

Increased-Liability Equity: A Proposal to Improve Capital Regulation of Large Financial Institutions

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Comments Welcome

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Abstract

While it is recognized that the high degree of leverage used by financial institutions creates systemic risks and other negative externalities, many argue that financial institutions must rely on extensive debt financing since equity financing is “expensive.” Some of the reasons debt is attractive to financial institutions, such as tax benefits and implicit guarantees, are due to subsidies that exacerbate the negative externalities associated with leverage, and are therefore not legitimate from a public policy perspective. Another argument given for high levels of debt financing is that debt serves as a disciplining device for managers who would otherwise make suboptimal or wasteful investment decisions. We propose a mechanism that allows financial institutions to maintain the contractual obligations of debt while avoiding or reducing many of the costs associated with it, including deadweight bankruptcy costs, agency costs due to risk shifting, and under-investment associated with debt overhang. Essentially, we propose a way to increase the liability of the equity issued by the financial institution without changing the limited-liability nature of publicly-held securities. The increased liability is backed by a proposed “Equity Liability Carrier,” which holds the increased-liability equity of the financial institution as well as safe liquid assets. In addition to reducing or eliminating the agency problems associated with leverage, this structure concentrates the incentives to monitor and control managers within equity holders, and reduces the need for inefficient liquidation, implicit guarantees and bailouts. Our proposal can be viewed as a way for regulators to impose effectively higher capital requirements, while allowing financial institutions to undertake significant debt commitments.

Keywords: capital regulation, financial institutions, capital structure, banking regulation, “too big to fail,” systemic risk.

JEL classifications: G21, G28, G32, G38, H81, K23.

1. Introduction

Two simple propositions seem to be taken as axiomatic in most discussions about the capital structure of financial institutions (hereafter FIs):

- 1) The high degree of leverage used by FIs creates numerous problems and is associated with significant negative externalities.
- 2) Leverage seems to be necessary for financial institutions; equity is an expensive form of capital and must therefore be used sparingly.

These two propositions – “Leverage is Bad” and “Leverage is Necessary” – lead to an apparent tradeoff, and optimal regulation seems to involve determining how much leverage should be permitted to allow cost-efficient financing of FIs without creating significant problems for the regulator due to the negative externalities.

The problems associated with high degrees of leverage were well known before the recent financial crisis, and the events of the last two years have made these even more apparent. From a public policy perspective, one of the most significant costs of the leverage of financial institutions is associated with systemic risk and the “too big to fail” subsidy that government seems to be forced to extend to large FIs. Systemic risk is due to the interconnectedness of FIs and to the high societal costs associated with the failure of a large FI. Regulators attempt to control the amount of risk taken on by FIs in part by defining the amount of permitted leverage based on various measures of the risk of the FI’s assets. This is made difficult because leverage gives the shareholders and management of FIs incentives to take on risk.

Modigliani and Miller’s irrelevance results show that in a perfect market with no agency costs or other frictions, equity is neither “expensive” nor “cheap,” since a firm’s total cost of capital simply does not depend on how much equity is used. Under the perfect market assumptions, “economizing” on the use of equity by increasing leverage does not lower the overall cost of capital, but instead leaves it unchanged. This is because the required return on equity capital is increasing with the amount of leverage to reflect the increased risk equity bears in the presence of leverage. Thus, *in a perfect market, a financial institution with less leverage would have the same cost of capital as a more highly leveraged institution and would not engage in less lending or charge higher rates from its borrowers than its more highly levered counterpart.* Capital structure affects the overall cost of capital only to the extent that “market imperfections” such as taxes, bankruptcy costs, agency costs, and asymmetric information, are important, but *not*

because of the simple fact that equity is more risky than debt and thus earns a higher required return.¹

Incentives for “risk shifting” constitute one of the main agency problems associated with debt financing. Since equity holders in a levered firm have limited liability, they have the option to default, and an increase in the riskiness of the firm’s assets increases the value of that option. As is well known, an increase in the riskiness of the firm’s assets allows the equity holders to realize increased benefits on the upside, while the debt holders bear the costs on the downside. This problem is particularly severe if the debt is insured through either deposit insurance or implicit government guarantees. In this case it is the government or the insurer who bears the downside risk. The presence of deposit insurance has provided some of the motivation for capital regulation of financial institutions, and the recent crisis has led to increased focus on this problem.²

In addition to risk shifting issues, high leverage can lead to the so called “debt overhang” problem, which occurs when equity holders of a distressed firm do not undertake worthwhile projects because the payoffs from these projects mainly benefit debt holders. It is widely believed that debt overhang considerations significantly contributed to the credit freeze experienced in the recent financial crisis. (See Philippon and Schnabl (2009) and the references therein.)

Some of the debt undertaken by financial institutions, such as demand deposits, is no doubt essential to their “production functions,” which includes providing liquidity and maturity transformation. But it seems that financial institutions take on significantly more leverage than what is integral to their business. For example, banks obtain billions of dollars in funding through long-term debt issues, much of which in principle could have been raised as equity.³

One reason that equity is considered an “expensive” form of capital is that government policy effectively subsidizes debt and thereby makes it relatively “cheap.”

¹ While the Modigliani and Miller result is one of the most fundamental results in corporate finance, the claim that equity – or, as it is called in the banking context, capital – is “expensive” often seems to be justified by arguments that equity is more risky and thus has a higher cost of capital. For example, Elliot (2009, p. 12) says “The problem with capital is that it is expensive. If capital were cheap, banks would be extremely safe because they would hold high levels of capital, providing full protection against even extreme events. Unfortunately, the suppliers of capital ask for high returns because their role, by definition, is to bear the bulk of the risk from a bank’s loan book, investments and operations.” The Modigliani and Miller result shows that this reasoning is flawed.

² Our discussion in much of the paper does not explicitly involve deposit insurance. However, as discussed in Section 5, our approach can easily be combined with deposit insurance and can help in resolving the agency problems that arise in the presence of such insurance.

³ The most recent balance sheet of Wells Fargo Bank lists about \$214 billion in long term debt, and that of Citigroup includes about \$380 billion in long term debt.

First, there is the standard tax shield associated with the deductibility of interest payments. Second, for financial institutions deemed “too big to fail,” debt is effectively subsidized through the implicit guarantees associated with government bailouts, essentially providing insurance without charging for it up front.

Subsidizing something that leads to significant *negative* externalities is not generally considered sensible public policy. There has been much discussion of the undesirability of implicit guarantees and bailouts, and proposals for changing regulations are focused on trying to reduce these subsidies. We note here that it seems reasonable to also consider ways to equalize the tax treatment of debt and equity for financial institutions so that the tax code does not favor problematic debt financing. Given the negative externalities associated with the leverage of financial institutions, any subsidies given to them should not come in a form that encourages leverage.

In light of the above, the question is whether there are potentially *legitimate* reasons, from the perspective of the public and regulators, to allow FIs to take on significant levels of leverage beyond what is essential to their function. (If such reasons cannot be found, then it would seem appropriate to increase capital requirements for FIs significantly.) An oft-cited reason for why equity is “expensive” for FIs, and why high degrees of leverage facilitate their efficient operation and should be allowed, is the potential disciplining role of debt. Specifically, debt is considered helpful in resolving agency problems between managers and capital providers in an FI by providing incentives that keep managers from diverting free cash flow to wasteful and inefficient investments. This suggestion was applied generally to all firms with a potential free-cash-flow problem by Jensen (1989). A recent articulation of this in the context of financial institutions and the recent crisis is in Kashyap, Rajan and Stein (2008), who state:

“Banks perceive equity to be an expensive form of financing and take steps to use as little of it as possible... One reason for this cost-of-capital premium is the high level of discretion that an equity-rich balance sheet grants to bank management. Equity investors in a bank must constantly worry that bad decisions by management will dissipate the value of their shareholdings. By contrast, secured short-term creditors are better protected against the action of wayward bank management. Thus, the tendency for banks to finance themselves largely with short term debt may reflect a privately optimal response to governance problems.”

The disciplining impact of debt is based on the idea that managers are more likely to make contractually-required payments to debt than they are to make discretionary payments to equity holders. In this situation equity financing is truly expensive because it

leads to a more significant free cash flow problem, which would lower the value of the FI. A simple model of this, found in Hart and Zingales (2009), is that the manager “steals” a fraction of the cash flow that is not paid to debt holders. Another way that debt can play a disciplining role occurs when debt holders help monitor the actions of the FI’s managers to the potential benefit of both the debt holders and the equity holders. Note that if debt is put in place for the purpose of disciplining managers, it is implicitly assumed that managers cannot be disciplined effectively in other ways such as through their compensation contracts. Moreover, the board or the equity holders of the bank are assumed to control the capital structure decisions and the implicit assumption is that managers are unable to “unlever” the FI and remove or reduce the discipline imposed by debt.⁴

In this paper we address the following question: is there a financing structure that can preserve high leverage and its possible disciplinary benefits at the FI level, while at the same time eliminating or reducing the costs and distortions associated with high leverage? The ideal structure would eliminate the subsidies associated with bailouts and the systemic risk of defaults and at the same time reduce the incentives for risk-shifting and the other agency costs of debt.

In Section 2 below, we propose a mechanism that we believe has the desirable attributes described above. It maintains the contractual obligations of debt without incurring many of its costs, and it internalizes the negative externality associated with FI leverage so that bailouts and implicit guarantees are most likely not needed. The structure we propose essentially increases the liability of the equity issued by the FI, but it does this in a way that does not change the limited-liability nature of publicly-held securities. Essentially, we propose the creation of a separate entity that maintains additional liability coverage for the FI equity by holding safe liquid assets. Our proposal is different in important respects from some of those made recently in the context of bank capital, including increasing capital requirements, reverse convertibles, and default insurance. These differences are discussed in Section 3. In Section 4, we address issues associated with monitoring and governance under our proposal. Section 5 discusses some

⁴ A model of the role of capital structure in disciplining managers is developed in Stulz (1990). In that model debt helps prevent managers from taking projects that reduce the value of the firm, but also prevents them from taking some desirable projects. Debt contracts also arise in the context of models with “costly state verification,” such as Gale and Hellwig (1980) and Diamond (1984). These models, however, and recent dynamic agency models such as DeMarzo and Sannikov (2008), are focused on the interaction between an entrepreneur and a capital provider, and not on the interactions between managers and dispersed equity holders. Moreover, most models where debt contracts resolve agency problems rely on the threat of bankruptcy (whereby the firm is liquidated, managers are fired, and/or cash flows are observed at a cost). They do not seem to apply to large and diversely held FIs that are “too big to fail,” unless there is a way for the government to manage the process so it provides the appropriate discipline while allowing the financial institution to function. Note also that if bond holders believe they will be paid for sure, in part because of implicit guarantees, then they have no incentives to monitor managers.

issues associated with the implementation of the proposed structure. We provide some concluding remarks in Section 6.

2. Our Proposal: Create Increased-Liability Equity

Limited liability, i.e., the notion that investors cannot lose more than they invested, is “a distinguishing feature of corporate law – perhaps *the* distinguishing feature of corporate law” according to Easterbrook and Fischel (1996, p. 40).⁵ Our proposal is based on the observation that, while extremely important for allowing investors to achieve diversification and for the liquidity of financial markets, limited liability is in fact the source of many of the problems associated with leverage. The structure we propose is aimed at effectively increasing the liability of equity in financial institutions, so as to lower the costs associated with their leverage, but without changing the limited-liability nature of any publicly held security. If constructed appropriately, this structure should not increase the overall cost of capital for financial institutions.⁶

To understand our approach, first consider the following thought experiment: imagine (for illustration purposes only) that the equity issued by financial institutions carries with it *unlimited* liability. In this case, whenever the firm’s debt obligations could not be met, the owners of the firm’s equity would be required to cover these obligations from their other assets. Under true unlimited-liability conditions, and assuming that the personal assets held by the owners of the unlimited-liability equity would be sufficient to cover the liabilities of the FI in the worst case scenario, debt is riskless, and the default option that is associated with limited-liability equity disappears. Moreover, the various agency problems associated with debt disappear, and investment decisions always maximize the firm value. Equity holders with unlimited liability do not have incentives to engage in risk shifting, because they bear the full cost of unfavorable outcomes. In addition, debt overhang issues do not arise, because the full net present value of any

⁵ In fact, unlimited shareholder liability was the rule in Britain until the middle of the 19th century, and double liability was the rule for nationally chartered banks in the US until the early 20th century. For empirical examination of the impact of double liability on risk taking and on ownership structure, particularly in the banking context, see Grossman (2001), Esty (1998), Macey and Miller (1992, 1993), and Hickson and Turner (2003). Winton (1993) offers a model where shareholder liability is endogenous. For discussions of the costs, benefits, and practical issues associated with increasing the liability of equity, see, for example, Easterbrook and Fischel (1985), Hansmann and Kraakman (1991, 1992), and Grundfest (1992). Much of the discussion in the law literature was focused on tort liabilities and not on the liabilities associated with leverage.

⁶ Of course, financial institutions might see their cost of capital increase with *any* proposal that would eliminate too-big-to-fail subsidies. But these subsidies are not legitimate from the public policy perspective. To the extent that our structure reduces the agency costs of debt, the overall cost of capital might actually decrease relative to a situation in which financial institutions are fully charged up front for the costs of the implicit guarantees that they obtain from the government.

project accrues to equity. In other words, since the debt becomes riskless when equity has unlimited liability and sufficient assets to cover all the obligations, there are no conflicts of interest between debt and equity. And because there is no bankruptcy and no debt overhang, outside entities such as the government are not needed to inject capital upon distress, so the costs and distortions associated with bailouts are also avoided.

Of course, as argued persuasively in Grundfest (1992), truly unlimited-liability equity is not practical, particularly in the context of modern financial markets. What would be potentially useful is a way to create the benefits of unlimited liability without having the public hold and trade unlimited-liability instruments. We show below that this can be achieved through the creation of an entity that we call “Equity Liability Carrier” (ELC). The role of the ELC is to guarantee that the obligations of the unlimited-liability equity can be met. The limited-liability equity of the ELC will be owned and traded in place of the unlimited-liability equity of the FI, which will not be held by anyone separately from the ELC.

Here in broad brush strokes is how our proposed mechanism would work and how it effectively creates unlimited- or increased-liability equity for the FI while at the same time limiting the liability of any investor to the amount invested. We begin by describing the extreme version of our proposal, in which the liability of the equity issued by the FI becomes completely (i.e., 100%) unlimited. Later in the section we will describe less extreme versions that may achieve most of the goals of the extreme version, but which would be easier to implement.

Consider a financial institution with liabilities whose face value is equal to F .⁷ The “unlimited-liability equity” version of our proposal involves the following steps:

1. The liability of the equity of the FI becomes unlimited.
2. A separate entity, which we will call Equity Liability Carrier (ELC), is created. The ELC has the following structure:
 - a. Its assets include (i) *all* the unlimited-liability equity of the FI and, in addition, (ii) safe (riskless) liquid assets such as treasury securities whose face value is at least as large as the face value of the FI liabilities F .⁸
 - b. The ELC is financed only with standard, limited-liability equity.

⁷ We are assuming here that the liabilities of the FI are bounded. This clearly holds for debt securities issued by the bank, but at this point we do not consider positions that create potentially unbounded liabilities. This will be discussed in Section 5. Also, for simplicity we summarize the liabilities of the FI with a single number F , representing the aggregate face value (promised payment) of *all* liabilities.

⁸ Although we measure the bank’s liabilities by a single face value, we recognize that in practice there is a maturity structure to bank liabilities. In the most extreme version of our proposal we would have the maturity structure of the liabilities be matched to the safe asset holdings.

3. The unlimited-liability equity of the FI cannot be held outside the ELC ownership structure.
4. There are no restrictions on the capital structure of the FI as long as its ELC has safe assets with face value at least equal to the face value of the FI liabilities.
5. The ELC is highly regulated and operates under a strict set of rules described below.

This structure is illustrated in Figures 1 and 2. Figure 1 compares the balance sheet of a conventional FI that has limited-liability equity and risky debt with the balance sheet of the same FI under our proposed structure. In this version of proposed structure, the equity of the FI has unlimited liability and its debt is riskless. (This is achieved through the ELC as shown in Figure 2.) The value of the unlimited-liability equity is lower than that of the limited-liability equity in the conventional structure because the default option associated with limited-liability equity is removed. At the same time, the value of debt with the same face value is clearly greater when equity has unlimited liability than it is with limited-liability equity.⁹

Risky Assets	<div style="border-bottom: 1px solid black; padding-bottom: 5px;"><i>Limited</i> Liability Equity</div> <div style="padding-top: 5px;">Liabilities (Face Value = F)</div>
Financial Institution Having Conventional Structure	Financial Institution With Unlimited Liability Equity

Figure 1: The balance sheet of a conventional FI vs. under the proposed structure.

⁹ Note that this structure is distinctly different from one in which the FI is a wholly-owned subsidiary of a bank holding company that also holds safe assets. In that case the equity of the FI would still be limited liability and the FI debt holders would not generally have access to the holding company's assets if the FI was distressed. By contrast, in our structure there will be a mechanism that requires that the ELC covers FI liabilities from its assets when necessary.

Figure 2 shows the balance sheets of the FI and its ELC. Note that the ELC's assets include the (unlimited-liability) equity of the FI, as well as safe liquid assets capable of covering the FI's liabilities. The ELC is financed with limited-liability equity.

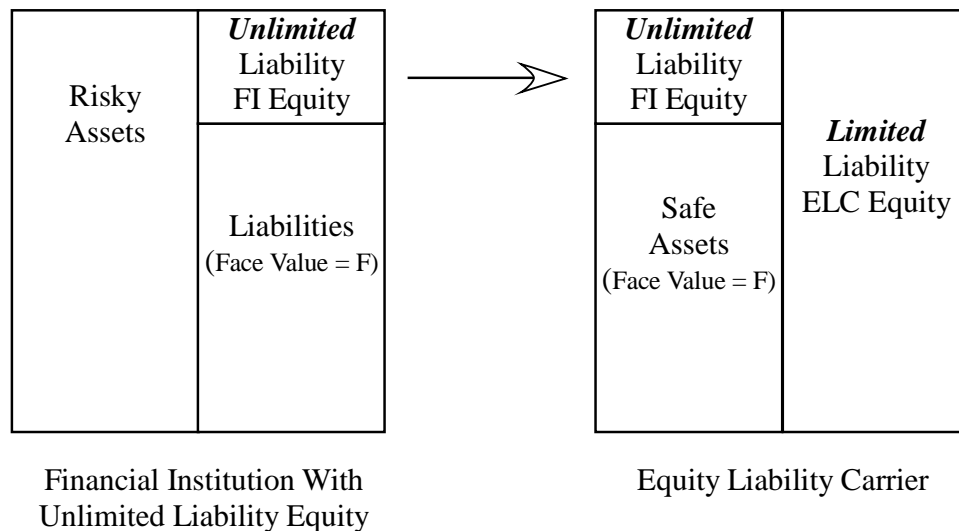


Figure 2: The balance sheet of the FI and that of the ELC under the extreme version of the proposed structure.

The relations between the FI and the ELC are subject to strict regulatory constraints as follows. Let F_l be the face value of the liabilities of the FI and let F_{ELC} be the face value of the safe assets held by the ELC. Define $S = F_{ELC} - F_l$. The following regulatory constraints must be observed in the ideal structure:

1. S must be at all times non-negative. If S becomes negative, then a corrective action must be taken, such as the FI paying down debt from its own reserves or the ELC issuing new equity and acquiring sufficient safe assets until S is non-negative.
2. The ELC can only pay dividends to its shareholders or otherwise make cash distributions (e.g., through share repurchases) if these payments are not larger than S .
3. Funds can be transferred from the ELC to the FI only if
 - a. they are used to pay down liabilities, or,
 - b. if not used to pay down liabilities, the funds transferred are not larger than S .
4. The FI can raise debt capital only if S remains non-negative.

The design of ELC effectively “guarantees” the debt of the FI. The guiding principle in the rules outlined above is that the ELC is always able to meet the unlimited-liability obligation of the FI equity that it holds. Any transfer of funds out of the ELC (to the FI or to ELC shareholders), and any debt issuance by the FI, must leave the ELC able to meet the unlimited-liability obligation.

The basic insight is that, by creating a separate liability-carrying entity, it is possible to keep the contractual obligations of the financial institution at a high level while at the same time removing the distortions associated with leverage as well as the negative externalities and high costs of distress or default. Since the debt of the FI becomes riskless, shareholders should make decisions to maximize the total value of the FI. At the same time, our structure does not involve the use of “expensive” equity that is subject to a free cash flow problem, because the discipline that leverage provides for controlling managerial incentives is maintained.¹⁰ We will discuss monitoring and corporate governance in Section 4.

Note that our structure can also address the “fire sale externality” and “credit crunch” phenomena that can occur with the conventional leverage structure of FIs. This is because, instead of having to sell illiquid risky assets in order to pay down debt, the ELC can sell safe liquid assets when this is a more effective way to raise funds for debt payments or to reduce leverage. Note as well that the rules we outline for the ELC place conditions on dividend payments that the FI can distribute to its shareholders through the ELC. We believe that capital regulation of leveraged financial institutions should generally include oversight of their dividend payments, since this represents yet another agency problem associated with leverage.

The proposal outlined above is extreme in that it requires that sufficient safe assets be held in the ELC to *fully* cover all the liabilities of the FI. We have presented this extreme version first because it shows clearly the potential benefits of increasing the liability of equity. However, applying this 100% solution to most of the large FIs would, among other things, tie up an excessively large quantity of the safe liquid assets. Fortunately, this extreme version is probably not necessary to maintain the spirit of our proposal. A partial implementation of our approach can be viewed as a way that FIs can meet increased capital requirements while at the same time maintaining a high level of leverage on their balance sheets. Rather than have the equity cushion exist entirely on the

¹⁰ Of course, by removing the value of the implicit government guarantees, the ELC eliminates one of the incentives for shareholders to pursue high leverage strategies at the FI level, but these guarantees and the risk taking incentives they create are problematic from a social welfare perspective and one objective of many capital regulation proposals is to minimize or eliminate the need for them. The tax treatment of the ELC can be designed so that it does not add to the tax burden of the FI relative to the original capital structure (for example, by using pass-through tax treatment to make using it tax neutral).

FI balance sheet, part of the cushion can be put in place at the ELC. In this way the FI can maintain high levels of contractual debt obligations at its level to solve agency or other problems. What we envision is that capital requirements could be increased significantly, but FIs would be allowed to satisfy them through an ELC structure. (We will discuss implementation issues further in Section 5.)

A general version of our proposal to increased-liability equity would require the ELC to hold safe assets in an amount and type that is determined by the riskiness of the assets and other characteristics of the FI's balance sheet. Figure 3 illustrates the general proposal.

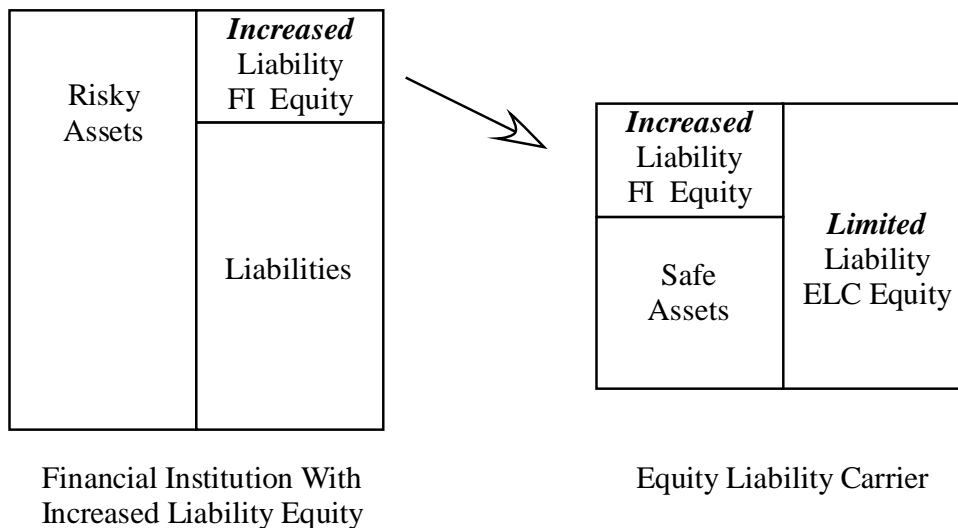


Figure 3: The balance sheet of the FI and that of the ELC in the general version of the proposed structure.

This structure can be used to meet capital requirements while maintaining high levels of leverage on the FI balance sheet. To see how, assume that the FI is required to have equity equal to $c_{req}A$, where A is the value of the FI's assets.¹¹ Assume further that the FI

¹¹ Our specification of capital requirements is a greatly simplified representation of actual capital requirements under current regulations. For example, some of the actual requirements are based on measures of risk-weighted assets and so the overall value of c_{req} is not fixed but depends on asset characteristics. This does not change the basic point we are making that some of the capital cushion can be held at the ELC in a way that allows higher leverage at the FI. It only changes how the required cushion is determined.

desires its equity to be equal to $\hat{c}A$ where $\hat{c} < c_{req}$, since having equity at the reduced level of $\hat{c}A$ allows the FI to have a higher level of contractual debt obligations on its balance sheet, which it finds useful. Instead of increasing equity to $c_{req}A$ on the FI's balance sheet, the FI can leave equity at $\hat{c}A$ and create an ELC structure with safe assets equal to $(c_{req} - \hat{c})A$. The increased liability of the FI's equity, which is held in the ELC, creates an additional capital cushion that effectively meets the capital requirements. Regulators can monitor the ELC to ensure that the required level of safe assets is held in the ELC to keep the FI in compliance with overall capital requirements.

Our approach can be understood further by comparing it to various other ways to address capital regulation for financial institutions that have been proposed in the literature. We turn to these in the next section, and then in the following section proceed to discuss various challenges that would arise in the implementation of our proposal.

3. The Proposed Structure vs. Alternatives

Since our proposal calls for essentially “backing up” the liabilities of the FI with safe liquid assets, it seems at first that it is equivalent to simply requiring the FI to hold a large amount of safe liquid assets on its balance sheet. In fact, doing so would not address the problems our structure is designed to address. As we will see, depending on how the additional safe assets are financed, adding safe assets to the balance sheet means either that the FI is actually financed with much higher amounts of equity, in which case the free cash flow agency problem presumably arises and the disciplinary benefit of debt is reduced or eliminated, or the degree of leverage of the FI, and the problems that are associated with it, remain the same and the additional safe assets do not change the overall situation.

To see this, consider again for simplicity the extreme version of our proposal, where the liabilities of the FI are fully backed by safe assets of the ELC. Consider two ways in which safe assets might be added to the FI's balance sheet. The first is illustrated in Figure 4, where we assume that the safe assets are acquired by issuing new equity equal in value to the value of the safe assets. Acquiring the safe assets in this case does not change the face value of the liabilities of the FI. As Figure 4 shows, this gives rise to the same “free cash flow” agency problem that would arise if the bank was financed entirely with equity. The FI's balance sheet effectively decomposes into two pieces. The safe

assets are held as collateral against the FI liabilities, while the risky assets currently in the FI's balance sheet are held against an all-equity version of the FI. This case is equivalent to requiring all equity financing for the current financial institution, eliminating the disciplinary role of debt.

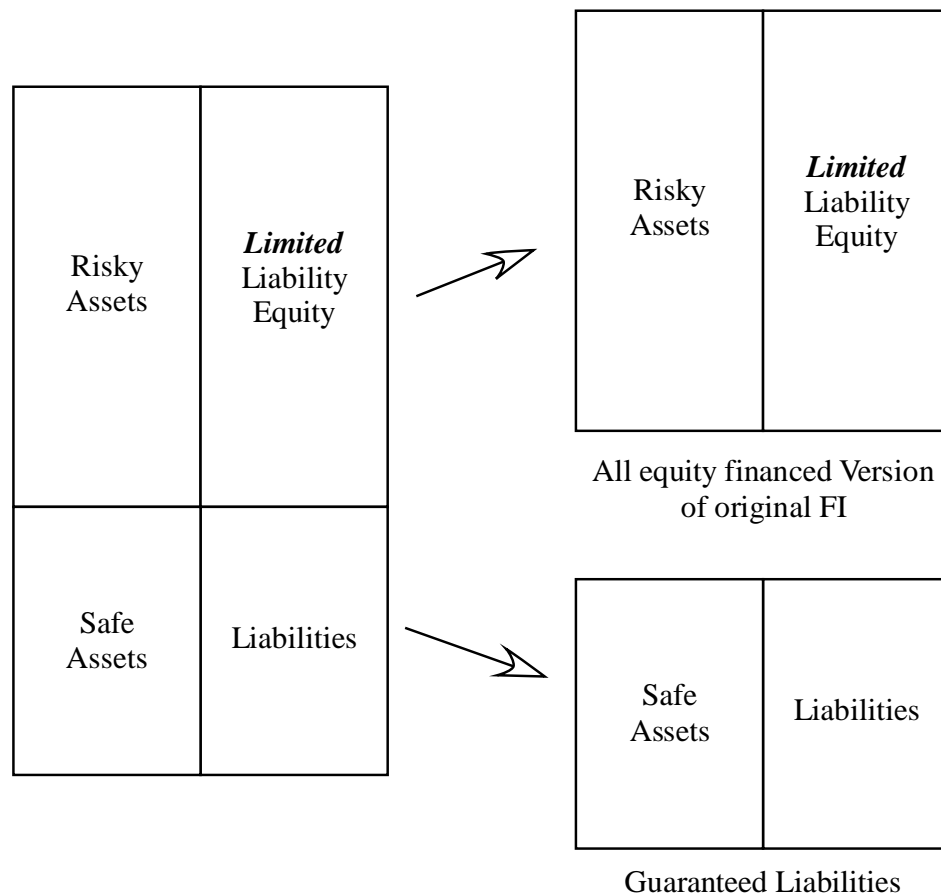


Figure 4: The case where safe assets are added directly to the FI balance sheet without changing the face value of the liabilities.

If instead of equity financing the purchase of safe assets is financed with new debt (perhaps backed by the safe assets that are acquired), the situation is as depicted in Figure 5. Relative to the original balance sheet of the FI, this change is completely superficial. It does not change the probability of default and does not solve any of the problems associated with leverage such as risk shifting, debt overhang, possible need for bailouts, etc. The FI can be viewed as decomposing into the safe liquid assets, held for now against a set of essentially riskless liabilities, and a structure that is identical to the original FI.

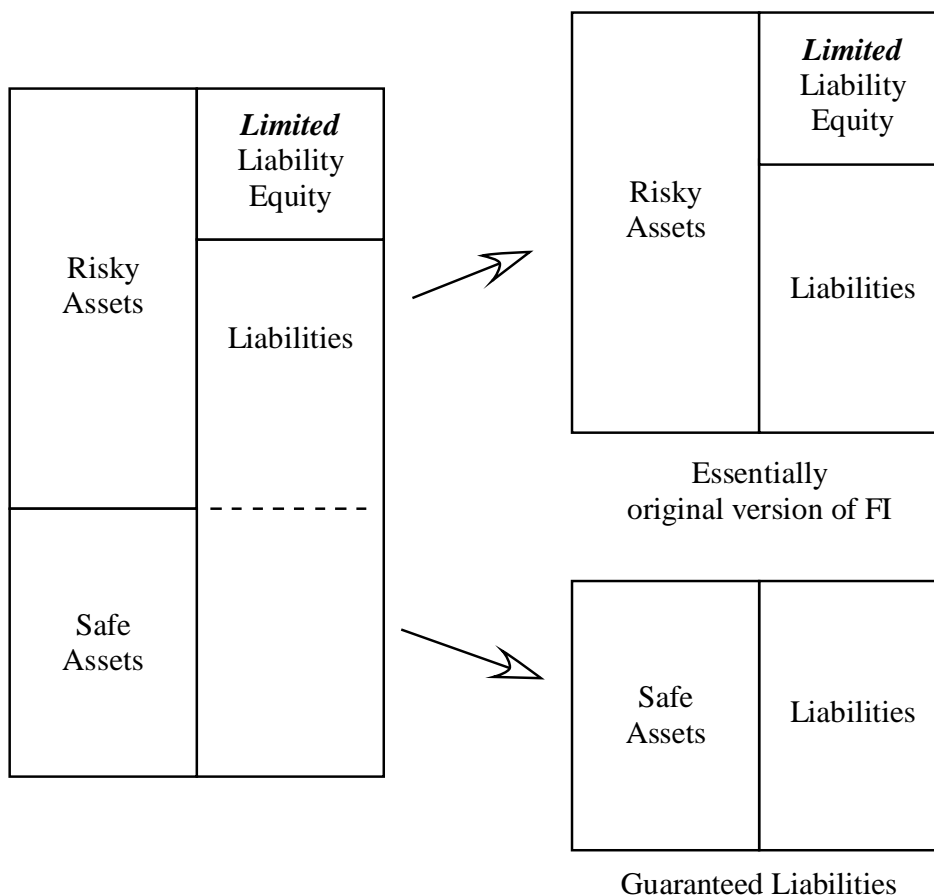


Figure 5: The case where safe assets are added directly to the FI balance sheet while increasing the face value of the liabilities.

A number of other mechanisms for recapitalizing distressed FIs so as to avoid costly bankruptcy and the need for bailouts have been proposed recently. For example, Flannery (2005) and Squam Lake Group (2008) suggest replacing straight debt with “reverse convertibles,” i.e., with debt that converts to equity when a trigger set by regulators is hit. The trigger can depend on the solvency of the FI and/or system-wide conditions related to systemic risk. This effectively shifts more risk from the government to holders of the reverse convertibles. Presumably, reverse convertibles holders must be compensated for bearing the additional risk, with the cost effectively internalized by equity. While this should reduce the possibility of bankruptcy in cases where reverse convertibles become equity, it does not address the risk-shifting incentives associated with leverage; in fact, depending on the overall leverage of the FI, and how capital regulation treats these securities, risk shifting and other agency problems might be exacerbated under this

structure, at least while the debt has not yet been converted to equity.¹² By contrast, our structure also reduces various agency problems and the resulting distortions in investment decisions.

Kashyap, Rajan and Stein (2008) propose forcing large FIs to purchase default insurance, which will be triggered by systemic events, and which will be guaranteed to deliver capital during crisis by setting aside a large quantity of safe liquid assets in a “lock box.” The proposal in Kashyap, Rajan and Stein (2008) shares with our approach the notion of tying safe liquid assets to the liabilities of FIs. However, they envision a system-wide trigger and do not tie the insurance company’s holdings directly to the liabilities of the insuring FI. Thus, while potentially quite useful to avert systemic crisis, this structure would not address agency problems associated with debt at the FI level.

Hart and Zingales (2009) propose the imposition of a recapitalization requirement that depends on the price of Credit Default Swaps on the FI debt. Specifically, they recommend forcing a financial institution to issue equity when a trigger based on CDS prices is hit. An immediate observation is that, to the extent that equity holders are forced to put up more capital to cover debt obligations when it is not in their interest to do so, this proposal effectively amounts to increasing the liability of equity, which is similar in spirit to our approach. The main difference between our proposal and that in Hart and Zingales (2009) is that in our approach the capital is set aside upfront, and thus we do not envision a process whereby a regulator must seek equity holders to invest additional capital in situations where they do so at a loss.

Kotlikoff (2010) proposes what he calls Limited Purpose Banking. The idea is that financial institutions would be structured as a set of closed end funds, closely monitored by regulators, with each having a relatively limited set of activities. If these funds have primarily linear sharing rules, or if they invest only in cash and safe securities, then bankruptcies and bailouts can be avoided, and incentives are not distorted even if these funds are quite large. Such funds would essentially have 100% capital, and are similar in spirit to the extreme version of our proposal. If leverage is allowed, then unless capital requirements are set, which is not envisioned in this structure, it is critical that the activities of the funds are restricted and tightly controlled so that risk shifting and other incentive issues do not arise, and so they do not become too big to fail.

¹² Acharya and Richardson (2009) make similar observations.

4. Monitoring and Corporate Governance

Since our proposal is guided by the notion that debt can potentially serve as a disciplining device for managers, we now address the issue of whether the proposed structure allows debt to deliver the same or better discipline as it does in the conventional structure, and whether anything is gained or lost regarding the incentives and ability of the different capital providers (debt and equity) to monitor managers.

The ELC in our structure exists only to monitor and maintain the liabilities and payouts of the FI. To maintain the disciplinary impact of debt at the FI level, it is important that the ELC is a separate entity from the FI and that FI managers do not have direct access to ELC funds. Clearly, decisions made by the FI must be coordinated with the ELC so as to maintain the capital regulation guidelines that are imposed on the overall structure. If the FI takes any actions that increase its overall exposure, this can only be done in the context of these constraints and regulations.

In terms of the ability of debt to provide discipline, note that the debt issued by the FI in our structure still represents hard, contractual obligations. However, whereas in a conventional structure debt obligations must be paid directly from the operational assets of the FI, in our structure it is possible for these obligations to be paid by selling safe assets in ELC. It might be thought that, because of the presence of safe liquid assets to back up the FI debt, debt in our structure does not discipline managers as well as the threat of bankruptcy, and that the “hardness” of the obligation may not be as great here as it is with liabilities under a traditional structure. However, note further that for the financial institutions that our structure would potentially be applied to, which are “too big to fail,” the riskiness of the debt per se, i.e., the explicit threat of a bankruptcy, is by definition not quite relevant as a disciplining device. Rather, as Jensen (1989) envisions it, the disciplinary role of debt is based on the fact that it involves contractual commitments that are somehow hard for managers to break. For the FI debt to provide similar discipline under our structure as it does in the conventional structure, the managers of the FI must want to avoid being in situations where they must ask the ELC to use its assets to cover the contractual obligations of the FI. Such a request, which is in many ways equivalent to asking for new equity to be issued, would trigger a process akin to “costly state verification,” whereby the ELC examines the source of the distress and determines whether the request is legitimate and not due to excessive risk taking or any “stealing” by the manager. Additional information generated in this process allows the design of properly harsh consequences for the manager for suboptimal decisions. This process can therefore discipline managers as effectively, and potentially more effectively, than standard debt contracts in a conventional structure of large FIs. And it does not rely

on an extremely costly bankruptcy process, which anyway is less relevant for FIs that are “too large to fail.”

Note that our structure also has the potential to improve incentives through the way compensation is structured. For example, we envision that part of the managerial compensation at the FI will be in the form of ELC equity. This would provide managers with incentives that are more aligned with the total value of the FI. Among other things this will reduce managerial incentives to take excessive risk.

Another governance issue has to do with the incentives and ability of various capital providers to observe and possibly control managerial actions. Under a conventional structure, there are two types of managerial actions that debt holders might monitor if they have the ability to do so. First, there are actions that affect the value of the enterprise, which are of interest to both equity holders and debt holders. For example, a manager who diverts or wastes free cash flow adversely affects both equity holders and debt holders. Second, managerial actions can shift the risk of the assets or otherwise benefit shareholders at the expense of debt holders (e.g., paying dividends when the firm is distressed, undertaking risky investments, etc). To the extent that debt covenants and costly monitoring by debt holders are addressing the latter concerns, they are not necessarily useful for enhancing the total value of the FI, and are in fact a source of inefficiency.

In fact, we argue that overall monitoring incentives would not be reduced under our proposed structure. Note that, in general, monitoring incentives are distributed between debt holders and equity holders. Equity is obviously most vulnerable to managerial actions, because its claim bears the residual risk. If there is a possibility of default, the total risk is divided such that, for example, if asset value is reduced by \$1, equity value might fall by \$0.8 while debt would fall by \$0.2. Under our structure, the debt has little or no risk (depending on whether the ELC has full or partial coverage of the liabilities), and the incentives to monitor are more concentrated with equity. This might actually be more efficient. There is no reason to believe that debt holders (especially if they are dispersed) have an advantage in monitoring over equity holders represented by a board. Moreover, in the absence of conflicts of interest (achieved through the reduction of risk through the ELC), any monitoring by equity holders is focused on disciplining managers with respect to the free cash flows of the FI, and would generally increase the total value of the FI. Such discipline can be achieved using a combination of appropriate incentive contracts, monitoring by the board, and large shareholder activism.

To summarize, it seems that the proposed structure can potentially deliver as much or better ability to monitor managers as the conventional capital structure. Even if the incentives or the ability of debt to monitor is reduced because of the existence of the

ELC, the cost of providing discipline through the use of conventional leverage with all its associated costs and externalities seems extremely high.

5. Implementation and Transition Issues

We have not yet addressed the many important issues and challenges that arise in trying to implement this proposal and in maintaining the structure. An immediate challenge is that our proposal seems to entail tying significant quantities of safe liquid assets such as treasury securities to the (increased-liability) equity of financial institutions. One might wonder whether there is sufficient supply of such assets, and whether our proposed structure would inefficiently divert these assets from other purposes. In fact, it does not appear that there are sufficient liquid riskless assets to fully back up *all* the liabilities of large financial institutions. However, the spirit and many of the benefits of our approach in reducing agency problems and negative externalities can be maintained if it is implemented in a partial way, so that the coverage provided by the ELC is not full, as outlined at the end of Section 2. This would not tie up as many of the riskless assets, and even a moderate step in this direction could be a significant improvement over the status quo.

As a back-of-the-envelope calculation, consider the following. The total dollar value of the assets of US commercial banks for the week ending December 16, 2009 was \$11,677.4 billion. At roughly the same time the total US government debt held by the public was \$7,727.2 billion.¹³ Now suppose that Tier 1 capital divided by total assets of financial institutions is 5% (as current leverage ratio regulation specifies), and that the regulator would like to increase this to 10% through an ELC structure, clearly a very substantial increase. Then the value of the safe assets, e.g., in the form of US government debt, that would need to be held by the ELCs to meet the additional capital requirement would be only 7.6% of the total of US government debt, or \$583.87 billion.

We make the following additional observations regarding the quantities of safe riskless assets that our proposed structure would “tie up.” First, the total amount of risk to be borne by investors as a whole does not fundamentally change as one rearranges the way in which financial securities are designed and held. While safe assets are tied up in the ELC, the debt of the FI becomes significantly less risky under the proposed structure, and could serve some of the purposes otherwise served by the “escrowed” safe assets. Second, in the context of large institutional investors who hold highly diversified portfolios, the fact that safe assets are institutionally tied to the equity of FIs in the

¹³ This is based on data obtained from the Federal Reserve and US Treasury websites.

manner we suggest need not affect the overall portfolio in a major way. By holding ELC equity, institutional investors would be holding a bundle of increased-liability equity of FI and safe assets. In total, this holding is not significantly different from what they would hold in a standard portfolio that resembles the market, since this is equivalent to holding the assets of the FI. Finally, to the extent that any investor would like to take on leverage, it could still be possible to take such a position by buying ELC equity on margin or trading in options on ELC shares. Private transactions of this sort would not interfere with the operations and governance of the FI.

We envision that regulators could set significantly higher capital requirements than those currently imposed on financial institutions, but that FIs could be required or encouraged to satisfy these requirements through ELC structures with substantial holdings of safe assets. Recall that among the advantages of the ELC structure is that it can avoid fire sales and also allows better control of dividend payments and retained earnings. This approach should be used at least for financial institutions that are too big or too interconnected to fail.¹⁴ The connection between the ELC and the FI, and the related governance issues and constraints on the ELC should be closely monitored by regulators to make sure the ELC serves its intended purpose.

To transition into the proposed structure, several steps are involved. First, an ELC should be formed for each participating FI. At a certain date shares in the FI, which become increased-liability securities, are exchanged for shares of the ELC. The ELC must then raise equity to purchase enough safe assets. This can be done, for example, through a rights offering. Note that, since the FI debt becomes less risky, this transition involves a possible wealth transfer from shareholders of FI to its pre-existing debt holders.¹⁵ Such wealth transfers occur on varying scales whenever capital requirements or other regulations are changed, so this problem is not unique to our approach. To handle this, the transition could be phased in as new debt is issued and structured so that most of the “guarantee” goes to new debt (which will pay for it in the pricing of new debt) and old debt does not receive much of a windfall. While the details are certainly not trivial, they should not be insurmountable. In principle, there could be some subsidy made by government to offset some of the wealth transfer since the government benefits by not having to offer implicit guarantees.

As is clear from our discussion, the proposed structure does not eliminate the need for regulation and monitoring by regulators. In addition to regulating the ELC and its

¹⁴ Of course, FIs might have incentives to operate outside the regulatory framework, and this problem is always present in the context of financial regulations. It might make sense to apply this approach to all regulated financial institutions for which capital requirements are enforced.

¹⁵ Note, however, that to the extent that the previous debt has benefitted from an implicit government guarantee, a significant portion of the wealth transfer would not be from shareholders to pre-existing debt holders, but rather from shareholders to the government (and taxpayers).

connection with the FI, there is clearly a need to monitor and control off-balance-sheet liabilities of the FI under our proposal, as there is under any proposal designed to reduce risk to the system. In principle, all liabilities should be considered when designing and regulating the amount of safe assets held in the ELC. Accounting for all the on-and-off-balance sheet liabilities of financial institutions is desirable for any capital regulation.

6. Concluding Remarks

Given the negative externalities associated with leverage of large financial institutions, it is reasonable allow them to take on leverage only if it provides legitimate benefits that cannot be achieved in other ways (and, in particular, by raising equity capital). Our proposal is designed to maintain one such benefit that has been proposed in the literature, namely the potential disciplining role of debt with respect to managers while, in effect, dramatically increasing the capital requirements for financial institutions through the capitalization of the “Equity Liability Carrier” that we propose establishing. This structure potentially allows us to “eat the cake and have it too” with respect to some of the main costs and benefits of leverage.¹⁶

It may seem that our mechanism is a cumbersome way to solve any contracting or corporate governance problems in financial institutions, but we believe that the current system is also very costly, in that it involves too-big-to-fail subsidies, increased systemic risk, and agency costs due to risk shifting and debt overhang. The mechanism we propose may be a cheaper way to alleviate these problems without putting the burden on the government and ultimately on the taxpayer. This does not mean that there are not potentially cheaper ways to solve the problem more directly through less costly corporate governance mechanisms. Effort should be put into finding what these cheaper mechanisms might be. In particular, it may be desirable to restrict some of the activities that financial institutions undertake so as to control off-balance-sheet liabilities. As should be clear from this paper and from other discussions of this topic, it is challenging to try to balance the benefits of efficient risk sharing, the desire to control the various agency problems that different capital structures give rise to, and the need to minimize or eliminate the incidence of financial crisis and bailouts that the government cannot commit to withhold. We have attempted to sort out some of the issues and make some

¹⁶ One issue we have not addressed is the possibility that asymmetric information exists between managers and investors and debt financing is preferred because of its lower information sensitivity. To the extent that the ELC structure allows a financial institution to retain its earnings within the ELC and thus avoid any abuse of funds by managers, this may reduce the need for external capital to finance growth of financial institutions. In ongoing research we are examining how asymmetric information might affect the structure proposed in this paper.

concrete suggestions. Additional research should help us to understand better the various tradeoffs.

Finally, we note that, while it is possible and even likely that there are significant governance problems within financial institutions, it is not clear to us that this is the primary reason that financial institutions should be highly levered given all the costs such leverage entails. It seems quite possible that leverage is sought by financial institutions because of tax and other subsidies, overconfidence, short term managerial incentives and other reasons that are not legitimate from a regulatory perspective. It is important to sort out and understand better what might be *legitimate* reasons for financial institutions to take on as much debt as they argue they should be allowed to take; this will help us determine how they should be regulated. Moreover, to the extent that corporate governance problems are particularly severe for financial institutions, it is important to understand why it is that appropriate contracts cannot be designed for managers of such institutions. It is quite possible that better contracts can be designed if financial institutions are not as highly levered, or if their equity has increased liability as suggested here.

References

Acharya, Viral and Matthew Richardson (2009) “Contingent Capital,” Chapter 9 in *Real-time Recommendations for Financial Reform*, e-book, NYU Stern.

Diamond, Douglas W. (1984), “Financial Intermediation and Delegated Monitoring,” *Review of Economic Studies*, Vol. 51, 393-414.

DeMarzo, Peter and Yuliy Sannikov (2006), “Optimal Security Design and Dynamic Capital Structure in a Continuous-Time Agency Model,” *Journal of Finance*, Vol. 61, pp. 2681-2724.

Easterbrook, Frank and Daniel R. Fischel (1985), “Limited Liability and the Corporation,” *University of Chicago Law Review*, 52, 89-117

Easterbrook, Frank and Daniel R. Fischel (1991), “The *Economic Structure of Corporate Law*,” Harvard University Press.

Elliot, Douglas J. (2009), “Bank Capital and the Stress Tests,” Working paper, Initiative on Business and Public Policy at Brookings.

Esty, Benjamin C. (1998), “The Impact of Contingent Liability on Commercial Bank Risk Taking,” *Journal of Financial Economics*, 26, 189-218.

Flannery, Mark J. (2005), “No Pain, No Gain? Effecting Market Discipline via Reverse Convertible Debentures,” Chapter 5 of Hall S. Scott, ed. *Capital Adequacy Beyond Basel: Banking Securities and Insurance*, Oxford: Oxford University Press.

Gale, Douglas and Martin Hellwig (1985), “Incentive-Compatible Debt Contracts: The One-Period Problem,” *The Review of Economic Studies*, Vol. 52, pp. 647-663.

Grossman, Richard S. (2001), “Double Liability and Bank Risk Taking,” *Journal of Money, Credit and Banking*, 33, 143-159.

Grundfest, Joseph A. (1992), “The Limited Nature of Unlimited Liability,” *Yale Law Journal*, 102, 387-426.

Hansmann, Henry and Reinier Kraakman (1991), “Toward Unlimited Shareholder Liability for Corporate Torts,” *Yale Law Journal*, 102, 437-436.

Hansmann, Henry and Reinier Kraakman (1992), "Do the Capital Markets Compel Limited Liability? A Response to Professor Grundfest," *Yale Law Journal*, 100, 1879-1934.

Hart, Oliver and Luigi Zingales (2009), "A New Capital Regulation for Large Financial Institutions," Working paper.

Jensen, Michael C. (1989), "Eclipse of the Public Corporation," *Harvard Business Review*, September-October 1989, 61-74.

Kashyap, Anil K., Raghuram G. Rajan, and Jeremy C. Stein (2008), "Rethinking Capital Regulation," September 2008, prepared for Federal Reserve Bank of Kansas City Symposium.

Kotlikoff, Laurence J. (2010), "*Jimmy Stuart is Dead: Ending the World's Financial Plague Before it Strikes Again*," John Wiley & Sons, Inc., Hoboken, NJ, forthcoming.

Macey, Jonathan R. and Geoffrey P. Miller (1992), "Double Liability of Bank Shareholders: History and Implications," *Wake Forest Law Review*, 27, 31-62.

Macey, Jonathan R. and Geoffrey P. Miller (1993), "Double Liability of Bank Shareholders: A Look at New Data," *Wake Forest Law Review*, 28, 933-941.

Philippon, Thomas and Philipp Schnabl (2009), "Efficient Recapitalization," Working Paper 14929, National Bureau of Economic Research, April.

Squam Lake Group (2009), "Reforming Capital Requirements for Financial Institutions," Working Group on Financial Regulation," Working Paper, April.

Stulz, M. Rene (1990), "Managerial discretion and optimal financing policies," *Journal of Financial Economics*, 26, 3-27.

Winton, Andrew (1993), "Limitation of Liability and the Ownership Structure of the Firm," *Journal of Finance*, 48, 487-512.