

**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 equity financing is “expensive,” and that increased capital requirements will increase the cost of credit. Public subsidies of debt financing through tax shields and implicit guarantees may make equity “expensive” but do not make sense given the negative externalities associated with leverage. Some have suggested that debt serves to discipline bank managers who would otherwise make suboptimal or wasteful investment decisions. We propose a way to maintain a high level of contractual debt liabilities on the balance sheets of financial institutions, while at the same time increasing the capital available to support the liabilities. This can be achieved by increasing the liability of the equity of the financial institution and placing it in a separate “Equity Liability Carrier” that also holds safe assets. This reduces fragility and the need for bailouts, and alleviates distortions due to conflicts of interest between debt and equity. We discuss the potential for such structures to address governance issues within financial institutions.

**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

Most discussions of the capital structure of financial institutions (hereafter FIs) seem to take the following as axiomatic:

- 1) The high degree of leverage used by FIs is associated with significant negative externalities.
- 2) Equity is an “expensive” form of capital and must be used sparingly.

These two propositions – “Leverage is Bad” and “Equity is expensive” – lead to an apparent tradeoff, and optimal capital 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. In this paper we ask whether there is a financing structure that can allow FIs to maintain a high degree of leverage that creates substantial contractual debt commitments, while at the same time eliminating or reducing the costs and distortions associated with high leverage, including bailouts and the various agency costs of debt.

Some of the debt undertaken by FI’s, such as demand deposits, is obviously essential to their production functions, which include providing liquidity and maturity transformation. But it seems that FI’s often 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. For example, the most recent balance sheet of Wells Fargo Bank lists about \$204 billion in long term debt (out of approximately \$1,244 billion in total book value of assets), and the Citigroup balance sheet includes about \$365 billion in long term debt (out of about \$1,857 billion in total book value of assets). Our aim in this paper is to identify some of the tradeoffs associated with the capital structure of FIs as viewed from the public’s perspective, and in particular to focus on addressing the agency costs associated with debt and with equity.

Modigliani and Miller’s irrelevance results show that in a perfect market, i.e., one with no agency costs or other frictions, equity is neither “expensive” nor “cheap,” since a firm’s total cost of capital 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, and this increase offsets the lower return required on the incremental debt that is used to increase 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.*<sup>1</sup> 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.<sup>2</sup> As more equity is issued, the cost of equity (measured by required return) decreases because equity that is less leveraged is less risky.

From a public policy perspective, one of the most significant potential costs of high 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 and the un-priced insurance created by implicit government guarantees give the shareholders and management of FIs incentives to take on risk.

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, other things equal, an increase in the riskiness of the firm’s assets increases the value of that option. Intuitively, higher riskiness allows the equity holders to realize benefits on the upside, while 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.<sup>3</sup>

In addition to risk shifting considerations, high leverage can lead to the so-called “debt overhang” problem, which occurs when equity holders of a distressed firm do not

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<sup>1</sup> The notion that the discussion of capital requirements should start from the Modigliani and Miller propositions is discussed in King (1990), Schaefer (1990) and Hellwig (2009, particularly Section 4.11).

<sup>2</sup> 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.

<sup>3</sup> 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. This is discussed in Section 5.

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.<sup>4</sup>

One reason that equity is considered an “expensive” form of capital is that government policy effectively subsidizes debt and thereby makes it relatively cheap. First, there is the standard tax shield associated with the deductibility of interest payments. Second, for financial institutions deemed “too big to fail,” debt funding is effectively subsidized through the implicit guarantees associated with government bailouts, which provide 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. While this is not the focus of this paper, we note 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.<sup>5</sup>

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

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<sup>4</sup>For evidence consistent with debt overhang during the crisis see Ivashina and Scharfstein (2009)..

<sup>5</sup>This point was recently made in Poole (2009).

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.”

Hart and Zingales (2009) capture this disciplining role of debt in a model where the manager of the financial institution “steals” a fraction of the cash flow that is not paid to debt holders.<sup>6</sup>

In Section 2 below, we propose a mechanism that allows FIs to maintain a high degree of leverage (i.e., contractual debt commitments) on their own balance sheet, while at the same time reducing many of the costs and distortions associated with high leverage. Essentially, we devise a way to increase the liability of the equity issued by the FI by creating a separate entity that holds the equity of the FI and also maintains additional cushion to back up the FI liabilities.

Our proposal is different in important respects from some of those made recently in the context of bank capital regulation, such as increasing capital requirements, using reverse convertibles, or requiring 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 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 (1991, p. 40).<sup>7</sup> Our proposal is based

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<sup>6</sup> 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 (1985). These models, however, and recent dynamic agency models such as DeMarzo and Sannikov (2006), are focused on the interaction between an entrepreneur and a capital provider, and not on the interactions between managers and dispersed equity holders, particularly those of large FIs. Another class of models, e.g., Calomiris and Kahn (1991) and Diamond and Rajan (2000), focus on the role of demandable and short term debt in the context of banks. We will discuss monitoring and governance issues in more details in Section 4.

<sup>7</sup> In fact, unlimited shareholder liability was the rule in Britain until the middle of the 19<sup>th</sup> century, and double liability was the rule for nationally chartered banks in the US until the early 20<sup>th</sup> 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), and Macey and Miller (1992, 1993). 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

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.<sup>8</sup>

To understand our approach, first consider the following thought experiment: imagine (for illustrative 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 those 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 would be riskless, and the default option that is associated with limited-liability equity would disappear. Moreover, the various agency problems associated with debt would also disappear, and investment decisions would maximize the firm value. Equity holders with unlimited liability would not have incentives to engage in risk shifting, because they would bear the full cost of unfavorable outcomes. In addition, debt overhang issues would not arise, because the full net present value of any project would accrue to equity. In other words, since the debt becomes riskless when equity has unlimited liability and sufficient assets to cover all the obligations, there would be no conflicts of interest between debt and equity. And because there would be no bankruptcy and no debt overhang, outside entities such as the government would not be needed to inject capital upon distress, so the costs and distortions associated with bailouts would also be 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 in a straight forward way through the creation of an entity that we call "Equity Liability Carrier" (ELC). The role of the ELC is to hold the unlimited-liability equity and guarantee that the obligations of this unlimited-liability equity can be met. The *limited*-liability equity that will be issued by the ELC to fund its holdings will be publicly owned

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the discussion in the law literature was focused on tort liabilities and not on the liabilities associated with leverage.

<sup>8</sup> 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.



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-liability equity for the FI, while at the same time limiting the liability of any investor to the amount invested.<sup>9</sup> Consider a financial institution with liabilities whose face value is equal to  $F$ .<sup>10</sup> 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  $F$ .<sup>11</sup>
  - b. The ELC is financed only with standard, limited-liability equity.
3. The unlimited-liability equity of the FI cannot be held outside the ELC ownership structure.

This structure is illustrated in Figures 1 and 2 and the rules that govern the structure are discussed later. 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 the 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. And the value of debt with the same face value is obviously greater when equity has unlimited liability than when it has limited liability.<sup>12</sup>

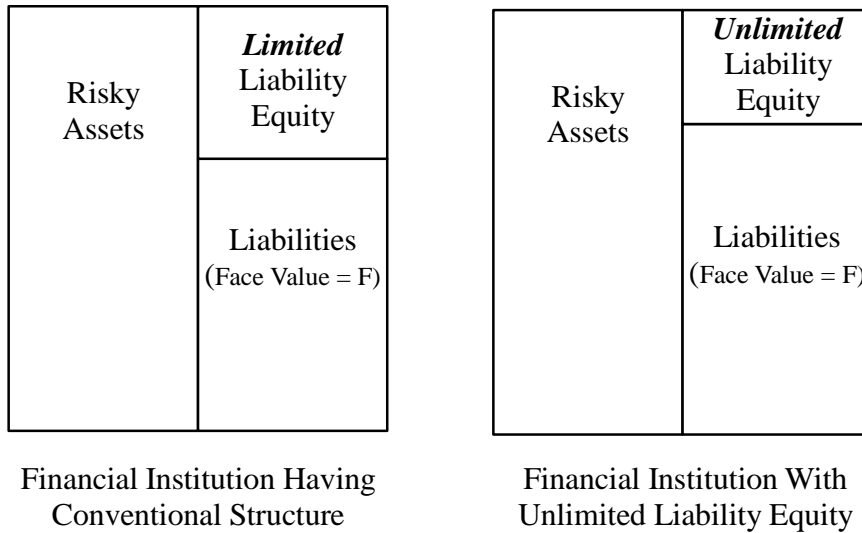
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<sup>9</sup>Our discussion here is focused on what can be considered the extreme version of our proposal, in which the liability of the equity issued by the FI becomes completely (i.e., 100%) unlimited. Later in the section we will describe less extreme versions that may achieve most of the goals of the extreme version, but which would be easier to implement.

<sup>10</sup> 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.

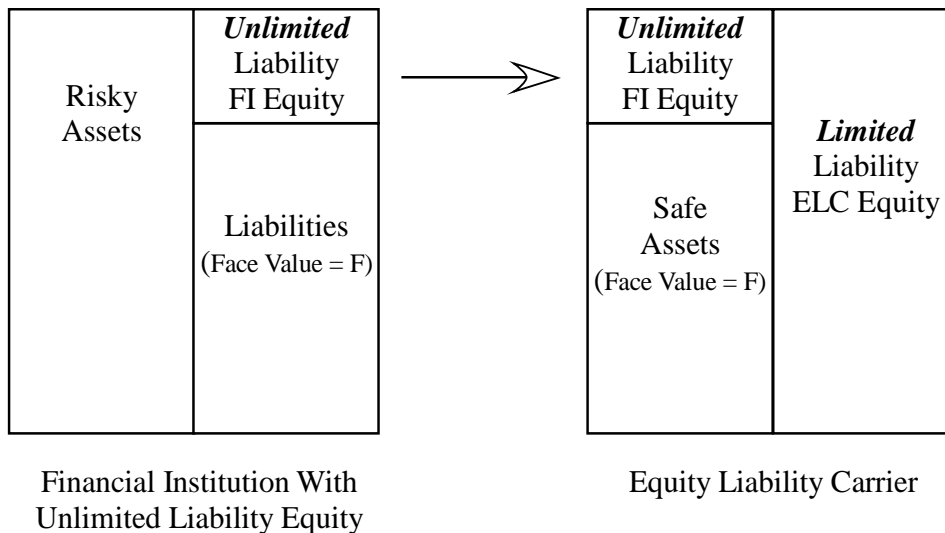
<sup>11</sup> Although we measure the bank’s liabilities by a single face value, we recognize that in practice there is a maturity structure to bank liabilities. In the most extreme version of our proposal we would have the maturity structure of the liabilities be matched to the safe asset holdings.

<sup>12</sup> 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



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

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.

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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.

The relations between the FI and the ELC should be subject to strict regulatory constraints intended to maintain the intended coverage of the FI liability by the ELC. In the extreme version of our proposal, this would work by requiring that any funds transferred from the ELC to the FI do not lead to a decrease in the available cushion. Formally, let  $F_I$  be the face value of the liabilities of the FI and  $F_{ELC}$  be the face value of the safe assets held by the ELC and define  $S = F_{ELC} - F_I$ . Then financial regulation would require that  $S$  must be at all times non-negative.<sup>13</sup> In particular, (i) the ELC can only make cash distributions to its shareholders if these payments are not larger than  $S$ ; (ii) Funds can be transferred from the ELC to the FI only if they are used to pay down liabilities or they are not larger than  $S$ , and (iii) The FI can raise debt 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 this 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 that 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 can be maintained at the FI level.<sup>14</sup> We will discuss monitoring and corporate governance issues in Section 4.

Note that our structure can also address the “fire sale externality” and “credit freeze” 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

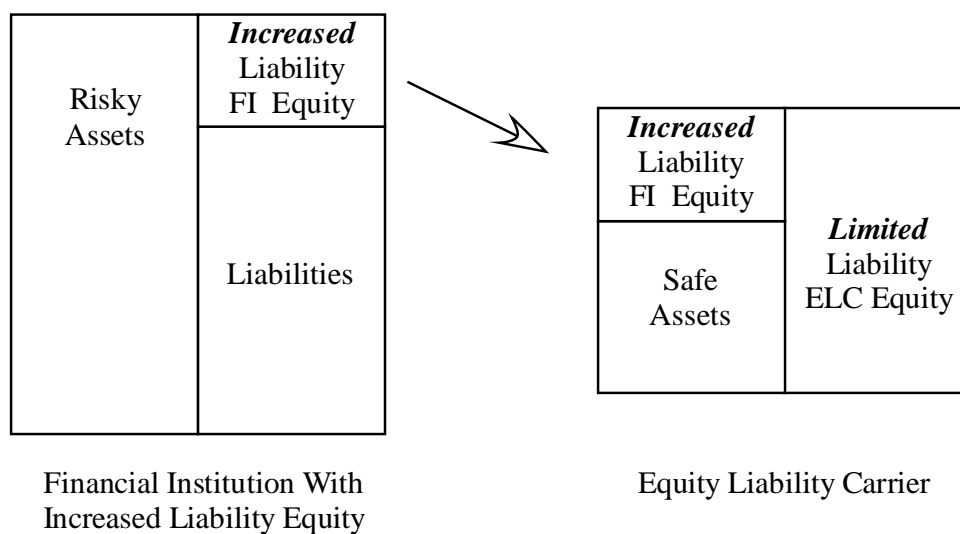
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<sup>13</sup> If  $S$  becomes negative, then a corrective action must be taken, such as the FI paying down debt from its own reserves or the ELC issuing new equity and acquiring sufficient safe assets until  $S$  is non-negative.

<sup>14</sup> 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).

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. 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. It is possible to maintain the spirit of the proposal with a partial implementation that simply allows FIs to meet increased capital requirements through the ELC while maintaining a high level of leverage on their balance sheets. That is, rather than have the equity cushion exist entirely on the FI balance sheet, part of the cushion can be put in place at the ELC. Capital requirements could therefore be increased significantly, with FIs being allowed to satisfy them through an ELC structure. Similar to current capital requirements, the amount cushion held in the ELC would depend on the riskiness of the assets and other characteristics of the FI's balance sheet. (We will discuss implementation issues further in Section 5.) 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.<sup>15</sup> Assume further that the FI desires its equity (at the FI level) 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

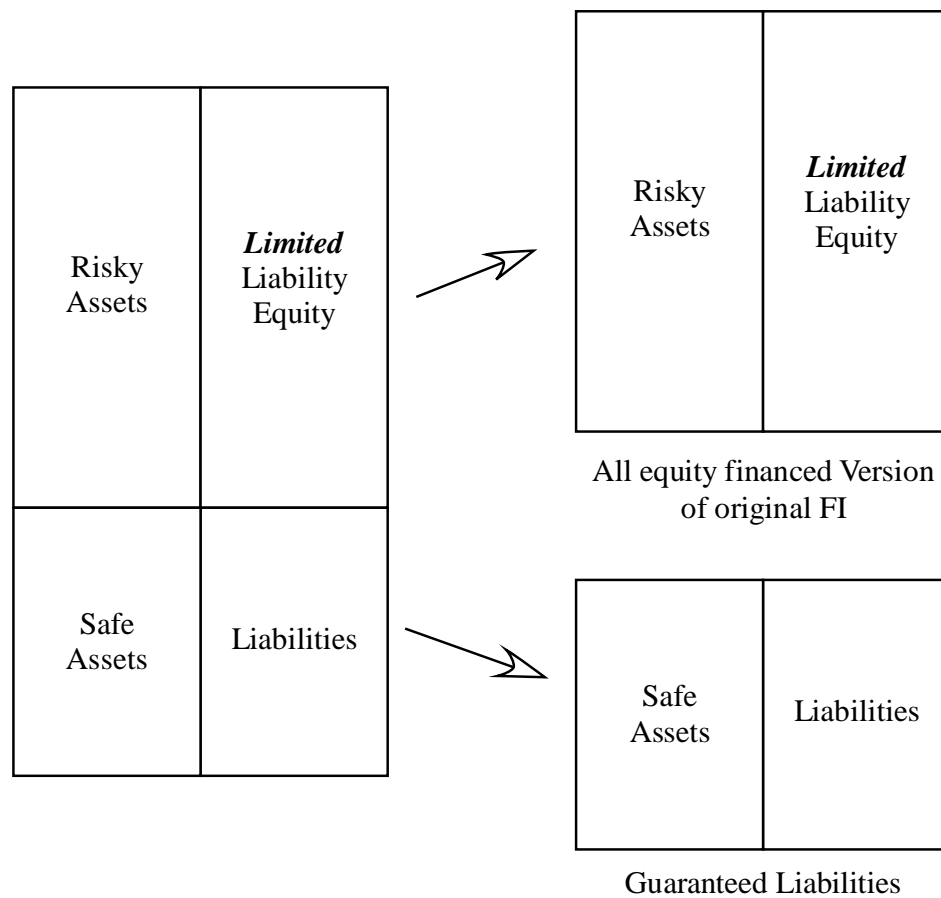
Since our proposal calls for essentially “backing up” the liabilities of the FI with safe liquid assets, it seems at first that it is equivalent to simply requiring the FI to hold a large amount of safe liquid assets on its balance sheet. In fact, doing so would not address the problems our structure 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

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<sup>15</sup> 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.

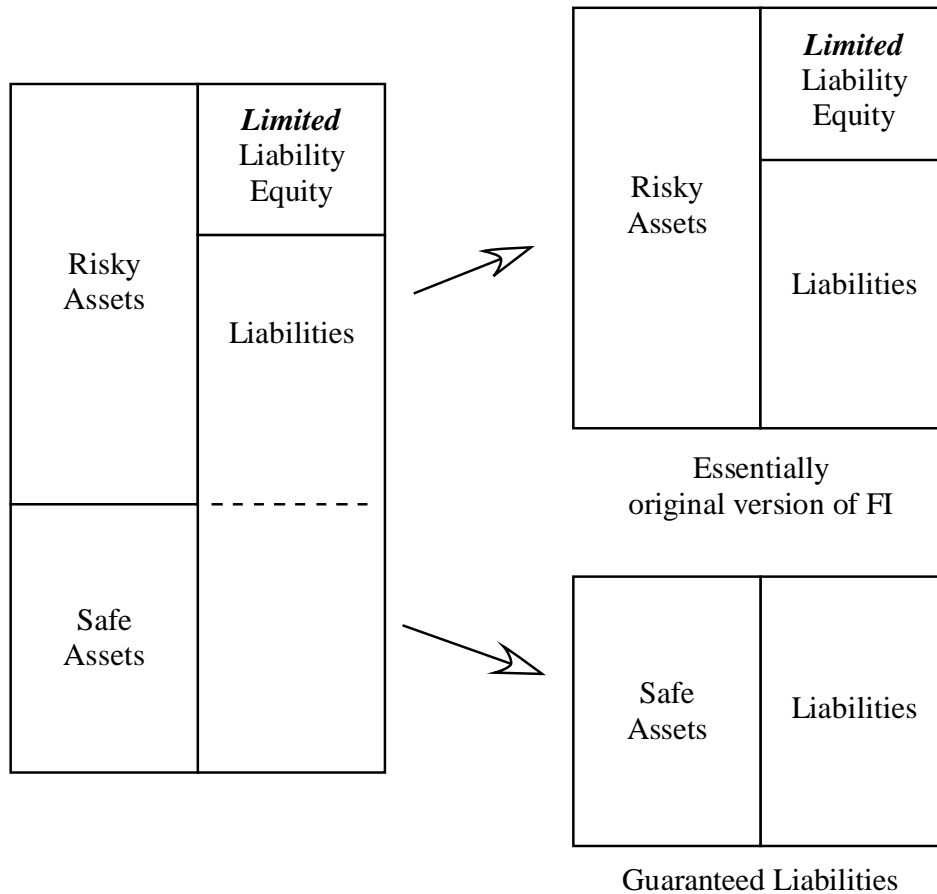
change the face value of the liabilities of the FI. As Figure 4 shows, this gives rise to the same “free cash flow” agency problem that would arise if the bank were financed entirely with equity. The FI’s balance sheet effectively decomposes into two pieces. The safe assets are held as collateral against 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 (2009) 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 some risk from the government to holders of the reverse convertibles. Of course, reverse convertibles holders must be compensated for bearing the additional risk and this additional cost will be ultimately borne by the shareholders. If reverse convertibles replace straight debt, then this would reduce the possibility of default and need for bailouts. However, depending on the overall leverage of the FI and how capital regulations treat reverse convertibles (e.g., whether they are

considered equity capital for the purpose of capital regulation), risk shifting and other agency problems can be exacerbated under this structure.<sup>16</sup> Given this possibility, reverse convertibles may not be as effective as our proposed structure in reducing agency problems and the resulting distortions in investment decisions that are due to leverage.

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 a crisis. The payout on this insurance will be made secure by requiring that the provider set 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. Providing insurance through the private sector rather than through implicit, too-big-to-fail government guarantees is quite desirable. However, since the insurance is provided by a distinct entity that is not directly owned by the shareholders owning the FI, the moral hazard problems and agency costs associated with insurance remain. The proposed ELC structure essentially requires that shareholders *self insure* and places their money in escrow (in the form of safe assets held by the ELC) to make sure that the self insurance will be effective. This greatly reduces the moral hazard problems associated with insurance, which are related to the incentives for the shareholders to increase risk.

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. Note that this proposal amounts to increasing the effective liability of equity, since equity holders are forced to put up more capital to cover debt obligations whether or not it is in their interest to do so. The main difference between our proposal and that in Hart and Zingales (2009) is that in our approach the capital cushion is set aside upfront; we do not envision a process in which a regulator must force equity holders to invest additional funds 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 primarily have 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. If leverage is allowed, then unless capital requirements are set, 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. Clearly, reducing leverage,

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<sup>16</sup> Acharya and Richardson (2009) make related observations.



controlling the assets financial institutions are permitted to buy, and providing information and enforcement of contracts can all be beneficial, and complement our approach. Our proposal is less radical and is meant to reduce the distortions and costs associated with leverage of FIs. Controlling the riskiness of FIs' assets is important to our approach, as it is to any capital regulation.

## 4. Monitoring and Corporate Governance

We now address the issue of whether our proposed structure delivers the same or better discipline as does debt in the conventional structure, and whether anything is gained or lost regarding the incentives and ability of the different capital providers to monitor managers.

The ELC in our structure exists only to monitor and maintain the liabilities and payouts of the FI. To provide useful governance and maintain the intended function of the ELC, it is important that it is a *separate* entity from the FI and that FI managers do not have direct access to ELC funds. Any payout and financing decisions must be made jointly by the FI and the ELC so as to maintain the capital regulation requirements that are imposed on the overall structure.<sup>17</sup>

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. To some extent this may be true. However, note that if institutions reach the level of being “too big to fail,” the riskiness of the debt per se and the explicit threat of a bankruptcy is less relevant as a disciplining device. Note also that, as Jensen (1989) envisions it, the disciplinary role of debt is based on the fact that it involves contractual commitments that are hard for managers to break without consequences. 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

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<sup>17</sup> Since the ELC does not engage in any investment decisions beyond holding the increased-liability equity of the FI and safe liquid assets, its managers and board do not have much discretion and thus its establishment should not give rise to any new and significant agency problems.

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 potentially discipline managers as effectively, and perhaps more effectively, than standard debt contracts in a conventional structure of large FIs. Most importantly, it does not rely on a costly bankruptcy process, although as noted above bankruptcy 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 concerns 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 total 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. Indeed, the costs associated with this type of monitoring are a component of the agency costs of debt.

There are several reasons to conclude 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. For example, if asset value is reduced by \$1, equity value might fall by \$0.8 while the value of (risky) debt would fall by \$0.2. Under our structure, the debt has less risk, the incentives to monitor are more concentrated with equity. This might actually be more efficient. There is no reason to believe that dispersed debt holders have an advantage in monitoring over equity holders represented by a board. Moreover, reductions in the conflicts of interest between claimholders achieved through the reduction of the risk of debt under the ELC structure means that most monitoring that will be undertaken will be focused on increasing 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.

Some models of the disciplinary role of debt in the context of financial institutions are based on the idea that the fragility of demandable debt (or short term debt that must be rolled over frequently) is itself the main mechanism by which debt disciplines managers. For example, Calomiris and Kahn (1991) argue that demand depositors have incentives to monitor managers in order to know when to withdraw their funds. Their model is predicated on the assumption that the manager can abscond with funds and is more likely to do so in bad states. When the information gathered by depositors indicates that the bad state is realized, they are able to force liquidation before the manager can abscond. Diamond and Rajan (2000) assume that debt holders, because they have a credible threat to liquidate the bank, are in a better bargaining position than are equity holders in negotiating with managers, and thus are less subject to a hold-up problem in which managers extract surplus generated by their unique expertise. Since our approach is designed in part to reduce the fragility of financial institutions, it would be harder to deliver discipline through fragility in our structure. Note that the alternative approaches discussed in the previous section, including increased capital requirements, reverse convertibles, capital insurance, and capital calls based on CDS prices, also have the effect of reducing the fragility of financial institutions. Thus, discipline that is based on fragility would potentially be weakened with all of these proposals. It is not clear, however, that for large FIs, particularly those considered “too big to fail,” the models of discipline that are based on capital fragility capture the relations between managers and capital providers.

To summarize, the proposed structure can potentially deliver as much or better ability to monitor managers as the conventional capital structure. Even if it falls short of doing so, it may still be preferred over the conventional structure, which is associated with significant negative externalities.

## **5. Implementation and Transition Issues**

An immediate challenge to the implementation of our proposal is that it seems to entail tying significant quantities of safe liquid assets such as treasury securities to the (increased-liability) equity of financial institutions within the ELC. 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.<sup>18</sup> Now suppose that Tier 1 capital divided by total assets of financial institutions is 5% (as current leverage ratio regulation specifies), and that this is increased to 10% but FIs are allowed to place the capital cushion in an ELC structure. 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 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

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<sup>18</sup> This is based on data obtained from the Federal Reserve and US Treasury websites.

or too interconnected to fail.<sup>19</sup> 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 the shareholders of FI to its pre-existing debt holders.<sup>20</sup> 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 connection with the FI, there is also a need to monitor and control off-balance-sheet liabilities of the FI. This is true under any effective capital regulation plan. In particular, all liabilities should be considered when designing and regulating the amount of safe assets held in the ELC. Moreover, capital regulation must be coordinated globally so as to prevent “regulatory arbitrage” by financial institutions.

## 6. Concluding Remarks

Given the negative externalities associated with leverage of large financial institutions, it is reasonable to allow them to take on leverage only if a highly-levered capital structure provides legitimate benefits that cannot be achieved in other ways (and, in particular, by raising equity capital). Our proposal is designed to reduce some of the adverse effects of high leverage while maintaining one potentially legitimate benefit of high debt level that has been proposed in the literature, namely the possible role high

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<sup>19</sup> 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 financial institutions for which capital requirements are important.

<sup>20</sup> Note, however, that to the extent that the previous debt has benefited 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).

levels of debt can play in disciplining managers. In particular, we show how it is possible to maintain the contractual obligations of debt and at the same time effectively increase capital requirements through the establishment of what we call an “Equity Liability Carrier.” At least in some respects this structure might allow us to “eat the cake and have it too.”<sup>21</sup> Our proposed structure increases the liability of the equity of financial institutions by attaching the equity to safe liquid assets. This should not cause major changes in the overall ownership structure of financial assets, and at the same time it should address the potentially severe agency problems that the current structure entails.

Identifying the legitimate reasons for financial institutions to be highly leveraged is clearly of central importance for determining how capital regulation should be designed. While disciplining managers is often mentioned as a reason for the high degree of leverage of financial institutions, it is not clear to us that this is the primary reason that they are so highly leveraged or that the disciplining benefits of leverage outweigh its social costs due to the negative externalities that leverage entails. It seems quite possible that financial institutions maintain high degrees of leverage because of reasons related to the tax shield generated by debt financing, “too-big-to-fail” insurance subsidies that make debt financing cheap, the potentially perverse incentives created by managerial compensation schemes that encourage leverage, and managerial overconfidence that leads managers to underestimate risk and overestimate returns. None of these reasons is associated with legitimate benefits that justify the aforementioned costs and negative externalities.

We finally note that, to the extent that financial institutions face particularly severe governance problems, one might question why efficient contracts have not emerged that do not involve extreme and costly levels of leverage. Part of the reason may be that the costs, especially those related to systemic risks, are not directly borne by the shareholders. A contract with managers that is privately efficient to the equity holders of financial institutions is quite likely to be socially inefficient in this case. Further research should be focused on identifying with more precision the nature of the governance and agency problems of financial institutions and determining efficient ways to address them from a social welfare perspective.

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<sup>21</sup> 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 and trying to analyze more fully the tradeoffs (from a public policy perspective) associated with capital structure of FIs.

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