHAREHOLDERS 15 (2003).

⁶⁴ Another widespread form of correlation-seeking is discussed later in this section: the prevalent use by corporations of intragroup and personal shareholder guaranties. See text at note 100 *infra*.

businesses, was able to bring an otherwise sound corporate giant to its knees.⁶⁵ In fact, AIG's liabilities on its derivative contracts were not large enough in themselves to break the company. Rather, the conduct that undid AIG was a company-wide affair, in which derivative traders in the firm's Financial Products division incurred large contingent liabilities that were linked to the subprime mortgage market, and then fund managers at the AIG parent company cranked up the internal correlation on those liabilities by buying up risky mortgage-backed securities for the company's general investment portfolio. When the housing market collapsed, it was the combined damage to *both* sides of AIG's balance sheet that brought the company to the brink of bankruptcy. Without a proper understanding of the high internal correlations that toppled AIG, new rules for derivatives—and for contingent liabilities more generally—will likely fail to prevent another AIG in the future.

The derivatives that bear the popular blame for AIG's failure were credit default swaps sold by Financial Products, a separate entity within the AIG corporate group. A credit default swap is a natural product for an insurer, as such a contract is little more than an insurance policy on the performance of a debt-like instrument such as a bond. The buyer of the swap makes one or more premium payments to the seller, who in return agrees to pay the buyer a specified amount if the issuer of the debt instrument defaults. And Financial Products had a strong competitive edge in the swap business, because the AIG parent, which enjoyed a perfect AAA credit rating, had unconditionally guaranteed all of the division's obligations.⁶⁶ Counterparties were therefore willing to enter into swap contracts with Financial Products without requiring that the division "post" (set aside) cash or low-risk securities to serve as collateral.

Initially, Financial Products sold swaps only on low-risk corporate bonds.⁶⁷ However, as the housing market expanded during the early years of the current decade, the division also began selling swaps on mortgage-backed securities, which are bonds that represent claims on cash flows produced by pools of mortgages. Many such securities were issued by government-sponsored entities such as Fannie Mae and Freddie Mac (hereafter "Fannie" and "Freddie"), who assembled the underlying mortgage pools and guaranteed the performance of the securities they issued. However, Financial Products also sold swaps on securities backed by "subprime" mortgages that were too risky for Fannie and Freddie to be willing to underwrite, and thus were pooled by purely private firms.

A few years after Financial Products entered the mortgage-linked swap business, AIG became the target of an investigation by the New York Attorney General into allegations of inflated earnings.⁶⁸ The fallout from this investigation led the rating

⁶⁵ See, e.g., Brady Dennis & Robert O'Harrow Jr., *A Crack in the System*, WASH. POST, Dec. 30, 2008, at A01 (blaming fall of AIG entirely on its derivatives sales); Housman B. Shadab, *Guilty by Association? Regulating Credit Default Swaps*, ENTREP. BUS. L.J. 6, 21 (forthcoming Fall 2009) ("AIGFP's excessive risk taking...was sufficient by itself to cause of the collapse of AIG"). At mercatus.org/PublicationDetails.aspx?id=26712.

⁶⁶ AIG Form 10-K 2007 at 179.

⁶⁷ Brady Dennis & Robert O'Harrow Jr., *A Crack in the System*, WASH. POST, Dec. 30, 2008, at A01.

⁶⁸ *Id.*

agencies to downgrade AIG to AA in June 2005.⁶⁹ This downgrade deprived Financial Products of its competitive advantage in the swap business, because now the division had to post collateral on its derivative contracts.⁷⁰ Unsurprisingly, the division's managers later that year decided to stop selling credit default swaps—although, portentously, they did not also unwind the positions the division had already assumed.⁷¹

By the time it exited the swap-selling business, AIG was deeply exposed to the housing market, with a total notional amount on its subprime-linked swaps of \$60 billion.⁷² Moreover, the company derived no diversification benefit from the large number of swaps it had sold, because the contingent liabilities from the individual contracts were highly correlated with each other. This was due to the fact that Financial Products had sold swaps almost exclusively on securities that represented the senior tiers of the underlying mortgage pools.⁷³ Those pools were structured to pay senior tiers first in case the mortgages underperformed, which meant that junior tiers would absorb essentially all idiosyncratic (that is, borrower-specific) and regional risk associated with the mortgages in the pools.⁷⁴ For this reason, the senior tiers were considered the least risky, and regularly received AAA scores from the rating agencies.⁷⁵ However, as the rating agencies themselves understood, there was one event that could trigger deep losses on the senior tiers: a sustained, multi-region drop in housing prices.⁷⁶ For this reason, the only event that could trigger a large claim on any particular subprime-linked swap contract—that is, a general drop in housing prices—would also cause large claims on the other contracts to be triggered at the same time.

But despite the concentrated nature of AIG's exposure to the housing market through its subprime-linked swaps, that exposure alone almost certainly would not have been enough to bankrupt the company. This is because liability for the full \$60 billion notional amount was always extremely unlikely, as such would require that the underlying houses prove to be completely worthless rather than just badly overpriced. By comparison, AIG's overall equity value at the end of 2005 (when it ceased swap sales)

⁶⁹ This particular rating is from Standard & Poor's; Fitch and Moody's also downgraded AIG during the same period. AIG Form 10-K 2005 at 14.

⁷⁰ AIG Form 10-K 2005 at 15.

⁷¹ AIG insiders have told reporters that Financial Products stopped selling credit default swaps in 2005 because executives were concerned about the company's concentrated exposure by that point to the subprime housing market. *See, e.g.,* Michael Lewis, *The Man Who Crashed the World*, VANITY FAIR, Aug. 2009. This explanation is contradicted by the fact executives permitted the fund managers of the AIG parent to make heavy purchases of subprime mortgages in 2006 and 2007.

⁷² This figure is from 2007. AIG Form 10-K 2007 at 122. AIG did not disclose its notional swap exposure for 2005. However, the figure is unlikely to have changed significantly in the interim given that the company stopped selling swaps in 2005 but did not unwind the positions it had already incurred.

⁷³ AIG Form 10-K 2007 at 122.

⁷⁴ Joshua D. Coval et. al., *The Economics of Structured Finance* 6 (Harvard Bus. School, Working Paper No. 09-060, 2008). At <http://www.hbs.edu/research/pdf/09-060.pdf>.

⁷⁵ *Id.* at 3-4.

⁷⁶ *See id.* at 20.

was \$86 billion.⁷⁷ In other words, AIG was in the position represented by Figure Two rather than Figure Three, and it could have contained the downside risk from its swap contracts had it acquired assets that were unlikely to depreciate at the same time the swaps were triggered.

Rather, however, than hedge itself on the asset side of its ledger, AIG doubled down. Thus, just as Financial Products was winding down swap sales in 2005, the fund managers of the AIG parent were embarked upon a campaign of buying up mortgage-backed securities for the company's own investment portfolio. This buying spree accelerated in 2006, and did not end until 2007, at which point the portfolio held \$45 billion in subprime mortgage-backed securities—more than a tenfold increase from the level three years earlier.⁷⁸ And by that point another \$16 billion in subprime securities had been purchased directly by Financial Products, raising the company-wide total to \$61 billion.⁷⁹ More than 90% of these securities represented the senior tiers of the underlying mortgage pools,⁸⁰ and thus matched exactly the risk from the company's swap positions. Finally, AIG at the end of 2007 owned another \$48 billion in mortgage-backed securities which, though not considered “subprime,” were also not guaranteed by Fannie and Freddie, and thus were highly vulnerable to a real estate downturn.⁸¹ Therefore, the company's total exposure to the at-risk portion of the mortgage market at the end of 2007, including both the company's swap exposure and its holdings of non-guaranteed mortgage-backed securities, was \$169 billion, as compared with a company equity value of \$96 billion.⁸² When the market for mortgage-backed securities collapsed in September 2008, this exposure was more than enough to render the company insolvent.⁸³

The series of decisions by which AIG tied its fate to the mortgage market contradicts the standard model of the insurance business, in which insurers are supposed to hedge the risks from the policies they sell by investing the premiums in safe assets.

⁷⁷ AIG Form 10-K 2005 at 24.

⁷⁸ In 2007 AIG (other than Financial Products) held \$3.7 billion in subprime mortgages of pre-2005 vintage. AIG Form 10-K 2007 at 105 (includes securities classified by company as both “Alt-A” and “subprime,” both categories being subprime in the sense that neither was guaranteed by government-sponsored entities such as Fannie or Freddie). Adding in the 2005-2007 vintage holdings produces a total of \$44.9 billion. Assuming that all of the pre-2005 vintage holdings were purchased before 2005, this marks a twelvefold increase. If some of these earlier vintages were purchased during the reference period, the ratio would be even higher.

⁷⁹ *Id.* at 104.

⁸⁰ *Id.* at 105.

⁸¹ These were \$25 billion in “prime” but nonetheless non-guaranteed residential mortgage-backed securities, plus \$23 billion in commercial mortgage-backed securities. *Id.* at 104. Along with AIG's subprime investments, these assets lost value in 2007, a trend that accelerated in 2008. *Id.* at 161.

⁸² *Id.* at 131.

⁸³ AIG reported losses in 2008 of \$99 billion. AIG Form 10-K 2008 at 36. As noted before, its equity value at the end of 2007 was \$96 billion. And another \$5 billion in losses were recorded for the first quarter of 2009. AIG Form 10-Q 1Q2009 at 5. These reported losses almost certainly understate the actual damage to the company's intrinsic value as a result of the collapse of the housing market, because they include economic benefits of the federal bailout.

But the decisions make perfect sense if the goal was to maximize shareholders returns. Thus, AIG first used its AAA rating to earn high premiums from sales of swaps linked to subprime mortgages. And then, after the loss of that rating brought swap sales to an end, the company cranked up the internal correlations on the contingent liabilities from those swaps by purchasing large amounts of risky mortgage-backed securities for its investment portfolio. Those securities were likely to lose value only in a situation where liability on the swaps was triggered. Therefore, by reallocating such a large amount of its investment portfolio into mortgage-backed securities, AIG shifted the upside gains on that portfolio toward shareholders, and shifted the downside risk from the swap positions toward the company's creditors. Although such conduct made AIG's insolvency more likely, it nonetheless increased the expected value of the company to its shareholders.

Who exactly were the creditors who stood to lose from the high internal correlations on AIG's swap positions? Importantly, the answer is not—or at least not primarily—the swap counterparties themselves. This is because of special Bankruptcy Code provisions that exempt derivative counterparties from the Code's automatic stay and from its prohibitions on fraudulent conveyances, preferences, and ipso facto clauses.⁸⁴ Those exemptions meant that AIG's counterparties could have foreclosed on collateral after AIG filed for bankruptcy, even if AIG had posted that collateral while insolvent. These counterparties were thus secured to the extent of their collateral, as there was no risk that they would have to share that collateral with AIG's general creditors. Therefore, these counterparties always stood to recover a much higher percentage on their claims if AIG fell bankrupt than did AIG's typical unsecured creditor.⁸⁵

Rather, two other groups of unsecured creditors bore most of the expected burden of AIG's swap liabilities. The group most directly imperiled was the general (that is, non-derivative) creditors of Financial Products and of the AIG parent, which as previously noted had guaranteed all Financial Products obligations.⁸⁶ And a second, even larger group whose interests were impaired was the multitude of policyholders who had bought AIG's garden variety insurance and annuity products.⁸⁷ These policyholders

⁸⁴ 11 U.S.C. §§ 362(b)(6)-(7), (17), 546(e)-(g), 555, 556, 559, 560 (2006); *see also* Edward R. Morrison & Joerg Riegel, *Financial Contracts and the New Bankruptcy Code: Insulating Markets from Bankrupt Debtors and Bankruptcy Judges*, 13 AM. BANKR. INST. L. REV. 641, 651 (2005) (amendments in 2005 to the Code's definition of "swap agreement" widened the exemptions to cover essentially all derivatives). To be precise, counterparties are exempt only from the provisions relating to "constructive" fraudulent conveyances, not from those directed at intentional fraud. 11 U.S.C. § 546 (e)-(g), cross-referencing 11 U.S.C. § 548(a)(1)(A).

⁸⁵ Although AIG eventually ran out of collateral when its credit rating was again downgraded in September 2008, the amount it was able to post before it received its first bailout loan covered most of the losses on the counterparties' underlying securities. Thus, by August 31, 2008, AIG had posted \$22 billion to its swap counterparties, almost all of which went to those who had purchased default protection on subprime securities. AIG Form 10-K 2008 at 3, 146. Continuing deterioration in the value of AIG's own mortgage-backed assets led the rating agencies again to downgrade AIG on September 15, 2008, which in turn led to further collateral calls of approximately \$11 billion. *Id.* at 146. AIG was unable to meet these collateral calls in full until it received a loan from the New York Fed on September 22. *Id.* at 5.

⁸⁶ These unsecured creditors were owed \$108 billion at the end of 2007. AIG Form 10-K 2007 at 89.

⁸⁷ AIG owed these policyholders more than \$420 billion in 2007. *Id.* at 131.

were supposed to be protected by state laws requiring insurers to set aside “regulated assets” that are used to pay policyholder claims first in case of bankruptcy. But AIG managed to skirt these laws through its “securities lending program,” whereby it lent regulated assets such as stocks to third parties in exchange for cash collateral, and then used that cash to buy mortgage-backed securities.⁸⁸ When the market for these securities collapsed, AIG ended up owing these third parties more than \$40 billion,⁸⁹ a deficit the AIG parent could not cover due to the simultaneous triggering of collateral calls on the swap contracts.

Of course, AIG’s various unsecured creditors did not ultimately bear the impact of the company’s decision to go “double long” on the housing market. In a series of bailout measures that began in September 2008 and have continued through June 2009, the federal government has put \$129 billion at risk to keep AIG out of bankruptcy.⁹⁰ Because of these measures, the wealth transfer produced by the high internal correlations on AIG’s swap positions has been suffered not by AIG’s own creditors, but rather by another large group of unsecured “creditors”: U.S. taxpayers. To the extent a bailout was foreseeable, it only would have exacerbated the opportunism hazard by undermining the incentive for AIG’s creditors to monitor to protect themselves.

The opportunism story told here might seem to be in tension with media reports suggesting that AIG’s managers thought that fears of a housing bubble were overblown, and therefore that the probability of large-scale liability on the company’s derivative positions was remote.⁹¹ But it must be remembered that the relevant question for opportunism purposes is not whether a debtor’s managers think that a contingent liability is particularly likely to come due. To the contrary, as was noted in Part I, the wealth transfer produced by a contingent liability relative to that of a fixed liability *increases* as the contingency becomes less likely, as long as the internal correlation remains high. Rather, the relevant question is whether the managers believe that, if the triggering event (however unlikely) does occur, the debtor will also probably be insolvent, from asset depreciation or otherwise. And there can be little doubt that reasonable observers would have understood that the risk from AIG’s mortgage-linked swaps was highly correlated with the risk that the company’s own mortgage-backed securities would lose value. Indeed, the fact that AIG had matched the specific risk type across its balance sheet—on both sides, exposing itself only to the senior tiers of the underlying mortgage pools—would have made the correlation all the more evident.

⁸⁸ AIG Form 10-K 2008 at 166. At the end of 2007, AIG’s outstanding obligations under this program were \$75 billion, two-thirds of the proceeds of which were invested in subprime assets. AIG Form 10-K 2007 at 108.

⁸⁹ Press release, AIG, AIG Discloses Counterparties to CDS, GIA, and Securities Lending Transactions, (March 15, 2009).

⁹⁰ The first bailout consisted of an \$85 billion secured loan, most of which has been converted to preferred and common stock given AIG’s insolvency and thus inability to service its long-term debt. AIG 2008 Form 10-K at 276. Another \$44 billion has been spent buying mortgage-backed securities from AIG and its swap counterparties. *Id.* at 250-51.

⁹¹ See, e.g., Robert O’Harrow, Jr. and Brady Dennis, *Downgrades and Downfall*, WASH POST, Dec. 31, 2008, at A01.

More broadly, there is evidence that a well-understood process of correlation-seeking was at the heart of AIG's swap business even before that business became entangled with the mortgage market. When Financial Products first began selling swaps on low-risk corporate bonds, the division's computer models predicted that liability would be triggered only by a "full-blown depression."⁹² As a result, the division's managers concluded that the premiums from these early swap sales were "free money."⁹³ The basis for this conclusion would not have been the one the managers later gave to newspaper reporters—namely that, in case of a general depression, "the holders of the swaps would almost certainly be wiped out, so how could they even collect?"⁹⁴ A bankrupt firm can still sue to enforce its contracts, a fact that these sophisticated managers would have understood. Rather, the more accurate statement is that, in case of a severe depression, *AIG* would probably be wiped out, because the company's investment portfolio was tied to the performance of the general economy. Those swaps on corporate bonds were, therefore, contingent debts that the company's shareholders—as opposed to its general creditors—would almost certainly never be called upon to pay.

As it turned out, the company's mortgage-linked swaps—as contrasted with the earlier, corporate bond-linked swaps—were in fact triggered in an economic downturn that some have compared to a depression.⁹⁵ This does not mean, however, that AIG's concentrated bets on the housing market only make sense if its managers anticipated such a tight link between the housing market and the performance of the broader economy. To the contrary, the heavy purchases of mortgage-backed securities from 2005 to 2007 are more consistent with a belief that the downside risk on the mortgage-linked swaps was sector-specific, as contrasted with the downside risk from the earlier, bond-linked swaps. Nonetheless, both examples suggest that the opportunism hazard may be highest on contingent liabilities that represent what might be called "end of the world insurance"—that is, insurance against the risk of an usually broad economic downturn. This is because such an event is also the type that is most likely to cause a deep downturn in the value of the insurer's assets.

While AIG's credit default swap sales are especially notorious, it is highly unlikely that the insurer is the only firm to have used derivatives to create contingent debts with high internal correlations.⁹⁶ A provocative observation in this regard is that approximately 80% of credit default swaps are purchased by parties who—unlike most of AIG's counterparties—do not own the underlying "reference" asset.⁹⁷ Such buyers therefore are not typically seeking protection against downside risk, but rather are acting

⁹² Brady Dennis & Robert O'Harrow Jr., *A Crack in the System*, WASH. POST, Dec. 30, 2008, at A01.

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ See, e.g., RICHARD A. POSNER, *A FAILURE OF CAPITALISM: THE CRISIS OF '08 AND THE DESCENT INTO DEPRESSION* (2009).

⁹⁶ Indeed, the company sold less than 1% of the credit default swaps issued in the past decade. Shadab, *supra* note 65, at 6, 21.

⁹⁷ Dawn Kopecki & Shannon D. Harrington, *Banning 'Naked' Default Swaps May Raise Corporate Funding Costs*, BLOOMBERG, July 24, 2009.

on a belief that the swaps are underpriced relative to the expected value of future payouts. And correlation-seeking is a reason that sustained underpricing would occur, because sales are then subsidized by expected wealth transfers from the sellers' unsecured creditors. In other words, correlation-seeking makes it rational for both buyer and seller to enter into a contract whose premium is less than the contract's expected payout.

A final piece of the AIG story worth emphasizing is the key role played by an "intragroup" guaranty, by which I mean the guaranty the parent company gave on the obligations of its Financial Products subsidiary. The fact that such a guaranty was an essential part of the firm's financial structure is unsurprising, as guaranties between affiliated entities have become a nearly ubiquitous feature of the consolidated corporate group.⁹⁸ This Article's thesis helps explain why. The fortunes of a guarantor and a borrower will be highly correlated if both entities contribute to the production of the same outputs, or (as in the case of a "downstream" guaranty) if one entity holds a large equity stake in the other. Therefore, the contingent liabilities created by intragroup guaranties will almost invariably have high internal correlations, and for this reason will produce large expected wealth transfers from the guarantor's unsecured creditors. And the same will be true of the personal shareholder guaranties that the large majority of closely held corporations use to reduce the interest rates they pay to their most important lenders.⁹⁹ In such cases, the controlling shareholder's stock in the corporation likely constitutes a large portion of the shareholder's total personal wealth, and so the same real assets will be driving the fortunes of both borrower and guarantor.

Besides ensuring a high internal correlation, the fact that the assets of a borrower and guarantor are under common control will likely have other economic consequences. For example, a guaranty in that situation may increase the guarantor's incentive to monitor the borrower, yielding potential efficiencies. Conversely, the social costs of opportunism in such contexts might go beyond those discussed in Section I.C. For these reasons, and also because an extensive literature on these arrangements already exists, common control guaranties deserve a more thorough treatment than can be provided here.¹⁰⁰ Nonetheless, they serve as a useful reminder that the hazard of correlation-seeking goes well beyond financial derivatives, and that a comprehensive legal response must do so as well.

III. RECONCEPTUALIZING THE LAW OF CONTINGENT DEBT

Despite the pervasiveness of the correlation-seeking hazard, lawmakers have entirely ignored it. Thus, legal measures meant to prevent misuse of contingent debt take no account of correlations, and instead regulate under principles designed to deter misuse of fixed debt. For this reason, such measures focus primarily on a contingent liability's face amount, even though—as Section I.B established—this variable in itself often bears

⁹⁸ See Phillip I. Blumberg, *Intragroup (Upstream, Cross-Stream, and Downstream) Guaranties Under the Uniform Fraudulent Transfer Act*, 9 CARDOZO L. REV. 685 (1987).

⁹⁹ See Douglas Baird & Edward R. Morrison, *Serial Entrepreneurs and Small Business Bankruptcies*, 105 COLUM. L. REV. 8 (Table 17) (2005).

¹⁰⁰ I offer such a treatment in "The Abuse and Reform of the Common Control Guaranty" (working paper).

almost no relationship to the question whether the liability is likely to generate social costs. This Part considers in greater detail two examples of such measures: the current Administration's proposed approach to regulating derivative contracts, and fraudulent conveyance law. In both cases, if the measures are to achieve their intended purpose of deterring opportunism, then lawmakers will need to reconceptualize the contingent debt problem as one of correlations rather than face amounts.

A. Correlation And The Regulation Of Derivatives

In the wake of the financial crisis and the unprecedented bailouts it precipitated, the Administration has proposed a broad regime for the federal regulation of derivative contracts. This regulatory vision is laid out in a June 2009 Treasury Department report, which has been translated into draft legislation that is now before Congress.¹⁰¹ Conspicuously, nothing in that report takes any account of matters of correlation.¹⁰² This is despite the fact that the report specifically cites "excessive risk taking" by AIG as one of the primary causes of the financial crisis.¹⁰³ However, according to the report, AIG failed not because of high internal correlations, but rather because the company was "overwhelmed" by the "sheer volume" of credit default swaps it had sold.¹⁰⁴ In this way, the report adopts the conventional story on AIG, and thus reflects a belief that the most important measure of the level of systemic risk posed by a firm's derivative contracts is their total notional amount.¹⁰⁵ Unsurprisingly, the Administration's reforms that would have the greatest practical impact are standard regulatory responses to a perceived problem of excess leverage.

The most important of these reforms would be higher minimum capital requirements for all derivative counterparties, meaning that counterparties would face stricter limits in their ability to finance operations with debt rather than equity.¹⁰⁶ The clear downside of this proposal is that it would raise financing costs for all derivative users. Whether it offers much in terms of offsetting benefits is less clear. To be sure, a decrease in a firm's debt-equity ratio will marginally reduce the firm's ability to enrich its shareholders through correlation-seeking, because it will make the firm's insolvency less likely. But to attack correlation-seeking through higher capital requirements is to come at the problem obliquely, as such requirements would burden even those firms whose derivative-based liabilities lack positive internal correlations and thus do not

¹⁰¹ Sarah N. Lynch, *Treasury Sends Draft Derivatives Bill to Congress*, WALL ST. J., Aug. 11, 2009.

¹⁰² Indeed, no variation on the word "correlation" appears in the 88-page report. A promising note is sounded in a section on the insurance sector, which also names AIG, and cites a need for "an appropriate match between capital allocation and liabilities." Treasury Report, *supra* note 59, at 40. Closer inspection, however, reveals that this language is not about correlations, but rather about temporal mismatches between short-term liabilities and long-term assets, i.e., "the management of liquidity and duration risk." *Id.*

¹⁰³ *Id.* at 47.

¹⁰⁴ *Id.*

¹⁰⁵ In this way, the section on derivatives is analytically no different from the report's earlier sections that blame the collapse of large bank holding companies on problems of "excess leverage." *Id.* at 29.

¹⁰⁶ *Id.* at 48.

meaningfully increase insolvency risk or otherwise present an opportunism hazard. In other words, the proposal would raise the costs of derivative products across the board, rather than targeting those that are likely to generate meaningful negative externalities.

Another prominent component of the proposed regulatory regime is stricter margin requirements, to be enforced primarily by new derivative exchanges and clearinghouses.¹⁰⁷ Higher margin requirements would mean that counterparties would have to post more upfront collateral on their contracts. The emphasis on margin requirements betrays a view that the financial crisis was primarily one of illiquidity—for example, that AIG would not have needed a bailout if it had originally posted a little more collateral on its swap contracts.¹⁰⁸ In fact, AIG was not merely illiquid but insolvent, with losses in 2008 that exceeded its 2007 value despite the windfall the company received from the bailout measures.¹⁰⁹ Thus, more collateral for AIG’s counterparties would simply have meant bigger losses for its other creditors had the company been allowed to enter bankruptcy.¹¹⁰

A more fundamental problem with higher margin requirements is that they would further undermine the incentive for counterparties to monitor each other. As I noted previously, the special exemptions that derivative counterparties now enjoy under the Bankruptcy Code put them in a position analogous to that of a secured creditor, because they enjoy priority over the debtor’s other creditors to the extent of the posted collateral. And this priority reduces the counterparties’ incentive to monitor each other, because it shifts the expected losses from correlation-seeking onto other unsecured creditors. This disincentive is especially perverse given that derivative counterparties are more sophisticated than the typical unsecured creditor, and thus better able to monitor to prevent opportunism. However, to the extent that counterparties start out undersecured, with the expectation that more collateral may have to be posted during the life of the contract, they have some incentive to monitor each other to ensure that collateral is made available as risk levels increase. It follows that margin requirements which force counterparties to post more collateral up front will further reduce their incentive to monitor after the contract is signed.¹¹¹

¹⁰⁷ Parties would be required to trade only “standardized” contracts on exchanges. Customized contracts could still be traded privately, although collateral requirements might apply to these as well. *Id.* at 48.

¹⁰⁸ I am assuming that higher margin requirements are not intended as another device for reducing each counterparty’s debt-equity ratio—that is, as another de facto capitalization requirement. I base this assumption on the proposed reliance on clearinghouses, which generally serve to reduce the amount of collateral that parties need to post on margin while maintaining the same overall risk level. *See Credit Default Swaps, Clearinghouses, and Exchanges* 3 (Council on Foreign Relations, Working Paper, July 2009). At <http://www.cfr.org/publication/19756>.

¹⁰⁹ *See* note 83, *supra*.

¹¹⁰ More generally, financial intermediaries are thought to create systemic risk because they tend to be deeply interconnected, with multiple debt obligations and other contractual arrangements among them. It thus may be unrealistic to think that the damage caused by the failure of such a firm to the broader financial system could be stemmed merely by shifting around losses among the firm’s contractual positions.

¹¹¹ The report also identifies a need for new “business conduct standards,” although the content of these is unspecified. *See* Treasury Report, *supra* note 59, at 47-49.

Rather than further insulate counterparties from the consequences of opportunism, lawmakers should increase their exposure by repealing the special bankruptcy exemptions they now enjoy.¹¹² Franklin Edwards and Edward Morrison have previously criticized those exemptions on grounds that they are ill-suited to their ostensible purpose, which is the reduction of systemic risk.¹¹³ The events of 2008 corroborate their assessment. In addition, the exemptions exacerbate the opportunism hazard presented by derivatives with high internal correlations, because—as was noted in Section I.B—the expected wealth transfer increases when the claimant enjoys priority over the debtor’s other creditors. Reinstating bankruptcy’s automatic stay and its prohibitions on preferences and ipso facto clauses would relegate derivative counterparties to the status of general unsecured creditors, thus shrinking expected wealth transfers. And eliminating their priority would also make counterparties more vulnerable to correlation-seeking, thereby encouraging them to monitor to prevent it. For example, if AIG’s sophisticated swap counterparties had been more exposed to the risk that AIG would fall insolvent, they might have tried to prevent the company from reallocating so much of its investment portfolio into risky mortgage-backed assets.¹¹⁴

Despite, however, the benefits of shifting the consequences of opportunism onto those creditors who are best able to prevent it, creditor monitoring is unlikely in itself to provide optimal levels of deterrence. This is because of the collective action problems among creditors mentioned in Section I.A, and because of the inherent limitations of contractual remedies as a check on debtor opportunism. Therefore, lawmakers should consider additional measures to serve as a complement to creditor monitoring. One possibility would be the reform of common-law creditor protection doctrines—in particular, fraudulent conveyance law—to make them better for preventing misuse of contingent liabilities, including those created by derivatives. I discuss this possibility in greater detail in Section III.B, below. And a second possibility, which bears more specifically on the regulations proposed by the Administration, would be for lawmakers to adopt rules that target correlation-seeking directly, at least in financial intermediaries whose failure might create systemic risk.

¹¹² See note 84, *supra*.

¹¹³ Franklin R. Edwards & Edward R. Morrison, *Derivatives and the Bankruptcy Code: Why the Special Treatment?*, 22 YALE J. ON REG. 91 (2005).

¹¹⁴ The Administration has also called for heightened counterparty reporting requirements, even though it is not clear that a lack of relevant information was a primary cause of the financial crisis. Treasury Report, *supra* note 59, at 47. For example, AIG in its 2007 annual report made extensive disclosures about its swap positions and about the type, face value, vintage, and credit rating of all mortgage-backed securities in its investment portfolio. But insurance regulators did nothing to force the company to unwind its exposure to the housing market before the crisis. And it was similarly well known that Wall Street investment banks had made deep investments in subprime securities. Thus, the financial crisis seems to have been caused not primarily by a lack of needed information, but rather by a lack of motivation among the parties with access to the information to take action. Nonetheless, to the extent that new disclosure requirements are to be adopted, they would be most useful if they focused on information about the correlations between the liability triggers on a firm’s derivative positions and the other risks the firm bears. Besides assisting regulators, greater public access to such information might help reduce creditor monitoring costs.

To make rules of this type effective, lawmakers would have to reconceptualize the contingent liability problem as one of correlations rather than notional amounts. For example, financial intermediaries should be limited in their ability to incur sector-specific risks, taking into consideration not only the nature of their assets but also the liability triggers on their contingent liabilities. Importantly, this would mean the mere fact that a firm owned mostly AAA-rated assets would be insufficient to establish compliance. As AIG illustrated, a portfolio full of AAA risks still presents a large opportunism hazard if the firm gets no diversification benefit from those risks due to high internal correlations. To backstop such limits, regulators might also require rating agencies to provide risk assessments that reflect not only the probability that an individual debt instrument will default, but also the instrument's diversification value—that is, the correlation between the instrument's default risk and the risks on other important categories of investment products. Such ratings would enable creditors to write loan covenants that refer to publicly available measures of diversification, thereby creating a cheap mechanism for enforcing contractual limitations on a firm's internal correlation levels.

Another measure that regulators should consider is bright-line rules that cap the ability of firms to incur contingent liabilities that constitute “end of the world” insurance—that is, liabilities likely to be triggered only by the type of severe economic downturn that impairs multiple asset classes. Because such risks cannot be hedged, they are highly unlikely to be borne by shareholders of firms with meaningful debt levels, and thus create large expected wealth transfers from unsecured creditors. A prominent example of such insurance is credit default swaps on U.S. Treasury bonds, the market for which has ballooned in the last two years. Such swaps tend to sell at a discount precisely because, as economist Jeffrey Hummel has observed, they would be triggered only by the type of economic catastrophe (a default by the U.S. government on its own debt) that would likely bring about the bankruptcy of the swap sellers.¹¹⁵ Regulators should consider permitting derivatives of this type to be sold only by entities that have no other debt and thus cannot use them to expropriate value from creditors.

It should be acknowledged that the Treasury report's lack of reference to matters of correlation does not mean that the authors did not anticipate a role for correlation-based metrics in the implementation of its proposals. Those proposals are stated in general terms, with important details presumably to be worked out later. Thus, as part of the proposed capitalization requirements, Administration officials might have anticipated some reliance on “value at risk” (“VAR”) models that use correlation coefficients (as well as many other variables) to estimate the volatility of a firm's net asset value. Such models can be used to try to tailor capital requirements to firm-specific risk levels. For example, VAR-driven capital requirements are contemplated by the Basel II Accords, a set of international bank regulation benchmarks that have been adopted by numerous countries, including the United States.¹¹⁶ However, VAR models have inherent limitations, including that they necessarily exclude risks with low estimated probabilities,

¹¹⁵ Jeffrey Rogers Hummel, *Why Default on U.S. Treasuries is Likely*, Library of Economics and Liberty (Aug. 3, 2009). At <http://www.econlib.org/library/Columns/y2009/Hummeltbills.html>.

¹¹⁶ PHILIPPE JORION, *VALUE AT RISK: THE NEW BENCHMARK FOR MANAGING FINANCIAL RISK* (3d ed. 2006).

such as below 5% or 1%.¹¹⁷ For this reason, many of the VAR models used by major institutional investors failed to allow for the risk of a housing market collapse.¹¹⁸

The failure of VAR models to anticipate (and hence help obviate) the financial crisis is unsurprising, as reasonable minds can differ about the probability of uncertain events, especially those not predicted by historical data. Thus, as I noted previously, AIG executives might have formed widely differing views on the likelihood of deep liability on the company's mortgage-linked swap contracts. But there could have been far less dispute over the fact that, if such liability was triggered, the company would also suffer deep losses on the mortgage-backed securities it owned. In other words, correlations will often be easier to estimate than stand-alone probabilities. These observations suggest a need for regulations that place absolute limits on a financial intermediary's exposure to sector-specific risks, regardless of whether those risks exceed a probability threshold. In this sense, regulatory measures to limit correlation-seeking should go beyond capital requirements, even if the capital requirements also take correlations into account.

B. Correlation And Fraudulent Conveyance Law

The failure by lawmakers to recognize the distinct opportunism hazard presented by contingent debt is a defect not only of current legislative proposals, but also of traditional creditor protection doctrines. The most important of these traditional doctrines is fraudulent conveyance law, which gives a court the power to subordinate a contractual claim against a debtor if two requirements are met: first, the debtor was (or became) insolvent when the claim was incurred; second, the debtor did not receive "reasonably equivalent value" in exchange.¹¹⁹ Both of these requirements make sense when used to prevent misuse of fixed liabilities. But they are wholly unsuitable for policing contingent liabilities, and when applied to them will almost always do more harm than good. Contingent liabilities need their own, separate fraudulent conveyance rules. In particular, the insolvency requirement should be dropped, and the "reasonably equivalent value" requirement should be reconceptualized to focus on the factor that actually drives the opportunism hazard: correlation.

Fraudulent conveyance doctrine aims to protect creditors by preventing a debtor from giving away assets rather than using them to pay down the debtor's legitimate debts. "Legitimate" is the key word here, because a so-called loan can in fact be an asset giveaway in the guise of a formal legal arrangement. But why would an indebted firm simply give away its assets? The answer, of course, is that it usually would not, because by doing so it would harm its shareholders. But incentives change when the firm falls insolvent, because at that point shareholders have no remaining economic stake in the

¹¹⁷ See Joe Nocera, *Risk Management*, N.Y. TIMES MAGAZINE (Jan. 2, 2009).

¹¹⁸ *Id.*

¹¹⁹ 11 U.S.C. § 548(a)(1)(B); Unif. Fraudulent Transfer Act §§ 4(a)(2), 5(a). Under the older Uniform Fraudulent Transfer Act, which is still in effect in some states, a "fair consideration" test stands in for the "reasonably equivalent value" requirement. Unif. Fraudulent Conveyance Act § 4. In the alternative, a court could subordinate a claim if it finds that the debtor deliberately incurred it in order to engage in fraud or deceive debtors. 11 U.S.C. § 548(a)(1)(A). I ignore this alternative here because it is rarely used to challenge the types of contingent liability that are this Article's focus.

firm,¹²⁰ even though they might continue to control it. In other words, an asset giveaway costs shareholders of an insolvent firm essentially nothing, and it might benefit them if the assets are transferred to their friends and loved ones, or to another company they control. It thus makes sense for fraudulent conveyance law to concern itself with gifts a debtor makes while insolvent. And the same is true for fixed debt a debtor incurs while insolvent, which can serve the same function as outright gifts. For example, instead of giving an affiliated company \$100, a firm could sign a “loan agreement” that promises to “repay” that affiliate \$110 in one week, even though the affiliate has in fact lent the firm only \$10. As in the case of an outright gift, a grossly imbalanced loan of this type costs shareholders nothing if their firm is already insolvent and fated for bankruptcy.

However, not all liabilities incurred by insolvent debtors are opportunistic, which is why fraudulent conveyance law also has its “reasonably equivalent value” requirement. And that requirement also serves a useful function when applied to fixed debt. To see why, consider again the \$25 fixed liability analyzed in Figure Two. That figure assumed that Claimant was willing to pay Debtor a premium equal to her expected recovery on her claim, which is the maximum amount a rational, risk-neutral party in Claimant’s position would pay. Given the other assumptions used for Figure Two, that amount was \$24.29. And, as the figure showed, this arrangement increased Unsecured Creditor’s expected losses by 13%. How much worse off would Unsecured Creditor be if we assumed instead that Debtor simply gave away the \$25 fixed claim to Claimant for free? In that case, the increase in Unsecured Creditor’s expected losses would more than quadruple, to 60%.¹²¹ The implication is that forcing creditors to pay reasonably equivalent value for fixed claims—with reasonableness defined in terms of the creditors’ willingness to pay—greatly reduces the opportunity for debtors to use such claims to capture wealth from their unsecured creditors.¹²²

The story changes, however, when we apply the two fraudulent conveyance requirements to contingent debt. Take the insolvency requirement first. As described above, that requirement reflects an assumption that managers would permit their firm to agree to overpay a creditor only if they thought that the firm would be insolvent when the debt came due. And it further implicitly assumes that managers can intend for their firm to be insolvent in the future only if it is already insolvent, presumably because rational managers would not deliberately drive their firm bankrupt. This logic seems plausible when the debt is 100% certain to come due—that is, when it is fixed. But it breaks down when the obligation to pay is contingent upon an uncertain future event, and managers

¹²⁰ Except for perhaps an upside “option” value, which I ignore.

¹²¹ This is calculated by taking equation (2) in note 17, *supra*, and setting P equal to \$0.

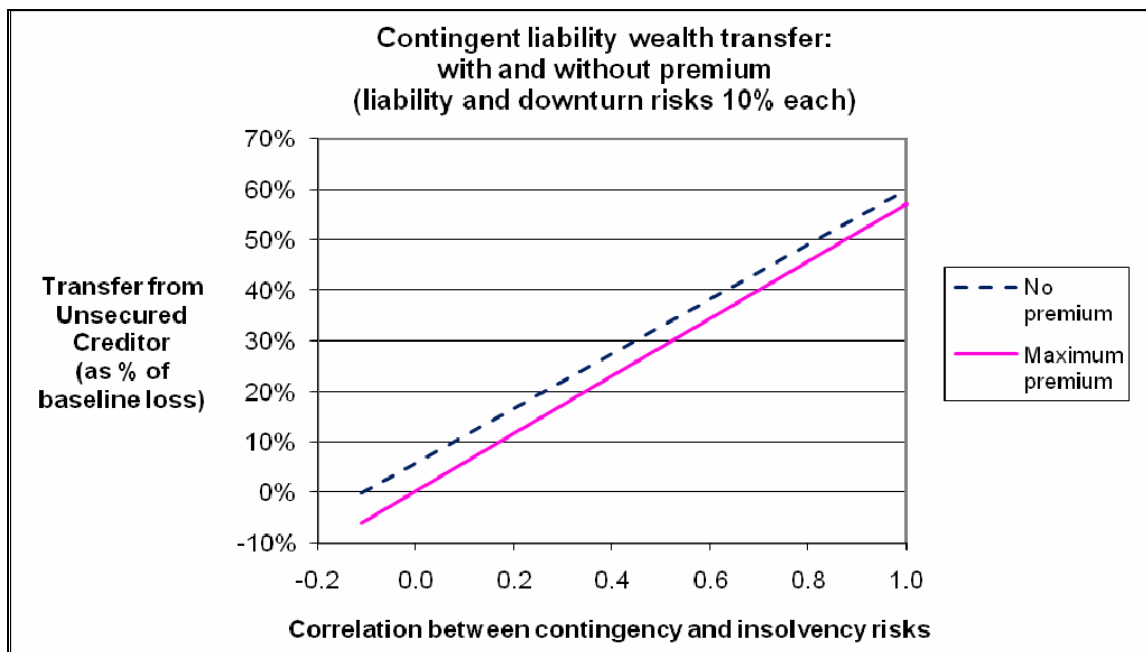
¹²² A potential objection is that I have used a model which assumes that Debtor is solvent when it incurs the fixed liability, but that courts apply the reasonably equivalent value requirement only to insolvent debtors. But the question whether Debtor starts out solvent does not affect the point being illustrated, which is that the dilutive impact of a fixed liability greatly increases if the debtor does not receive equivalent value for it. For example, if we were to assume that Debtor’s assets were worth \$75 in period one—and thus that Debtor started out insolvent—then Claimant would be willing to pay a premium of \$18.75 for her \$25 fixed claim, and this amount would perfectly neutralize the claims’ dilutive impact on Unsecured Creditor. But if Claimant instead paid no premium, her claim would increase her expected losses by 60%, just as in the case where Debtor starts solvent.

know that the event is highly correlated with the risk that the firm will fall insolvent. In that case, the firm does not have to be insolvent now for managers to expect that it probably will be if the liability comes due. Therefore, a fraudulent conveyance doctrine that applies an insolvency requirement to contingent liabilities will be badly underinclusive, missing many instances where the opportunism hazard arises. This conclusion is borne out by the results in Figures Two and Three, which depicted contingent liabilities that had the capacity to produce large expected wealth transfers even though both figures assumed that Debtor was solvent when the liabilities were incurred.

What about the reasonably equivalent value requirement? Should lawmakers continue to apply it to contingent debt, even while they jettison the insolvency requirement? To answer this, a prior question must be addressed: What exactly is the “equivalent value” of a contingent liability? Although courts have differed on this question, the approach most often used today is something akin to a simple expected value calculation.¹²³ In other words, courts try to estimate the original probability that the liability would be triggered, and then multiply this by the liability’s face value. The closer the actual premium comes to this product, the more likely the court will find that the claimant paid “reasonably equivalent value.”

How much protection does this approach afford unsecured creditors? The answer, as Figure Four indicates, is almost none at all:

Figure Four



The figure reflects the same numerical assumptions that were used for Figure Two. The line labeled “Maximum Premium” shows the impact on Unsecured Creditor when Claimant pays a premium equal to her expected recovery on her claim—which, as noted

¹²³ The most influential decision in this line was written by Judge Richard Posner. See *In re Xonics Photochemical, Inc.*, 841 F.2d 198 (7th Cir. 1988).

previously, is the maximum amount a rational claimant would pay.¹²⁴ And the “No Premium” line shows the opposite extreme, where Claimant receives a contingent claim but pays Debtor nothing for it.

Figure Four reveals that the reasonably equivalent value requirement, at least as courts now interpret it, serves essentially no useful function when applied to a contingent liability. By forcing claimants to pay expected value, that requirement in effect tries to move unsecured creditors from the “No Premium” line to the “Maximum Premium” line. But the distance between these lines is slight, a mere 3% to 6% in terms of Unsecured Creditor’s baseline loss. By contrast, recall that the same approach made a 47 percentage point difference to Unsecured Creditor when the claim was fixed. Thus, relative to the other factors that drive Unsecured Creditor’s recovery, the question whether Claimant pays a premium for her contingent claim at all—let alone the maximum amount she would pay—is trivial. Far more important to Unsecured Creditor is the internal correlation on the liability, which as it swings from zero to perfect in Figure Four increases his expected losses by more than 50%. And the question whether the claimant pays in full becomes even less important as the chance of the triggering event decreases. For example, if we were to assume that the contingency and downturn risks were each 1% rather than 10%, the correlation level would still make more than a 50% difference in terms of Unsecured Creditor’s expected losses. But the difference made by the premium would shrink to less than 1%.

Another implication of Figure Four is that the current fraudulent conveyance approach to contingent liabilities makes big mistakes in both directions. Thus, a court would almost certainly hold that the claim at the upper right endpoint of the “Maximum Premium” line was given for reasonably equivalent value, because Claimant paid a premium for that claim equal to her full expected recovery on it. And yet this claim produces a large expected transfer away from Unsecured Creditor, increasing his expected losses by 57%. By contrast, a court would hold that the claim at the lower left endpoint of the “No premium” line was not given for reasonably equivalent value, because Debtor gave that claim away for free. And yet that claim has no impact on Unsecured Creditor at all.

Current doctrine performs so poorly because it fails to define “reasonably equivalent value” from the perspective of the party it is supposed to protect. Thus, when courts rely upon a simple expected value calculation, they are essentially adopting the perspective of the contingent claimant, and asking whether she paid a premium that approximated her claim’s actual value to her. For example, Claimant would be willing to pay a \$1.52 premium for the perfectly correlated contingent claim depicted in Figure Four. And, under current doctrine, a court would certainly deem that amount sufficient. On the other hand, Shareholders would be willing to give this contingent liability away for anything greater than zero, because they bear no downside risk on it at all. Therefore, the actual premium paid for that claim will be the product of a negotiation between these endpoints. But the outcome of that negotiation is of essentially no consequence to Unsecured Creditor. Because of the high internal correlation on that liability, Claimant

¹²⁴ This line is thus identical to the contingent liability line in Figure Two.

would have to pay a premium of \$31.25 to prevent it from increasing Unsecured Creditor's expected losses,¹²⁵ more than *twenty times* the maximum she rationally would pay. The scale of this differential shows that courts should not waste time and litigation costs trying to determine how much a claimant actually paid for a contingent liability, because the difference between the maximum and minimum amounts she could have paid will make almost no difference to the size of the expected wealth transfer.

These observations suggest that the current fraudulent conveyance approach to contingent liabilities almost certainly does more harm than good. It is both fact-intensive and speculative, requiring courts to try to overcome hindsight bias to estimate the original odds that a liability would be triggered, and also to try to determine how much value a debtor actually received when the liability was incurred. Moreover, such efforts are in vain, because the outcomes to which they lead are unlikely to bear any meaningful relationship to the hazard they are supposed to prevent. For this reason, the exemption that derivative contracts now enjoy from the Code's fraudulent conveyance provisions is probably not a bad thing, at least to the extent that those contracts create contingent liabilities. This does not mean, however, that a better approach cannot be imagined. To the contrary, the foregoing analysis suggests that a fraudulent conveyance approach to contingent debt could be crafted that would be both cheaper to apply and more likely to reach the right outcomes. If such an approach were developed, there would be every reason to apply it to derivatives, as well as to more traditional contingent debt contracts such as guaranties.

A better fraudulent conveyance approach to contingent debt would depart from current doctrine in two ways. First, it would abandon the insolvency requirement, or at least reserve it for liabilities that originally had a high probability of being triggered and thus behave more like fixed liabilities. As I have noted, the logic of this requirement simply does not apply when a claim is contingent rather than fixed. Moreover, the requirement is another source of high litigation costs, embroiling courts in fact-intensive inquiries into the fair value of a debtor's assets and liabilities at some point in the past.

The second needed departure from current doctrine is a reconceptualization of the reasonably equivalent value requirement. Rather than trying to determine how much a claimant in fact paid for a contingent claim, courts should look at the factor that actually drives the scale of the wealth transfer: the internal correlation. And, because the purpose of fraudulent conveyance law is to deter opportunism, what courts should consider more specifically is the correlation that would have been evident to an informed claimant when the liability was incurred. When that correlation is low, a court can be confident that the liability imposed at most a minor expected loss on the debtor's unsecured creditors, even if the debtor gave the liability away for free. Such liabilities present no opportunism hazard, and thus should be enforced in full. But when the internal correlation is high, a court can be confident that the claim produced a large expected wealth transfer, even if the debtor managed to bargain for the largest possible premium the claimant was willing to pay. Such liabilities should automatically be subordinated, thereby nullifying the wealth transfer away from the debtor's unsecured creditors. Without the expectation of

¹²⁵ This is calculated by taking equation (2) in note 17, *supra*, setting T equal to zero, and solving for P.

that transfer, the claimant will not pay a premium that exceeds the liability's expected burden on the debtor's shareholders, thereby removing the debtor's incentive to incur liabilities whose social costs exceed their benefits.

How would courts estimate the internal correlation at the time a contingent liability was incurred? Although a complete answer to this question is a subject for further scholarship, a few factors that might serve as reliable indicators of positive internal correlations can be identified here. First, the contingent liability created by a guaranty contract will almost invariably have a high internal correlation if the guarantor and borrower are under common control—that is, if both are part of the same corporate group, or the guarantor is a shareholder who has given a personal guaranty on the debt of a closely-held corporation. As I have noted previously, the fortunes of borrower and guarantor in such situations tend to be tightly linked, either because the two produce the same economic outputs, or because one owns a large equity stake in the other.

More broadly, contingent liabilities tend to have high internal correlations, and thus should presumptively be subordinated, when the debtor is in the same industry or sector as is the firm or asset whose performance risk is the subject of the contingency. For example, stock prices for firms in the same industry are more highly correlated than are stock prices generally.¹²⁶ For this reason, courts might adopt a presumption that a claim on a put option is to be subordinated whenever the seller is in the same industry as the issuer of the reference stock. And the same rule would apply to a credit default swap on a bond where the swap seller is in the same industry as the bond issuer.

Finally, perhaps the most important indicator of a positive internal correlation is when the contingent liability's face value is greater than the debtor's equity value when the liability is incurred. As Figure Three illustrated, liabilities of this type always produce large expected wealth transfers, suggesting that they always should be subordinated.¹²⁷ Also, a liability should be subordinated not only if its face value individually exceeded the debtor's equity value, but also if its face value combined with the value of other contingent liabilities already on the debtor's books exceeded the equity value and the triggers on those liabilities were themselves highly correlated.

A potential objection to the approach I have sketched here is that it involves a factual question—that is, the internal correlation when the contingent liability was incurred—that may be speculative, and that also will invite hindsight bias. Unfortunately, a degree of conjecture and bias will be a pitfall of any fraudulent conveyance doctrine that attempts to analyze conditions when a liability was incurred rather than after it has been triggered. But questions of correlation will usually be less speculative than the expected value questions that current doctrine now forces courts to ask. As I observed earlier, reasonable minds could have differed in 2005 on the question whether liability on AIG's mortgage-linked swaps was likely. And yet the answer to this question would be an essential component of an expected value calculation. By contrast, there could have been far less doubt that, if liability on the swaps was triggered, AIG's

¹²⁶ Chan et. al., *supra* note 34, at 943.

¹²⁷ For claims that create a range of possible liability amounts, courts could treat the expected mean, or perhaps the mean plus a standard deviation, as the relevant point for determining whether to subordinate.

own mortgage-backed securities would also suffer deep losses. This example suggests that the question whether two future events are correlated will often be much easier to answer than the question of the events' independent probabilities. And, as the previous discussion implied, a correlation-based doctrine would rely on bright-line rules that consider, for example, whether assets are deployed in the same industry or are under common control. For these reasons, a correlation-based fraudulent conveyance approach to contingent debt would be easier than current doctrine to apply, even while it also would be far more effective in preventing opportunism that destroys social wealth.

The AIG example does, however, point to a different limitation of my proposed approach. By looking at the internal correlation only at the time a contingent liability was incurred, my approach would not deter “reverse” correlation-seeking, where a firm first incurs a liability and then acquires assets that are more likely to lose value if that liability is triggered. This is partially what happened at AIG, where the campaign of buying up mortgage-backed securities continued apace after the company stopped selling credit default swaps in 2005. Reverse correlation-seeking would, however, be deterred if claimants anticipated it and accordingly paid smaller premiums, or if they monitored the debtor to prevent it. And, in theory, fraudulent conveyance law could goad claimants along in this regard by subordinating their claims if the debtor acted to increase the internal correlation after the claims were incurred. However, with the exception of derivative counterparties, there is no general reason to think that contingent claimants are better monitors of a debtor than are other unsecured creditors. Thus, subordinating contingent liabilities for reverse correlation-seeking may simply discourage contingent debt generally rather than correlation-seeking specifically. It is for this reason I have recommended an approach that would hold contingent claimants responsible only for the correlation evident at the time their claims were incurred. Importantly, the limitation I describe here is also a drawback of current fraudulent conveyance doctrine, which similarly does nothing to deter reverse correlation-seeking. Thus, this limitation is not a reason to prefer current doctrine to the correlation-focused approach I advocate. It does, however, suggest that an effective legal response to correlation-seeking must include multiple elements, combining reform of fraudulent conveyance doctrine with, for example, the regulatory approach to derivatives discussed previously.

CONCLUSION

This Article has identified an opportunism mechanism that creates an incentive for firms to overuse a wide variety of prevalent financial contracts—such as credit default swaps, put options, and guaranties. Each of these contract types imposes a liability that becomes payable only upon the occurrence of an uncertain future event. If that liability is especially likely to be triggered when the liable firm is insolvent, the contract transfers value from the firm's unsecured creditors to its shareholders. This transfer acts like a thumb on the scale, causing firms to incur contingent liabilities that correlate, or through subsequent asset purchases can be made to correlate, with their insolvency risk, even if the social costs of doing so exceed the benefits. Such correlation-seeking destroys social wealth through overinvestment, greater risk of financial distress, higher borrowing costs, and potential systemic risk.

Despite such costs, lawmakers and scholars have ignored correlation-seeking. Thus, legal measures that are supposed to protect creditors regulate contingent debt under principles designed to prevent misuse of fixed debt. Such measures include not only fraudulent conveyance doctrine, but also the regulatory regime for derivatives proposed by the current Administration. The failure of the derivative proposals to address matters of correlation is particularly troubling given that their express purpose is to avert another AIG, whose collapse was caused by a high correlation between the company's liability and asset risks. The proposals would therefore raise the costs of using all derivative contracts, but would not counteract the opportunism incentive that creates the possibility of another AIG in the future. Lawmakers should fundamentally reconceptualize their approach to contingent liabilities, discarding principles that are suitable only for fixed liabilities, and instead focusing on indicators of correlation between the contingency risk and the liable firm's insolvency risk.

As this last observation indicates, lawmakers need reliable indicators of internal correlation if efforts to deter correlation-seeking are to be cost-effective. Future empirical research could be greatly useful in this regard. For example, it would be valuable to know which variables—such as industry, common ownership, and so on—best predict high internal correlations. To tailor rules to specific contract types, separate data would be required for correlations between equity values and insolvency risk (which would predict misuse of put options), and for correlations between insolvency risk across firms (predicting misuse of credit default swaps and guaranties). In addition, regulators could use information on the degree to which prices for contingent claims vary depending on the seller's debt structure, thereby flagging those contract types that are likely being subsidized by significant expected wealth transfers. Not only would such information reveal correlation-seeking in specific firms, but it also would alert regulators to trends across firms, thereby helping them identify an increase in systemic risk before it manifests in another financial crisis.