

INTERCONNECTEDNESS AND CONTAGION

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Committee on Capital Markets Regulation*

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EXECUTIVE SUMMARY

This paper has been prepared to stimulate discussion and does not represent the views of the Committee on Capital Markets Regulation or its Director. While it may seem to take positions on some issues, this is intended only to provoke discussion. The Committee may, however, decide to take a position on these issues in the future after receiving feedback on this paper.

The paper presents several distinct areas of concern regarding systemic risk: asset interconnectedness, liability interconnectedness and contagion, in the context of the insolvency of Lehman Brothers, and the ensuing financial crisis. Asset interconnectedness is the concern that the failure of one financial institution will directly cause the collapse of other financial institutions that have direct credit exposures to the first failed institution. Liability interconnectedness is the idea that one institution that is a source of short-term funding to other institutions will stop funding those institutions, thus causing the failure of the other institutions. Contagion involves run behavior whereby funding is withdrawn from banks and other financial institutions as a result of a fear of widespread impending failure.

The systemic risk concerns posed by asset interconnectedness can be viewed through a detailed analysis of the Lehman insolvency and the impact of Lehman's insolvency on its creditors, including derivatives counterparties, prime brokerage clients, structured securities investors, and investors in money market funds that held Lehman debt. Evidence suggests the direct impact of Lehman's collapse on these counterparties was not as problematic or destabilizing as many feared it would be. In fact, no major financial institution failed as a result of its direct exposure to Lehman Brothers. Analyzing the potential impact of the AIG insolvency is also informative, as a similar conclusion follows: had AIG not been bailed out, direct losses imposed upon its counterparties would not have been a major problem either. The conclusion of each of these analyses is that given the relatively modest levels of losses involved, asset interconnectedness on its own was not a primary cause of the global financial crisis.

Lehman Brothers Holdings Inc. (LBHI), the parent holding company, filed for bankruptcy protection on September 15, 2008, despite the firm's last reported solvency. On a consolidated basis, Lehman had reported \$639 billion of assets and \$613 billion of liabilities in

its audited financial report as of May 31, 2008. Nonetheless, in the days leading up to the filing, Lehman faced a severe liquidity crisis. It faced increased collateral requirements and its cash was quickly drained. The firm had reached this point largely because it had followed an aggressive growth strategy since 2006 and committed increasing capital to commercial real estate, leveraged loans, and illiquid private equity investments. When these markets began to show weakness in 2007, the firm's management appeared to make a decision to "double-down" on these asset classes. This decision proved extremely costly and left Lehman an undesirable acquisition target, at least as compared to Bear Stearns.

In addition to LBHI's filing, various U.S. and non-U.S. Lehman affiliates entered into similar insolvency proceedings. Lehman Brothers International (Europe), for example, the European broker-dealer subsidiary of LBHI, was placed into administration on September 15th. Four days later, Lehman Brothers Inc., the U.S. broker-dealer, was placed into liquidation under the Securities Investor Protection Act. Eventually, more than 20 Lehman affiliates would file for bankruptcy protection in the United States. After April 2010, when the Lehman estate offered a first plan of liquidation, numerous proposals by both the estate and groups of creditors followed. On August 31, 2011, the estate filed a *third* amended plan of liquidation, and as subsequently modified, it was confirmed by the court on December 6, 2011. Four months later and nearly three and a half years from the date of the filing, on March 6, 2012, Lehman finally emerged from bankruptcy as a liquidating corporation set to distribute recoveries to creditors in the months and years to come.

Despite the complexity of the bankruptcy process, evidence suggests that direct exposure of counterparties to Lehman entities that filed in the United States was not destabilizing in the immediate aftermath of Lehman's failure. This third party exposure was distributed among a large number of individuals and institutions, not all of which were systemically important. Furthermore, in measuring exposure, it is important to look beyond claims data. Claims data reflecting claims filed against LBHI and its affiliates is approximately four times higher than the most relevant real exposure figures.

Ironically, while Lehman's capital structure, specifically its significant use of secured financings as opposed to unsecured borrowing, resulted in the relatively limited amount of third-

party exposure, it also made Lehman more vulnerable to failure. Lehman was extensively reliant on short-term funding, particularly through repos, and consequently it suffered a liquidity crisis when this short-term funding became unavailable. Had Lehman been more reliant on long-term, unsecured debt, it may have been less likely to fail in the first place, although third-party exposure would have been greater in that event.

While direct exposure to Lehman through asset interconnectedness did not prove to be as problematic as feared, Lehman's collapse did have significant effects. The failure of Lehman sent a signal to the market that an implicit government backing of large financial institutions was no longer reliable. The subsequent removal of this public backstop, along with overall uncertainty about the *potential* risks of asset interconnectedness, spurred a contagious liquidity crisis in the short-term funding market. It was this crisis that rapidly spread and ultimately required containment by government intervention. This liquidity crisis was not a result of asset interconnectedness, but rather was a prime example of financial contagion.

Asset interconnectedness is also considered to have motivated the U.S. government's capital injection into AIG. It was widely believed that AIG had been rescued because of the direct exposure faced by other important financial institutions through derivatives products held with AIG as counterparty. AIG's credit default swap (CDS) portfolio did in fact contribute to the firm's failure, as CDS on multi-sector CDOs were the source of significant losses. However, even if AIG had not been saved, counterparty losses from this exposure would have been manageable for several reasons: first, some of the exposure was collateralized, as AIG's multi-sector CDS portfolio accounted for about 96% of the \$13.8 billion in collateral that the firm had posted as of June 2008 and it posted roughly \$5 billion more by the time of the bailout; second, counterparties conducted their own hedging activities to mitigate loss from any collateral shortfall, such as Goldman Sachs, for example, who claimed to have hedged all of its AIG credit risk through CDS purchases on AIG; and finally, the notional value of the overall CDS portfolio was relatively small and risk was spread across a number of firms, so no counterparty would have lost more than one-fifth its equity even under the most adverse of scenarios. Thus while it is clear that derivatives contributed to AIG's failure, there is no substantial evidence that its failure would have put AIG's counterparties at risk of insolvency. Rather, as the Federal Reserve explained in justifying its aid to AIG at the time, a failure of AIG would have added to already

significant market fragility. This fragility was more a product of market sentiment than actual direct losses, further confirming that contagion posed more of a risk to the financial system than did asset interconnectedness.

Interconnectedness can also present systemic risk concerns on the liability side of the balance sheet. The effects of liability interconnectedness have been examined from the perspective of network theory in economic literature, looking at how various structures of a financial network can lead to vastly different consequences of interbank lending relationships on market participants and on network stability. Studies considering both direct interbank lending relationships and indirect liquidity links have identified the systemic impact of various features of these networks including their completeness, complexity, level of connectedness and concentration. A significant conclusion from recent theory is that the modern financial network displays a “robust-yet-fragile” tendency: higher liability interconnectedness allows for the innocuous absorption of most shocks, thus reducing the overall probability of systemic failure; however, when low-probability high impact events do occur, such as during a crisis, the damage is more widespread than in less connected networks. Since Lehman was not a significant source of short-term funding, the loss of Lehman as a creditor did not directly lead to failures of other financial institutions through liability interconnectedness. However, as mentioned in the context of asset interconnectedness, the Lehman failure did add to overall uncertainty and panic that likely led to liquidity hoarding and contagious runs. Nor was liability connectedness otherwise a major problem in the crisis. Nonetheless, as the intensity of this contagion increased, the robustness of the network decayed. Money market mutual funds (MMMFs) are an important source of liability interconnectedness since they invest heavily in the short-term liabilities of banks. Contagious runs on MMMFs can therefore result in the withdrawal of a major source of liquidity from the banking system. To the extent that large global banks rely on this short-term funding, the liability interconnectedness of the MMMF industry is a significant source of systemic risk concern.

Several policy initiatives aim to address the systemic risk posed by interconnectedness, including Dodd-Frank requirements for central clearing, exposure limitations and minimization of concentration. Central clearing of derivatives and other financial contracts has the potential benefit of removing counterparty risk, which can stem market concerns and uncertainty

regarding asset interconnectedness through derivative exposure. However, these benefits are limited and potentially counterbalanced to some extent by lost bilateral netting benefits that result from the clearing of only certain types of derivatives. For instance, if two dealers have zero net exposure to each other by netting all of their various derivative positions, this exposure will increase if some, but not all, of those derivatives are moved to a central clearing party. Exposure limitations, required under Dodd-Frank, cap a covered company's credit exposure to an unaffiliated company at 25% of the capital of the covered company, which may be overly generous or scant depending on the counterparty. But it is not clear what these limits add to the widespread industry practice of imposing these limits out of a desire to limit risk. Finally, minimizing the concentration and size of financial institutions has been proposed, but it is unclear how such limits would alleviate real interconnectedness concerns. These policy initiatives may be helpful in addressing certain concerns raised by both asset and liability interconnectedness, and may help to quell market concerns and uncertainties that could lead to contagion (for example, through the transparency that central clearing will bring to the OTC derivatives market). However, since these initiatives primarily address concerns related to interconnectedness and not the more important general problem of contagion, they are incomplete as a solution to the problem of systemic risk.

While asset interconnectedness and liability interconnectedness were not the drivers of the systemic risk concerns during the recent financial crisis, contagion was certainly front and center. Financial contagion is the spread of run-like behavior from one financial institution to an expanding number of other financial institutions, independent of any direct interconnections or relations. Regardless of its cause, the special feature that distinguishes contagion from other causes of systemic instability in the financial system is the possibility for contagious runs to spread among institutions and markets indiscriminately, including across healthy, solvent institutions. The financial system is particularly vulnerable to contagion because of its dependence on short-term borrowing by banks and non-bank financial intermediaries. Until recently, most discussion of contagion was focused on the depository banking system and demand deposits, the principal source of short-term credit to that system. But today, non-bank financial intermediaries use short-term funding as well, and short-term funding markets for banks have expanded beyond deposits to commercial paper, asset-backed commercial paper, unsecured interbank lending, and repo lending.

The Lehman bankruptcy spurred significant contagious effects in the short-term capital markets. First, it triggered a major run on U.S. MMMFs as evidenced in the aftermath of the Reserve Primary Fund (RPF) “breaking the buck.” While the RPF faced massive investor redemptions due to losses from direct Lehman exposure, broader contagious runs also occurred across the money market mutual fund industry in institutions with no significant exposure to Lehman. Second, this contagion also spread to short-term asset-backed commercial paper markets, as MMMFs shifted their holdings to risk-free U.S. government securities. The third market affected by contagion was the interbank lending market, where LIBOR rates rose sharply and many banks simply discontinued lending to each other entirely. Finally, repo markets also felt the effects of contagion, as borrowing rates and collateral demands increased dramatically.

In the wake of the financial crisis, numerous reforms have been adopted through the Dodd-Frank Act to address systemic risk in the financial system, including capital and liquidity requirements and various resolution procedures. At the same time, many of the tools actually used in the crisis have been restricted due to the “anti-bailout consensus,” including guarantees, insurance, and capital injections. For regulation to be effective against contagion, it must induce financial institutions to internalize the systemic costs of financial intermediation, while not at the same time amplifying the risk of further contagion, e.g., by exposing short-term creditors to loss (which would internalize the cost, however, through higher funding rates). It is difficult to achieve both of these objectives.

Capital requirements, liquidity requirements, and loss-imposing resolution procedures prioritize the imposition of losses on private actors in the financial system. However, while these policies may reduce the risk of individual failures, on the whole they fail to adequately address the problem of contagious runs that can quickly spread through the financial system.

Capital Requirements

Government-imposed capital requirements have traditionally been justified as a means to mitigate the ex ante effect of regulatory safety nets, i.e., deposit insurance and discount window lending, on a bank’s risk taking and level of leverage. Under this theory, capital not only serves to stem moral hazard, but also provides a buffer against potential losses, thus reducing costs borne by the public. A capital buffer also mitigates the negative externalities that can arise even

without a public safety net. Unexpected losses and a bank's consequent deleveraging can result in the fire sale of bad assets, likely causing negative knock-on effects on otherwise healthy banks that hold similar assets. In the case of a macro shock occurring during a credit crunch, this deleveraging could further impair the health of an already weakened macro economy. However, even disregarding the arguable ineffectiveness of capital in achieving those goals (given the relatively low capital levels required by regulation), the question remains whether capital requirements sufficiently address the systemic risks posed by contagion.

The leading reform proposal for international capital regulation that has emerged from the financial crisis was developed by the Basel Committee on Banking Supervision of the Bank for International Settlements. This reform, termed "Basel III," amends the prior Basel architecture (Basel I and II) through a variety of revisions. Basel III directly increases mandatory minimum capital ratios, placing an emphasis on common equity and introducing a discretionary countercyclical capital buffer. The Basel reforms also indirectly raise capital requirements by restricting the range of instruments that qualify as Tier 1 capital and by adjusting the risk weights placed on some assets. Finally, Basel III (and Dodd-Frank) requires banks to undergo comprehensive stress-testing programs that aim to ensure that balance sheets are strong enough to endure severely adverse economic conditions.

While some critics of Basel III argue that the framework does not provide enough capital, the fact remains that leading up to the financial crisis the largest U.S. banks maintained average capital ratios 50% higher than regulatory minimums. Capital requirements are designed to achieve the dual goal of deterring runs in the first place (by assuring creditors that their borrowers are strong) and enabling an institution to withstand a run if it does occur. However, during a crisis runs may still be the rational option for short-term creditors whose investments are exposed to potential fire-sale losses. No reasonable amount of capital can absorb the losses from the fire sales of assets. Furthermore, short-term creditors may not pay attention to a firm's solvency when making a decision to run in a crisis. They do not want to stay around to find out if a financial institution has enough capital. So while capital may be helpful, it is far from a complete solution to financial contagion.

Liquidity Requirements

Liquidity requirements are meant to ensure the existence of high-quality assets that can be sold or pledged as collateral to meet sudden withdrawals of short-term funding, allowing institutions to survive without public liquidity support. Liquidity requirements represent a more promising approach than capital requirements, as contagion often spreads in runs that are liquidity driven. However, there are four main problems with this approach. First, most liquidity proposals (like capital requirements) apply mainly to traditional banks. Second, the stock of high-quality assets that private liquidity requirements can furnish is limited by nature, and it is always possible that disruption to the short-term borrowing markets could overrun even the strongest portfolio of liquid assets. Third, assets suited to meet these requirements will be costly to financial institutions and to the economy, in turn lowering the amount of new credit these institutions can create and raising the overall cost of capital to the real economy. Fourth, securing emergency liquidity to the financial system through private reserves that must be constantly maintained to survive irrational runs may be far less efficient than the traditional use of a central bank lender of last resort.

Among the various liquidity reforms are proposals by the Basel Committee and the U.K. Financial Services Authority. The Basel Committee announced new liquidity standards that introduce a short-term measure requiring financial institutions to hold sufficient high-quality assets to cover 30 days of net cash outflows and a long-term measure designed to secure institutions with enough liquidity support for one year. The U.K. FSA has proposed similar rules with the addition of stress-test analyses that ensure institutions develop contingency plans for navigating liquidity freeze-ups.

An alternative approach, endorsed by the U.K. Independent Commission on Banking in its “Vickers Report,” is the imposition of a short-term funding cap, which would limit the portion of a bank’s balance sheet that can be funded with short-term liabilities. The aim of this approach is to minimize the flight of short-term creditors that can leave many healthy financial institutions facing potentially ruinous liquidity crunches. While this proposal requires further analysis to gauge its effectiveness, given the role of reliance on short-term funding in transmitting contagion, funding limitations such as this may be a promising approach.

The main alternative to the above liquidity proposals is the use of emergency public lending facilities, as was done in the financial crisis, but which has been significantly curtailed by Dodd-Frank. Despite all the potential protection against liquidity-driven runs afforded by the above proposals, their effectiveness will remain limited in scope. As a result, access to central bank liquidity will continue to be necessary to protect against the problem of contagion.

Resolution Procedures

The primary goal of resolution procedures has been to provide a restructuring of financial institutions in a way that ensures continuation of essential business lines, with minimum disruption and the preservation of franchise value and low cost to the public. But from the perspective of systemic risk regulation, the protection of short-term creditors (whether or not insured) should also be a key objective of these procedures to minimize the incentives for contagious runs.

Resolution strategies include: (1) issuing contingent capital to enhance loss absorption at senior debt levels of the capital structure; (2) employing creditor bail-ins in insolvency proceedings to force loss onto debt holders without requiring a disruptive judicial or prolonged administrative proceeding; (3) ring-fencing impaired assets through good-bank/bad-bank structures; (4) instituting “living wills” as an aid to orderly wind-ups during a crisis; and (5) use of the Orderly Liquidation Authority under Dodd-Frank to resolve systemically important non-bank financial institutions.

Contingent capital refers to a group of long-term hybrid debt instruments that contain an embedded equity conversion provision that is triggered automatically after the issuer’s financial profile deteriorates below a predefined threshold. While contingent capital provides an additional level of loss absorbance, these instruments do not guarantee short-term creditors immunity to loss nor do they provide incremental liquidity in case of a crisis. Leaving short-term creditors exposed to loss in the case of an extreme shock will not prevent them from running. As a result, while contingent capital might render the financial system marginally safer, it cannot be relied upon to avoid insolvency or stop contagion.

Creditor bail-in refers to regulators forcing creditors of insolvent financial institutions to absorb losses by swapping liability claims for new equity with the purpose of recapitalizing the institution's balance sheet. Unlike the case with contingent capital instruments, conversion through bail-in is not governed by contract, so its use entails the creation of an accommodating national and cross-border legal framework. The primary consideration in regards to the potential effectiveness of bail-in is its effect on the actions of short-term creditors. A bail-in regime must be both comprehensive enough and clear enough in advance to ensure confidence of short-term creditors and not have the unintended consequence of provoking a run due to uncertainty of loss allocation.

A further consideration in regard to creditor bail-in is the transmission mechanism for transferring the newly created capital. The most likely form of bail-in will target bank holding company debt holders to create new capital. Even assuming the bail-in sufficiently recapitalizes the bank holding company, capital must be downstreamed to bank subsidiaries to ensure their capital adequacy. The cancellation of intercompany loans from the bank holding company to the subsidiary may be the optimal method for such downstreaming; however, the relative levels of these loans in the subsidiary's capital structure significantly limit this method. Half of the ten largest U.S. bank holding companies would not be able to support capital losses of greater than 25% under this transmission method.

The good-bank/bad-bank resolution procedure is a method of reorganizing a failed financial institution by reclassifying its balance sheet into two distinct "good" and "bad" asset classes. The goal of regulators is to ring-fence bad assets deemed to be impaired from good assets with the former transferred to a bad bank and the latter to a good bank. While the intention of this procedure is to raise investor confidence in the value of the good assets (by no longer mixing with bad assets), the effectiveness of this resolution procedure faces the same limitations as the procedures discussed above. During a panic with uncertain loss levels, there is no mechanism to ensure short-term creditors will not run since they are not completely shielded from potential losses. Because of this, the approach is not designed to stop a contagious run. In fact, historical implementations of a good-bank/bad-bank resolution have generally proved to be unsuccessful.

Other resolution approaches include living wills and the use of the Orderly Liquidation Authority under Dodd-Frank. Living wills are ex ante plans outlined by large complex financial institutions for winding down operations in case of insolvency. The purpose is to aid in a swift resolution with minimal disruption to the market, while also encouraging management to simplify organizational structures. While such a plan may reduce the transaction costs incurred by regulators in resolving a failed institution, living wills do nothing to reassure short-term creditors, and thus are unable to deter contagious runs. The Orderly Liquidation Authority (OLA) is another method of resolving failed institutions outside bankruptcy proceedings. Similar to living wills, the goal of the OLA is to resolve a financial institution with minimal costs and minimal disruption to the market. In this way, the OLA system is designed for the purpose of preserving the value of the assets rather than to avoid impairing creditors. Absent any explicit protection of short-term creditors, this procedure will also fail to stem contagion.

In general, ex post resolution procedures are designed to impose losses on debt and equity holders of financial institutions that are being wound down. If a financial institution has failed, by definition, capital and liquidity requirements will no longer be effective. However, resolution procedures that threaten short-term debt holders with loss are likely to provoke contagion. On the other hand, resolution rules that exempt these short-term lenders from impairment will limit the amount of losses that can be imposed on institutions, particularly as the amount of short-term funding expands in light of its protected status.

Money Market Mutual Fund Reform

Given the significant role that money market mutual funds play in providing wholesale short-term funding to the banking system, MMMF reform has been the subject of much recent debate. Chairman of the SEC, Mary Schapiro, has advocated redemption restrictions on MMMF investments, a proposal that has failed to receive majority support from the Commission thus far and has been widely opposed by the MMMF industry. The SEC has also increased the liquidity requirements of MMMFs by reducing the maximum permitted weighted average maturity of portfolios and requiring minimum levels of highly liquid assets. Furthermore, the Investment Company Institute has proposed the creation of a liquidity facility that is privately funded and would provide emergency funding to participating funds. Additional reform proposals include a

requirement that MMMFs float their NAV and a requirement that MMMFs hold a small capital buffer to absorb any losses.

Contagion is the result of a structural dependency of the financial system. The only certain way to combat contagion is to protect short-term creditors through public support. This support comes in the form of lender of last resort or public guarantees as used by various methods during the financial crisis. However, while these policies can stem contagion they also raise concerns about moral hazard and public expense.

Lender of Last Resort

During the financial crisis, the Federal Reserve expanded its liquidity provision beyond the discount window through the creation of a sweeping series of novel borrowing facilities. Dodd-Frank, however, radically cuts back the scope of the Federal Reserve's authority to lend and strengthens collateral requirements for any emergency lending it does provide. It prohibits assistance to individual institutions and requires that all emergency lending be subject to prior approval of the Secretary of the Treasury and be governed by policies agreed to by Treasury that ensure that the loans are adequately collateralized and never extended to insolvent borrowers. Holders of short-term debt are unlikely to accept the uncertainty inherent in an ad hoc lending regime that might be cancelled at any time (or never initiated), especially when the arbiter of the decision is the Secretary of the Treasury.

The Federal Reserve profited from its lending during the financial crisis and did not incur losses, so taxpayers were actually better off as the Fed remitted higher profits to the Treasury. However, this might not always be the case. To protect taxpayers (whose taxes would have to make up any shortfall of Treasury revenues from Federal Reserve losses), a method for recouping public loss would need to be devised. Assessments could be imposed ex ante or ex post, and the design of such a system would be a complex undertaking.

Guarantees and Insurance

Deposit insurance is regarded as a critical stabilizing feature of financial regulation, but innovation in financial technology over the past three decades and increasing intermediation in the modern financial system through non-deposit short-term funding have now rendered the

coverage it provides for short-term creditors highly incomplete. At the beginning of the financial crisis, short-term creditors of financial institutions assumed the existence of an implicit government guarantee of all uninsured short-term liabilities. However, in allowing Lehman to fail, the government sent a signal of cancelling or at least weakening this guarantee. In this way, it was the loss of a public guarantee that triggered the spread of contagion effects in markets for short-term institutional borrowing.

In response to the resulting crisis, the Treasury and the FDIC guaranteed a wide range of liabilities through unlimited deposit insurance and guarantees of money market fund deposits and senior debt. Such policies greatly helped to stem contagion. Based on this experience, what may be necessary is a more complete public guarantee of short-term financial liabilities, whether held by banks or non-bank financial institutions. A system of universal insurance for short-term financial liabilities could assure short-term creditors automatic protection, funded by assessments on issuers. The cost of supplying a public guarantee could be internalized by issuers through ex ante risk-based insurance premiums or another form of ex post assessments. As with any insurance system, the concern of moral hazard arises, as insured creditors no longer have incentive to provide market discipline on the financial institution. Tying premiums or assessments to various risk measures could in theory serve to mitigate ex ante moral hazard concerns, but whether they could in practice is another matter.

At the time of the financial crisis the policies mentioned above were adopted ad hoc and charged for when provided. Under Dodd-Frank, the power to furnish such guarantees does not exist ex ante and could only be used during a crisis pursuant to a joint resolution of Congress. Further, the ability of the Treasury to guarantee the money market funds was restricted by the earlier TARP legislation.

Thus, the ability of the United States to effectively stem contagion through lender of last resort or insurance/guarantees has been greatly weakened by Dodd-Frank.

Public Capital Injections (i.e., "Bailouts")

The use of taxpayer funds to save ailing financial institutions during the financial crisis through the Capital Purchase Program (CPP) of TARP was highly controversial. Bailouts

involve the up-front use of taxpayers' money and often result from an ad hoc rescue plan put into place after a crisis has erupted. As a result, politics play a prominent role. In the United States, the executive branch does not have general authority to inject capital, and thus congressional politics may introduce significant uncertainty, as we saw in the adoption of TARP itself.

Capital injections, like other techniques used in the crisis, can quell fears of short-term creditors. They may also be necessary to preserve important financial institutions whose failure would greatly damage the economy. Nonetheless, their use raises many concerns. Beyond moral hazard and public expense is the fear that bailouts may be politically motivated (for example, the bailouts of the auto companies or small banks) rather than used to avoid a systemic meltdown. There is also a concern that bailouts will not work and may evolve into multiple efforts to prop up insolvent banks for an extended period of time without any real hope of recovery. Furthermore, a criticism of TARP was that CPP participants received overly favorable terms. In addition, there was a concern with government interference with firm operations.

Public support and bailouts may be a politically unpopular tool for addressing systemic risk during a financial crisis, but may be the lesser of two evils if economic collapse is the alternative. If guarantee or insurance regimes for short-term creditors are not in place to quell potential contagions, the likelihood that the government will have to step in to provide capital may increase. While it is difficult to lay out an ex ante bailout policy given the unknown variables that accompany crises, there may be several prudent principles to follow. First, for a country like the United States where standing authority to inject capital into banks might not be politically feasible, Congress nevertheless should act swiftly on rescue efforts. Second, a comprehensive, proactive plan should be announced and adopted at the onset of the crisis to eliminate uncertainties in the market. Third, the government should be willing to hold current management and equity holders accountable. Fourth, bailout investments should be conducted in a commercial manner to the extent possible. Finally, the government should ensure transparency in its operations.

As discussed above, for regulation to address contagion effectively, ideally it must internalize the systemic costs of financial intermediation, and, with respect to government guarantees or bailout, it must aim to avoid moral hazard by firms that are so supported. At the

same time, regulation should not amplify the risk of further contagion. We hope this paper will stimulate a vigorous debate on how best to achieve these conflicting objectives.

INTRODUCTION

In the aftermath of the global financial crisis that began in 2007, systemic risk has emerged as the most important and challenging aspect of financial regulation and policy.¹ As defined by one analyst,² systemic risk is the “risk of disruption to financial services that is caused by an impairment of all or parts of the financial system and has the potential to have serious negative consequences for the real economy.”³

Central to systemic risk are what Scott has called the “three Cs”: connectedness (“interconnectedness” hereafter), contagion, and correlation.⁴ Interconnectedness can relate to assets or liabilities, and generally refers to the phenomenon in which the failure of, or large losses borne by, one firm precipitates the failure of, or large losses borne by, a second firm because the second has an exposure to the first failed institution that exceeds its capital.⁵ These exposures may be through direct credit relationships, which we refer to herein as “asset interconnectedness,” where one firm with credit risk to another fails, and sets off a chain reaction of further failures, i.e., the failure of a third firm with credit exposure to the second firm. Or connectedness may be a funding problem, where the failure of a firm providing funding to others, e.g., clearing banks, deprives many other financial institutions of funding, which we refer to as “liability interconnectedness.” Contagion denotes the process whereby the failure of one institution either causes the creditors of others to withdraw funding in a manner akin to a classic bank run or sets off a general panic leading debt markets to freeze. Indeed, contagion may not even start with the failure of any particular firm—for example there could be a run on European

¹ Hal S. Scott, *The Reduction of Systemic Risk in the United States Financial System*, 33 HARV. J.L. & PUB. POL’Y 671, 672-79 (2010) (discussing the centrality of the problem of systemic risk to modern financial systems regulation).

² See, e.g., Jaime Caruana, *Systemic Risk: How to Deal with It?*, BANK FOR INT’L SETTLEMENTS, Feb. 12, 2010, <http://www.bis.org/publ/othp08.htm#P01> (noting that “[t]he international financial crisis has made us all think much harder...about what systemic risk means”).

³ *Id.*

⁴ See Hal S. Scott, *How to Improve Five Important Areas of Financial Regulation*, in RULES FOR GROWTH: PROMOTING INNOVATION AND GROWTH THROUGH LEGAL REFORM 113, 114 (2011).

⁵ See *id.* at 114.

banks because funders fear that all such banks could be in trouble. This problem can be amplified by liquidity connectedness—the failure of important banks can shrink liquidity and thus intensify the contagion problem. Correlation describes the severe losses or failure of multiple institutions due to correlations of asset prices that collapse on account of an exogenous event.⁶ Interconnectedness, contagion, and correlation are all interrelated. Either correlation or asset or liability interconnectedness could precipitate contagion.

The effects of both interconnectedness and contagion manifested themselves after the collapse of Lehman Brothers (Lehman)⁷ in September 2008. Part I.A focuses on asset interconnectedness through the lens of the Lehman collapse. It first gives a brief summary of the collapse and resulting bankruptcy and then investigates the effects on creditors as a whole before turning in detail to Lehman’s derivatives counterparties, prime brokerage clients, structured securities investors, and money market funds. Part I.B introduces liability interconnectedness, which did not appear to be an issue spurred by Lehman’s failure as Lehman was not a major source of funding within the financial system, and no major bank failed during the financial crisis. Part I.C follows with a discussion of policy initiatives aimed to address the systemic risk posed by interconnectedness, including Dodd-Frank requirements for central clearing, exposure limitations, and minimization of concentration.

Part II focuses on contagion. Contagion is the spread of run behavior. During the financial crisis, this occurred principally among short-term creditors of financial institutions, financial intermediaries, and other financial market participants, like commercial paper issuers. The financial system is uniquely vulnerable to contagion because it depends pervasively on short-term borrowing to finance long-term investment. Financial institutions obtain short-term borrowing from traditional depository sources and increasingly through the short-term capital or money markets. Unless its effects are contained, the impact of contagion within the financial system on the non-financial sector of the economy can be socially costly because solvent financial institutions (and markets for short-term borrowing upon which they depend) can fail or

⁶ Correlation is a macro-economic issue that can be addressed through economic policy. The complexities of developing such a policy lie outside the scope of this paper and are not discussed here.

⁷ This paper uses “Lehman” to refer to all Lehman Brothers entities. When distinctions among entities are necessary, it employs the relevant company’s legal name.

freeze, curtailing lending activity and isolating businesses from access to capital. Regulation that is effective against financial contagion must overcome the central dilemma of all systemic risk regulation: how to (1) internalize the systemic costs of financial intermediation that are created by contagion to the financial system, and to reduce potential moral hazard, without (2) amplifying the systemic risk of contagion in the process of doing so. The central contention of this study is that although many of the strategies devised to deal with systemic risks to the financial system (including capital requirements, liquidity requirements, and various resolution procedures) competently tackle the first prong of this dilemma through the imposition of losses on shareholders and creditors of financial institutions, few strategies directly address both.

Part II.A distinguishes the problem of contagion from other forms of systemic risk to the financial system, identifies its causes, and orients it within U.S. financial history. It concludes that contagion is often a direct consequence of the structural dependency on short-term borrowing incurred by bank and non-bank financial institutions to profitably fund long-term investment. It then scrutinizes the extension of risks to non-bank financial intermediaries and short-term capital markets following the growth of these sectors over the past thirty years. It presents evidence of significant contagion effects throughout segments of the non-depository financial system after the failure of Lehman in late 2008. The conclusion of Part II.A.3 is that contagion in this context is the result of the extension of the structural dependency on short-term borrowing beyond traditional depository banking. In areas of the short-term capital or money markets that supply the non-financial economy with a direct source of short-term financing, such as the corporate commercial paper market, these effects can be particularly problematic as they migrate directly over to industrial companies.

Part II.B presents several proposals to address systemic risk. Subpart 1 considers a diverse set of strategies for regulatory reform, the most important of these being (a) enhanced institutional capital requirements, (b) new private liquidity requirements, and (c) loss-imposing resolution procedures. The basic critique developed in this part is that all three of these strategies prioritize imposing losses on private actors in the financial system (the first prong of the dilemma of systemic risk regulation) but neglect to resolve the systemic dependency of financial institutions and intermediaries on short-term borrowing, so none is a comprehensive solution. Subpart 2 considers the principal guarantee strategies, including (a) unlimited public liquidity

support for, or (b) an explicit guarantee of, short-term non-deposit liabilities issued by financial institutions, including money market funds, deployed either in the form of a central bank lender of last resort or as a publicly administered insurance regime modeled on deposit insurance. Finally, in subpart 3 we discuss financial bailouts (other than through the central bank), and provide a historical perspective and international comparisons as well as critiques of this approach.

This study is part of a broader review of issues in financial regulatory reform conducted by the Committee on Capital Markets Regulation (CCMR) in the wake of the financial crisis. The first stage of this review resulted in a report released in May 2009 by the CCMR.⁸ The CCMR is an independent, nonpartisan research organization founded in 2005 to improve the regulation of U.S. capital markets. CCMR is comprised of thirty-two leaders from the investment, business, finance, law, accounting, and academic communities. Glenn Hubbard, Dean of Columbia Business School, and John L. Thornton, Chairman of the Brookings Institution, are its co-chairs.⁹ Its director is Hal S. Scott, Nomura Professor and Director of the Program on International Financial Systems at Harvard Law School.

I. Interconnectedness

A. Asset Interconnectedness

1. Lehman Brothers' Collapse and Bankruptcy

While it may have taken more than 150 years to build up the Lehman franchise from its humble beginnings as an Alabama general store,¹⁰ it took only a matter of weeks to tear it down. Lehman Brothers Holdings Inc. (LBHI) filed for bankruptcy protection on September 15, 2008,¹¹ setting into motion the largest corporate failure in U.S. history.¹² This failure came about despite

⁸ See COMM. ON CAPITAL MKTS. REGULATION, *THE GLOBAL FINANCIAL CRISIS: A PLAN FOR REGULATORY REFORM* (2009) [hereinafter CCMR PLAN FOR REGULATORY REFORM].

⁹ *Id.*

¹⁰ See Deal Journal, *From General Store to Titan: A Brief History of Lehman*, WALL ST. J., Sept. 15, 2008, <http://blogs.wsj.com/deals/2008/09/15/from-general-store-to-titan-a-brief-history-of-lehman/>.

¹¹ Voluntary Petition, *In re Lehman Bros. Holdings Inc.*, No. 08-13555 (Bankr. S.D.N.Y. Sept. 15, 2008).

¹² Sam Mamudi, *Lehman Folds with Record \$613 Billion Debt*, MARKETWATCH, Sept. 15, 2008, <http://www.marketwatch.com/story/lehman-folds-with-record-613-billion-debt?siteid=rss>.

the firm's last reported solvency (though, as discussed below, the market thought otherwise and may have been justified in its belief).¹³ On a consolidated basis, Lehman had reported \$639 billion of assets and \$613 billion of liabilities in its last audited financial report, dated May 31, 2008.¹⁴ Further, the Lehman estate's unaudited balance sheets for LBHI and its affiliates indicated that, as of the day before LBHI's filing, the entire firm had \$626 billion of assets and just \$560 billion of liabilities, with LBHI holding \$209 billion of assets and only \$189 billion of liabilities.¹⁵

Nonetheless, LBHI and its affiliates¹⁶ seem to have had little choice but to file for Chapter 11. In the days leading up to LBHI's filing, Lehman faced a severe liquidity crisis, an occurrence that regulators and market participants increasingly feared would befall Lehman following the near failure of Bear Stearns in March.¹⁷ Lehman's court-appointed bankruptcy examiner, Anton Valukas (the Examiner), explained the rationale behind this fear, noting that "[f]inancial institutions such as Lehman ha[d] a relatively greater risk of failure due to a lack of liquidity, as compared to a risk of failure due to the value of their liabilities exceeding the fair value of their assets."¹⁸ But Lehman management downplayed its liquidity risk in the aftermath of Bear Stearns's near collapse and "told the rating agencies that it was focused on building its 'liquidity fortress.'"¹⁹

In the end, though, Lehman's fortress was breached. Describing the firm's final days, Lehman's CFO reported that "cash and collateral were being tied up by [its] clearing banks...[and] cash had drained very quickly over the last three days of the previous week

¹³ See 2 Examiner's Report, *infra* note 22, at 214-15 (noting that there was enough evidence to suggest the firm had overvalued some of its Principal Transaction Group real estate assets and its Archstone bridge equity investment).

¹⁴ Voluntary Petition at Exhibit A, *In re* Lehman Bros. Holdings Inc., No. 08-13555 (Bankr. S.D.N.Y. Sept. 15, 2008).

¹⁵ Debtors' Disclosure Statement for Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors Pursuant to Section 1125 of the Bankruptcy Code at Exhibit 2A, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Apr. 14, 2010) [hereinafter Disclosure Statement for Initial Plan].

¹⁶ Twenty-four LBHI affiliates subsequently filed for Chapter 11 in the United States. Two of these cases were dismissed, and the rest are being jointly administered with LBHI's. See *Case Information*, (LBH) CLIENT HOME, <http://chapter11.epiqsystems.com/LBH/Project/default.aspx> (last visited Feb. 9, 2012); *General Information*, (LBH) CLIENT HOME, <http://chapter11.epiqsystems.com/LBH/Project/default.aspx> (last visited Feb. 9, 2012).

¹⁷ See 2 Report of Anton R. Valukas, Examiner 631, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Mar. 11, 2010) [hereinafter Examiner's Report].

¹⁸ 5 *id.* at 1643.

¹⁹ 2 *id.* at 634.

[preceding its filing].”²⁰ Lehman found itself in this position ultimately because the market believed that despite the firm’s last reported solvency, the current value of its liabilities in fact exceeded the value of its assets or would soon do so following further losses. While former Lehman CEO Richard Fuld has argued that the market’s fears over Lehman’s solvency were unwarranted,²¹ the Examiner uncovered evidence to suggest otherwise as it concluded that at least some of Lehman’s assets may have been unreasonably valued.²²

But whether one believes that the market unfairly penalized Lehman or accurately assessed its problems, it is beyond debate that Lehman made significant missteps in the years leading up to its bankruptcy. Chief among them was an aggressive growth strategy that, beginning in 2006, led it to commit an increasing amount of capital to commercial real estate, leveraged loans, and illiquid private equity investments.²³ This plan proved particularly risky owing to the firm’s high leverage and small equity cushion,²⁴ which meant that small percentage declines in asset values could lead to insolvency. To be sure, Lehman was not alone in embracing leverage; rather, “excessive leverage was a pervasive problem” among financial institutions, according to former Federal Deposit Insurance Corporation (FDIC) Chairman Sheila Bair.²⁵ Indeed, in concluding that “[i]n the years leading up to the crisis, too many financial institutions... borrowed to the hilt,” the Financial Crisis Inquiry Commission (FCIC) emphasized that “as of 2007, the five major investment banks [which included Lehman] were operating with extraordinarily thin capital,” leading to leverage ratios as high as 40 to 1.²⁶

²⁰ 4 *id.* at 1464.

²¹ See, e.g., *Hearing Before the Financial Crisis Inquiry Commission* (Sept. 1, 2010) (statement of Richard S. Fuld, Jr.), http://fcic-static.law.stanford.edu/cdn_media/fcic-testimony/2010-0901-Fuld.pdf (lamenting that “Lehman’s demise was caused by uncontrollable market forces and the incorrect market perception and accompanying rumors that Lehman did not have sufficient capital to support its investments”).

²² See 2 Examiner’s Report, *supra* note 17, at 214-15 (noting that there was enough evidence to suggest the firm had overvalued some of its Principal Transaction Group real estate assets and its Archstone bridge equity investment).

²³ See 1 *id.* at 43.

²⁴ See 1 *id.* at 62.

²⁵ Sheila Bair, *Road to Safer Banks Runs Through Basel*, FIN. TIMES, Aug. 23, 2010, <http://www.ft.com/cms/s/0/a1dfbd02-ae8-11df-8e45-00144feabdc0.html#axzz1uqOCR300>; see Thomas A. Russo & Aaron J. Katzel, *The 2008 Financial Crisis and Its Aftermath: Addressing the Next Debt Challenge* 12 (Group of Thirty, Occasional Paper No. 82, 2011) (arguing that the 2008 financial crisis was fundamentally “caused by excessive leverage at each level of the economy”).

²⁶ FINANCIAL CRISIS INQUIRY COMMISSION (FCIC), THE FINANCIAL CRISIS INQUIRY REPORT, at xix (2011) [hereinafter FCIC REPORT].

While Lehman was therefore not the only highly leveraged investment bank preceding the financial crisis, some of its decisions were uniquely problematic. In particular, when the market for the assets that it had targeted for increased investment began to show signs of weakness in 2007 amid the incipient subprime crisis, Lehman's management decided to "double-down" so as to take advantage of "substantial opportunities."²⁷ More specifically, the Examiner found that as its competitors were reducing their risk, Lehman saw an "opportunity to pick up ground and improve its competitive position."²⁸ Seizing this opportunity, which nearly doubled the reported value of Lehman's commercial real estate assets from \$28.9 billion at the end of 2006 to \$55.2 billion at the end of 2007,²⁹ proved costly. Not only did the firm's commercial real estate portfolio account for a large portion of the company's reported losses,³⁰ but, as discussed further below, it also fueled concerns among possible suitors over future write-downs.

Saddled with a balance sheet of souring assets, Lehman explored a number of options to help at least part of the firm survive. First, by the summer of 2008 (and after initially dismissing the idea in March 2008), management began seriously contemplating a spin-off of the firm's problematic commercial real estate exposure into an entity labeled SpinCo.³¹ The SpinCo strategy was designed to (1) relieve Lehman's balance sheet of the firm's increasingly worrisome commercial real estate assets, (2) reduce the need to continue marking down these assets as the market deteriorated (pursuant to an agreement with the SEC allowing SpinCo to account for its loan assets on a "hold to maturity" instead of mark-to-market basis), (3) avoid fire sales that would exacerbate and crystallize paper losses on the assets, and (4) improve the financial strength of the rest of the firm.³² But to achieve these goals, Lehman would need to ensure that SpinCo was a viable standalone entity and thus, would need to infuse it with equity equivalent to at least 20% to 25% of the value of the transferred assets.³³ By September 2008, Lehman hoped to obtain this equity (estimated by management to be \$7.9 billion based on a spin-off of \$31.6 billion in assets and a loan-to-value ratio of 75%) by selling 51% of its investment management

²⁷ 1 Examiner's Report, *supra* note 17, at 4 & n.13 (quoting former Lehman director Dr. Henry Kaufman).

²⁸ *Id.* at 45.

²⁹ 2 *id.* at 224.

³⁰ *See* 1 *id.* at 45.

³¹ 2 *id.* at 616, 642-43.

³² *Id.* at 640-42, 657.

³³ *Id.* at 645.

division for \$2.5 billion, issuing \$3 billion of equity directly, and raising over \$2 billion from a third-party investor.³⁴ Yet Lehman was unable to carry out this plan quickly enough to avoid bankruptcy, and it is far from clear that it would have been able to effectuate the spin-off even if it did have significantly more time. Indeed, time constraints aside, Treasury Secretary Paulson, JPMorgan CEO Jamie Dimon, and Warren Buffett, among others, were highly skeptical of the spin-off.³⁵

In addition to a spin-off of its most troublesome assets, Lehman explored the possibility of entering into a strategic partnership and, as its situation grew more dire, selling itself to a competitor. As to potential strategic partners, Lehman reached out to, among others, (1) Warren Buffett, who demanded better terms than Lehman was willing to offer in March 2008 and dismissed Lehman's SpinCo proposal around September 2008;³⁶ (2) Korea Development Bank, which had expressed interest in a \$6 billion investment in "Clean Lehman" (that is, Lehman without SpinCo) as late as August 31, 2008 but failed to reach an agreement with Lehman owing to significant differences in valuation and rapidly deteriorating market conditions;³⁷ and (3) MetLife, which passed on an investment on August 20, 2008 because it already had substantial commercial real estate exposure and thus did not want any of Lehman's.³⁸

As to a buyer, Lehman's most promising prospects were Bank of America and Barclays. Lehman had two rounds of discussions with Bank of America. First, in July 2008, it proposed a merger between its investment bank and Bank of America's that would result in Lehman owning about two-thirds of the combined entity, but Bank of America rejected the proposal because it did not make financial sense for the bank and because it would not give Bank of America control over the merged company.³⁹ Then, around early September 2008, fearing "that Lehman could become a serious problem," Treasury Secretary Paulson began pressuring Bank of America to buy Lehman.⁴⁰ Yet Bank of America ultimately refused as CEO Ken Lewis believed that the bank would gain little strategic benefit from a deal with Lehman. Bank of America's due

³⁴ *Id.* at 647-48.

³⁵ *See id.* at 642.

³⁶ *See id.* at 667-68.

³⁷ *See id.* at 678-81.

³⁸ *See id.* at 690-91.

³⁹ *See id.* at 693-95.

⁴⁰ *Id.* at 697.

diligence team concluded that Lehman's commercial real estate positions were overvalued, it "had uncovered approximately \$65-\$67 billion worth of Lehman assets that...it did not want at any price," and, in light of these unwanted assets, the bank was unwilling to pursue a deal without government assistance, which was not forthcoming.⁴¹

Barclays expressed greater interest and indeed, would ultimately purchase Lehman's U.S. and Canadian investment banking and capital markets businesses in bankruptcy.⁴² Barclays was unable to consummate a deal before bankruptcy because its U.K. regulator, the Financial Services Authority (FSA), refused to waive the requirement that a guaranty by Barclays of Lehman's obligations prior to the closing of the transaction (as demanded by the Federal Reserve Bank of New York) garner the approval of Barclays shareholders.⁴³ Had the FSA waived this requirement, Barclays would have purchased Lehman's operating subsidiaries for about \$3 billion and would have guaranteed Lehman's debt.⁴⁴ Notably, however, Barclays would not have assumed any of the commercial real estate assets that Lehman planned to put in SpinCo.⁴⁵ Thus, even if the envisioned transaction had been consummated, what remained of Lehman would have still needed to find a way to manage highly problematic commercial real estate exposure, though it might have avoided a bankruptcy filing.

However, without a transaction for any of its subsidiaries, LBHI was left with no choice but to file for bankruptcy. Because LBHI was so critical to Lehman's operations and functioned as "the central banker for the Lehman entities,"⁴⁶ its filing caused key subsidiaries to similarly seek protection. Though some of these subsidiaries appeared solvent prior to LBHI's collapse, they lacked the liquidity to function without LBHI's ongoing support (suggesting that the issue of liability connectedness arises within firms as well as between them). Perhaps most notably in this regard, the same day that LBHI filed under Chapter 11, its European broker-dealer

⁴¹ *Id.* at 699-700.

⁴² *See* Order Under 11 U.S.C. §§ 105(a), 363, and 365 and Federal Rules of Bankruptcy Procedure 2002, 6004 and 6006 Authorizing and Approving (A) the Sale of Purchased Assets Free and Clear of Liens and Other Interests and (B) Assumption and Assignment of Executory Contracts and Unexpired Leases, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Sept. 20, 2008).

⁴³ *See* 2 Examiner's Report, *supra* note 17, at 706-07, 709.

⁴⁴ *Id.* at 707.

⁴⁵ *See id.* at 706.

⁴⁶ 5 *id.* at 1550.

subsidiary, Lehman Brothers International (Europe) (LBIE), was placed into administration.⁴⁷ While LBIE's balance sheet then implied that it had nearly \$17 billion in equity (\$49.5 billion in net assets against only \$32.6 billion in net liabilities), it was forced to seek administrative protection because "LBHI managed substantially all of the material cash resources of the Lehman Group centrally" and "LBIE was informed by LBHI that it would no longer be in a position to make payments to or for LBIE."⁴⁸ Four days later, LBHI's U.S. broker-dealer, Lehman Brothers Inc. (LBI), was placed into a liquidation proceeding under the Securities Investor Protection Act of 1970 (SIPA),⁴⁹ in connection with which its U.S. and Canadian investment banking and capital markets businesses were sold to Barclays.⁵⁰ Despite reporting more than \$3 billion in excess capital at the end of August 2008 and generally being in compliance with regulatory requirements, LBI was forced to wind down because "it was a foregone conclusion that [it could] not survive as an independent entity."⁵¹ For a similar reason, by the beginning of October, fifteen LBHI subsidiaries filed for Chapter 11 in the United States, and in the end, more than twenty would do so.⁵² However, unlike LBI and LBIE—which, as broker-dealers, were subject to stricter regulation—some of LBHI's Chapter 11 affiliates were at most "borderline" solvent prior to LBHI's filing and thus required significant capital infusions from LBHI in 2008.⁵³

The profusion of Lehman filings sparked a number of controversies both within the United States and across borders. Cross-border friction stemmed primarily from disagreements

⁴⁷ See PricewaterhouseCoopers, *Lehman Brothers International (Europe) (in Administration): Joint Administrators' Progress Report for the Period 15 September 2008 to 14 March 2009*, at 9, Apr. 14, 2009.

⁴⁸ *Id.* at 4-5, 8.

⁴⁹ Order Commencing Liquidation, *In re Lehman Bros. Inc.*, No. 08-01420 (SIPA) (S.D.N.Y. Sept. 19, 2008).

⁵⁰ See Order Under 11 U.S.C. §§ 105(a), 363, and 365 and Federal Rules of Bankruptcy Procedure 2002, 6004 and 6006 Authorizing and Approving (A) the Sale of Purchased Assets Free and Clear of Liens and Other Interests and (B) Assumption and Assignment of Executory Contracts and Unexpired Leases, *In re Lehman Bros. Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Sept. 20, 2008). In the transaction, Barclays also purchased, *inter alia*, Lehman's global headquarters and two data centers. See Asset Purchase Agreement Among Lehman Brothers Holdings Inc., Lehman Brothers Inc., LB 745 LLC and Barclays Capital Inc. § 1.1, at 2, 6-8, Schedule 2 (Sept. 16, 2008).

⁵¹ Trustee's Preliminary Investigation Report and Recommendations at 2-3, Exhibit C-6, *In re Lehman Bros. Inc.*, No. 08-01420 (SIPA) (S.D.N.Y. Sept. 19, 2008).

⁵² See *supra* note 16.

⁵³ See 5 Examiner's Report, *supra* note 17, at 1607 (capital infusions), 1615 (concluding that Lehman Commercial Paper Inc. was "borderline" solvent by late 2007 and insolvent by February 2008), 1621 (finding that Lehman Brothers Special Financing Inc. was "borderline" solvent from September 2007 to August 2008), 1626 (finding that Lehman Brothers Commercial Corporation was "borderline" solvent from September 2007 to August 2008).

between LBHI and LBIE that, while illustrative of critical shortcomings of the current international insolvency regime, are generally not germane to this report.⁵⁴ More significant to this report, Lehman's Chapter 11 filings provoked a heated dispute that explains why it took nearly three years for a plan to even come to a creditor vote.⁵⁵ Indeed, until the estate filed its second amended plan on June 30, 2011,⁵⁶ three separate liquidation frameworks were vying for confirmation as parties sparred over the degree to which LBHI's affiliated U.S. debtors should be "substantively consolidated" with LBHI. An equitable remedy that recognizes debtors as one combined entity, substantive consolidation "pools all assets and liabilities of... subsidiaries into their parent and treats all claims against the subsidiaries as transferred to the parent."⁵⁷ In doing so, the remedy also "eliminates the intercorporate liabilities of the consolidated entities."⁵⁸ Because of the vast array of intercompany claims and guarantees filed in the Lehman case,⁵⁹ the potential elimination of intercorporate liabilities primarily drove the substantive consolidation dispute. In particular, under a plan that recognized the corporate separateness of LBHI's subsidiaries, creditors with claims against an LBHI subsidiary subject to an LBHI guarantee could pursue recoveries against both the subsidiary and LBHI, but under a substantively consolidated plan, these creditors' guarantee claims would be eliminated and their recoveries

⁵⁴ Though this paper does discuss losses arising from certain non-U.S. Lehman entities, it does not focus on insolvency proceedings outside of the United States. *See infra* note 93. It is worth briefly noting, however, that cross-border controversy has erupted between certain entities, principally LBHI and U.K.-based LBIE. To be sure, in May 2009, the LBHI estate and administrators of four non-U.S. proceedings adopted a private cross-border insolvency protocol "to facilitate the coordination of the Proceedings." Cross-Border Insolvency Protocol for the Lehman Brothers Group of Companies 2 (May 12, 2009), <http://www.globalturnaround.com/cases/Lehman%20Protocol.pdf>. While administrators from four additional nations and the LBI SIPA trustee have since signed on, LBHI's most significant non-U.S. affiliated debtor, LBIE, has not. *See* Debtors' Disclosure Statement for First Amended Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors Pursuant to Section 1125 of the Bankruptcy Code at 49-50, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Jan. 25, 2011) [hereinafter Disclosure Statement for First Amended Plan]. No less significant than LBIE's absence from the protocol is the agreement's largely aspirational nature. *See Developments in the Law—Extraterritoriality*, 124 HARV. L. REV. 1226, 1301-03 (2011) (discussing the problems with the Lehman cross-border protocol.). As a result, the LBHI estate has had to engage in bilateral settlement negotiations with not only entities that have not signed the protocol (namely, LBIE) but also entities that have signed it. *See* Disclosure Statement for First Amended Plan, *supra*, at 50-51.

⁵⁵ *See* Joseph Checkler, *Lehman Creditor Plan Heads for Vote*, WALL ST. J., Aug. 31, 2011, <http://online.wsj.com/article/SB10001424053111904332804576540641768081466.html>.

⁵⁶ Second Amended Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and its Affiliated Debtors, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. June 30, 2011).

⁵⁷ *In re* Owens Corning, 419 F.3d 195, 202 (3d Cir. 2005).

⁵⁸ *Eastgroup Props. v. S. Motel Ass'n, Ltd.*, 935 F.2d 245, 248 (11th Cir. 1991).

⁵⁹ *See infra* Part I.B.1.a.

would accordingly fall (and the recoveries of creditors with claims against only LBHI would rise).

The estate initially offered a plan in April 2010 (the Initial Plan)⁶⁰ that rejected substantive consolidation and instead “recognize[d] the corporate integrity of each Debtor.”⁶¹ A group of creditors primarily holding senior unsecured claims against LBHI (the Ad Hoc Group) countered in December 2010 with a plan premised on substantive consolidation (the Initial Ad Hoc Plan).⁶² In light of the “risk of substantive consolidation” illustrated by the Initial Ad Hoc Plan, the estate responded with a plan in January 2011 (the First Amended Plan)⁶³ that continued to “recognize[] the corporate integrity of each Debtor” but “provide[d] for compromises [to LBHI-only creditors] that would eliminate the necessity of litigating...[issues] relating to substantive consolidation.”⁶⁴ However, in the view of a group of creditors holding claims against LBHI and certain of its affiliated debtors (the Non-Consolidation Group), the First Amended Plan’s compromise consideration to LBHI-only creditors was “unprincipled” and had “no reasonable basis.”⁶⁵ Thus, in April 2011, the Non-Consolidation Group proposed a plan (the Non-Consolidation Plan)⁶⁶ that, like the First Amended Plan, did not substantively consolidate LBHI and its affiliated debtors but, unlike the First Amended Plan, did not offer LBHI-only

⁶⁰ The plan was originally filed on March 15, 2010. Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Mar. 15, 2010). It was slightly revised and re-filed on April 14 in conjunction with a disclosure statement. Notice of Filing of Revised Chapter 11 Plan, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Apr. 14, 2010); Disclosure Statement for Initial Plan, *supra* note 15.

⁶¹ Disclosure Statement for First Amended Plan, *supra* note 54, at 3.

⁶² Joint Substantively Consolidating Chapter 11 Plan for Lehman Brothers Holdings Inc. and Certain of Its Affiliated Debtors Other Than Merit, LLC, LB Somerset LLC and LB Preferred Somerset LLC Proposed by the Ad Hoc Group of Lehman Brothers Creditors, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Dec. 15, 2010); Disclosure Statement for the Joint Substantively Consolidating Chapter 11 Plan for Lehman Brothers Holdings Inc. and Certain of Its Affiliated Debtors Other Than Merit, LLC, LB Somerset LLC and LB Preferred Somerset LLC Proposed by the Ad Hoc Group of Lehman Brothers Creditors, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Dec. 15, 2010) [hereinafter Disclosure Statement for Initial Ad Hoc Plan].

⁶³ First Amended Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Jan. 25, 2011).

⁶⁴ Disclosure Statement for First Amended Plan, *supra* note 54, at 83.

⁶⁵ Disclosure Statement for the Joint Chapter 11 Plan for Lehman Brothers Holdings Inc. and Its Affiliated Debtors Other Than Merit, LLC, LB Somerset LLC and LB Preferred LLC Proposed by Non-Consolidation Plan Proponents at 1, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Apr. 25, 2011) [hereinafter Disclosure Statement for Non-Consolidation Plan].

⁶⁶ Joint Chapter 11 Plan for Lehman Brothers Holdings Inc. and Its Affiliated Debtors Other Than Merit, LLC, LB Somerset LLC and LB Preferred LLC Proposed by Non-Consolidation Plan Proponents, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Apr. 25, 2011).

creditors any carrots.⁶⁷ Two days later, the Ad Hoc Group filed its own amended plan (the Amended Ad Hoc Plan)⁶⁸ that continued to call for substantive consolidation amid updated assumptions about allowed claims and recoveries.⁶⁹

In June 2011, the estate moved to bridge the gap between the Non-Consolidation Group and the Ad Hoc Group with another amended plan (the Second Amended Plan) that called for a reallocation of distributions based on at least a 20% probability of substantive consolidation.⁷⁰ Thus, while not advocating substantive consolidation, the Second Amended Plan aimed to win the support of creditors that would benefit from substantive consolidation by providing them with varying portions of distributions that would otherwise flow to holders of either third-party guarantee claims against LBHI or claims against LBHI Chapter 11 affiliates.⁷¹ In light of this compromise, the Second Amended Plan won the support of key members of both the Ad Hoc Group and the Non-Consolidation Group.⁷² Moreover, a revised version proffered by the estate on August 31, 2011 (the Third Amended Plan)⁷³—which retained the Second Amended Plan’s substantive consolidation compromise and its class recoveries—quelled certain other creditor objections.⁷⁴ The Third Amended Plan as subsequently modified (the Modified Third Amended

⁶⁷ Disclosure Statement for Non-Consolidation Plan, *supra* note 65, at 1.

⁶⁸ Amended Joint Substantively Consolidating Chapter 11 Plan for Lehman Brothers Holdings Inc. and Certain of Its Affiliated Debtors Other Than Merit, LLC, LB Somerset LLC and LB Preferred Somerset LLC, Proposed by the Ad Hoc Group of Lehman Brothers Creditors, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Apr. 27, 2011).

⁶⁹ *See* Disclosure Statement for the Amended Joint Substantively Consolidating Chapter 11 Plan for Lehman Brothers Holdings Inc. and Certain of Its Affiliated Debtors Other Than Merit, LLC, LB Somerset LLC and LB Preferred Somerset LLC, Proposed by the Ad Hoc Group of Lehman Brothers Creditors at 1, 6, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Apr. 27, 2011) [hereinafter Disclosure Statement for Amended Ad Hoc Plan].

⁷⁰ *See* Debtors’ Disclosure Statement for Second Amended Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors Pursuant to Section 1125 of the Bankruptcy Code at 52, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. June 30, 2011).

⁷¹ *See id.* Exhibit 17 (illustrating the proposed reallocations).

⁷² *See id.* Schedule 4 (listing the creditors that, as of the Second Amended Plan’s filing date, had entered into agreements to support the plan).

⁷³ *See* Third Amended Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Aug. 31, 2011); Debtors’ Disclosure Statement for Third Amended Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors Pursuant to Section 1125 of the Bankruptcy Code, *In re* Lehman Bros. Holdings Inc. et al., No. 08-13555 (Bankr. S.D.N.Y. Aug. 31, 2011) [hereinafter Disclosure Statement for Third Amended Plan].

⁷⁴ *See* *Lehman Revises Bankruptcy Plan To Deal with Objections*, REUTERS, Aug. 25, 2011, <http://in.reuters.com/article/2011/08/25/idINIndia-58974620110825>.

Plan)⁷⁵ was finally confirmed on December 6, 2011 following a creditor vote.⁷⁶ And on March 6, 2012, the plan became effective, enabling Lehman to emerge from bankruptcy and begin distributing recoveries to creditors.⁷⁷ However, while distributions commenced on April 17, 2012 with a disbursement of about \$22.5 billion,⁷⁸ final creditor recoveries will not be known for at least several years, as the timing of and realizable value from asset sales remain uncertain.⁷⁹

But, although they can only estimate creditor recoveries, the Modified Third Amended Plan and the plans that preceded it clearly support the core conclusion of Part I of this paper: the direct exposure of counterparties to any Lehman entity that filed in the United States was not destabilizing in the immediate aftermath of Lehman's failure, when, amid financial system fragility, it had the greatest potential to be, and such exposure has not been destabilizing amid the calmer seas since. Driving this conclusion is the estimated magnitude and nature of unsecured third-party exposure to LBHI and its U.S. debtor affiliates—between about \$150 billion and \$250 billion, spread across a variety of parties.⁸⁰ These figures are large, to be sure. Yet such sums would likely have been perceived as manageable in the aftermath of LBHI's filing even if these third-party creditors had assumed that they would recover nothing. This follows because such third-party exposure, particularly from Lehman senior unsecured debt, was distributed among a large number of individuals and institutions, only some of which were systemically important.

⁷⁵ See Modified Third Amended Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors, *In re Lehman Bros. Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Nov. 29, 2011). In this report, the disclosure statement for the Third Amended Plan will be used to explicate elements of the Modified Third Amended Plan.

⁷⁶ Order Confirming Modified Third Amended Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors, *In re Lehman Bros. Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Dec. 6, 2011).

⁷⁷ Notice of Effective Date and Distribution Date in Connection with the Modified Third Amended Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors, *In re Lehman Bros. Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Mar. 6, 2012).

⁷⁸ See Notice Regarding Initial Distributions Pursuant to the Modified Third Amended Joint Chapter 11 Plan of Lehman Brothers Holdings Inc. and Its Affiliated Debtors at Exhibit B, *In re Lehman Bros. Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Apr. 11, 2012).

⁷⁹ See Disclosure Statement for Third Amended Plan, *supra* note 73, Exhibit 4-1 (noting that “actual results may differ from estimated recoveries and could have a material effect on the recovery percentages” because, *inter alia*, “[t]he Debtors may realize cash flows from certain assets in advance of the timing forecast in the Recovery Analysis”); see also *Lehman Emerges from Bankruptcy*, DISTRESSED DEBT INVESTING (Mar. 6, 2012), <http://www.distressed-debt-investing.com/2012/03/lehman-emerges-from-bankruptcy.html> (noting that “its [sic] hard to guess when Lehman can sell off its real estate, private equity, or principal investments” and that “the market believ[es] that the non-cash assets held by Lehman will be worth more tomorrow than they are today”).

⁸⁰ See Disclosure Statement for Third Amended Plan, *supra* note 73, Annex A-2; see also *infra* text accompanying notes 103-106.

Moreover, some creditors believed that they would recover—and in fact, they did recover—a considerable portion of certain claims well before a plan was even proposed. Most notably in this regard, by September 2009, claims against subsidiary Lehman Brothers Special Financing Inc. (LBSF) guaranteed by LBHI were trading at around forty cents on the dollar, a price around which Morgan Stanley sold a \$1.3 billion claim that month.⁸¹ Further, if not likely to receive forty cents on the dollar, most other creditors still had reason to expect non-zero recoveries given that the estate had a non-negligible amount of assets. The extent of these assets is underscored by the Initial Plan, which indicated that as of the end of 2009, on an undiscounted basis LBHI and its U.S. affiliates would yield about \$66 billion to creditors after an orderly liquidation.⁸² With the estate then projecting about \$370 billion in allowable claims,⁸³ such a liquidation would have yielded an average recovery of nearly 18%. And while Lehman bondholders would have received only about an 8% recovery, creditors to certain key subsidiaries would have received over 20% in what would have been the *worst-case* scenario.⁸⁴

These findings undermine the fears of those who had believed that financial institutions like Lehman, owing to their high leverage ratios, low pools of liquidity, and increasing links with one another, were “too interconnected to fail.”⁸⁵ In concluding that asset interconnectedness has posed far smaller problems than feared, Part I.A.2 examines connections to Lehman from two perspectives, starting with a general assessment of third-party creditor exposure and moving on to an analysis of the exposure of particular groups. More specifically, Subpart A focuses on claims as a whole in the U.S. bankruptcy proceedings, analyzing the magnitude and nature of the claims as well as early recovery expectations. The paper then examines four significant groups that had direct exposure to Lehman or Lehman-related instruments. These groups include derivatives counterparties, prime brokerage clients, structured securities investors, and money market funds. To be sure, in certain instances, entities in these categories incurred or can be

⁸¹ Josh Fineman & Christopher Scinta, *Credit Suisse Group Selling \$1 Billion Lehman Claim*, BLOOMBERG, Sept. 24, 2009, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a08KzEnlvIrk>.

⁸² See Disclosure Statement for Initial Plan, *supra* note 15, Exhibit 5.

⁸³ See *id.*

⁸⁴ See *id.* Exhibit 5-1 (projecting an 8.3% recovery for LBHI senior unsecured claims in a liquidation), Exhibit 5-2 (projecting a 23.6% recovery for LCPI general unsecured claims), Exhibit 5-4 (projecting a 19.5% recovery for LBSF general unsecured claims on top of a 7.0% recovery that LBSF claimants could obtain pursuant to guarantees from LBHI).

⁸⁵ See *Interconnectedness, Fragility and the Financial Crisis: Hearing Before the Fin. Crisis Inquiry Comm'n* 4-5 (Feb. 26-27, 2010) (statement of Randall Kroszner).

expected to incur significant losses, but only a handful failed as a result, and those that did were of negligible importance.

This conclusion is consistent with the findings of several earlier empirical studies in which economists including Upper and Worms, Cocco, Gomes and Margins, and Mistrulli considered the case of interbank relationships in Germany, Portugal, and Italy, respectively.⁸⁶ These economists used balance sheet information to estimate bilateral credit relationships for the various banking systems, and tested the stability of the systems by simulating the breakdown of a single bank. In general, they concluded the systems demonstrated high resilience (although in the case of Upper and Worms, it was estimated that the failure of a single bank could lead to the breakdown of up to 15% of the banking system in terms of assets). Helwege and Zhang (2012) also support this conclusion empirically, failing to find a significant correlation between Lehman's bankruptcy and the failure of other interconnected financial institutions, while also rejecting the idea that Lehman's downfall led to a cascade of bankruptcies through asset interconnections.⁸⁷

While *direct* exposure to Lehman did not prove as problematic as feared, Lehman's failure did have significant *indirect* effects. Notably, Lehman's collapse and the subsequent drying up of the short-term funding markets rapidly spread across financial markets and institutions. In Part II, this paper looks at the more important problem of Lehman's contagious effect in the context of the sources, processes, and possible remedies for contagion in general.

2. The Effects of the Collapse

Losses have not been fully tallied, but it can safely be said that the collapse of Lehman was an unequivocally negative event for a variety of parties with direct exposure to the failed institution. Indeed, such parties have fared far worse than those with exposure to other crippled financial concerns, which, unlike Lehman, were either bailed out or purchased by another

⁸⁶ See Christian Upper & Andreas Worms, *Estimating Bilateral Exposures in the German Interbank Market: Is There a Danger of Contagion?*, 48 EUR. ECON. REV. 827 (2004); Joao Cocco et al., *Lending Relationships in the Interbank Market*, 18 J. FIN. INTERMEDIATION 24 (2009); Paolo Mistrulli, *Assessing Financial Contagion in the Interbank Market: Maximum Entropy versus Observed Interbank Lending Patterns* (Bank of Italy, Working Paper No. 641, Sept. 2007).

⁸⁷ Jean Helwege & Gaiyan Zhang, *Financial Firm Bankruptcy and Contagion* (Working Paper, July 31, 2012).

institution. In this regard, the most telling comparison is to Bear Stearns, the firm whose securitization-heavy business model was believed to so resemble Lehman's that investors viewed Lehman as "just a bigger version of Bear Stearns."⁸⁸ But compared to their Lehman counterparts, Bear Stearns investors made out considerably better. With JPMorgan's purchase of the then-fifth largest investment bank, equity holders ultimately received the equivalent of \$10 a share.⁸⁹ If this recovery at the time seemed de minimis given that Bear Stearns had once been trading at over \$170 per share,⁹⁰ the peak-to-trough loss of almost \$18 billion in market capitalization is less than one-third of the nearly \$60 billion peak-to-trough loss that Lehman stockholders would bear six months later.⁹¹ Indeed, there will be no recovery for Lehman equity interests, which include its common stock that had once been valued at almost \$60 billion and its preferred stock with a redemption value of over \$7 billion.⁹² And though they will not be entirely wiped out, Lehman creditors will bear even larger losses than equity holders. While Bear Stearns creditors were made whole by the JPMorgan purchase, third-party creditors to Lehman's U.S. entities will ultimately lose hundreds of billions of dollars.⁹³

As large as these direct losses may appear, they have not proven catastrophic. In the immediate aftermath of Lehman's collapse, when the financial system was most vulnerable, no major financial institution failed as a result of its Lehman exposure. Further, with claims data indicating that third-party exposure was relatively low, institutions likely expected ultimate losses to be manageable during the crucial window directly following Lehman's collapse. Examining creditor claims as a whole and then assessing key groups exposed to Lehman, this

⁸⁸ WILLIAM D. COHAN, *HOUSE OF CARDS* 507 (2009).

⁸⁹ See Landon Thomas Jr. & Eric Dash, *Seeking Fast Deal, JPMorgan Quintuples Bear Stearns Bid*, N.Y. TIMES, Mar. 25, 2008, <http://www.nytimes.com/2008/03/25/business/25bear.html>; *JPMorgan to Buy Bear Stearns for \$2 a Share*, ASSOCIATED PRESS, Mar. 17, 2008, <http://www.msnbc.msn.com/id/23662433/>.

⁹⁰ Gina Francolla, *Bear Stearns Loses Over \$19 Billion in Market Cap from Its High*, CNBC, Mar. 17, 2008, http://www.cnbc.com/id/23679437/Bear_Stearns_Loses_Over_19_Billion_in_Market_Cap_From_its_High.

⁹¹ *Case Study: The Collapse of Lehman Brothers*, INVESTOPEDIA (Apr. 2, 2009), <http://www.investopedia.com/articles/economics/09/lehman-brothers-collapse.asp>.

⁹² See Disclosure Statement for Third Amended Plan, *supra* note 73, Exhibit 19-11 to -12 (describing Lehman's sources of equity); *id.* Exhibit 4 (providing no recovery for LBHI equity interests).

⁹³ Apart from losses incurred by hedge funds with exposure to Lehman Brothers International (Europe) (LBIE), *see infra* Part I.B.3, this paper does not directly consider losses arising from parties' exposure to Lehman entities that did not file for bankruptcy in the United States. However, non-U.S. Lehman entities accounted for the vast majority of guarantee claims filed by LBHI affiliates, so developments in the United States could have a large impact on recoveries from foreign entities.

part explains why asset interconnectedness has proven to be less problematic than some had feared.

a. Creditors as a Whole

The Lehman bankruptcy implicates a vast number of affiliate and third-party creditors with a dizzying array of connections to the failed firm, but as in any other bankruptcy, the magnitude of losses ultimately borne by creditors in the Lehman case will be a function of two fundamental factors: the realizable value of the assets of the estate and the total claims against these assets. Having been confirmed, the Modified Third Amended Plan will dictate how Lehman’s assets are distributed and thus, provides a reasonable baseline for expected losses. Figure 1.1 below details this baseline, illustrating the Modified Third Amended Plan’s projected recoveries and losses for key groups of creditors.

Figure 1.1: Projected Recoveries of Key Creditors Under Modified Third Amended Plan⁹⁴
\$ billions

Creditor	Allowed Claims	Estimated Recovery	% Recovery	Estimated Loss
LBHI secured	\$2.5	\$2.5	100.0%	\$0.0
LBHI senior unsecured (i.e., Lehman bondholders)	83.7	17.7	21.1%	66.1
LBHI third-party guarantee	52.7	6.4	12.2%	46.3*
LBHI general unsecured	11.4	2.3	19.9%	9.1
LBSF general unsecured (i.e., OTC derivatives counterparties)**	22.7	9.1	40.0%	13.6
Total	\$173.0	\$38.0	22.0%	\$135.0

* Third-party guarantee creditors also likely have direct claims against other Lehman entities, so the figure shown here overstates their actual losses. For example, as explained in the note below and illustrated by row five of the table, derivatives creditors holding direct claims against LBSF and guarantee claims against LBHI are likely to recover well over 12.2%.

** This reflects a blended recovery under the assumption that all LBSF unsecured creditors are also creditors to LBHI per third-party guarantees. As discussed further below, this assumption is reasonable given that nearly all derivatives contracts were subject to LBHI guarantees. Creditors to LBSF also holding an LBHI guarantee would receive an approximately 40.0% recovery because the projected recovery to LBSF general unsecured creditors alone is 27.9% and the projected recovery to creditors holding an LBHI third-party guarantee is 12.2% (see row three of the table).

For the purposes of this report, however, the above projections are of limited value. For one, as the plan warns, “actual results may differ from estimated recoveries” because of the uncertainty of the realizable values of Lehman’s assets.⁹⁵ And even if there were no such uncertainty, analysis of plan recoveries several years removed from LBHI’s filing would still

⁹⁴ See Disclosure Statement for Third Amended Plan, *supra* note 73, Exhibit 4. In this table and the text and tables that follow, all claims and recovery data for the Modified Third Amended Plan are based on information from the disclosure statement for the Third Amended Plan.

⁹⁵ *Id.* Exhibit 4-1.

have limited relevance to an assessment of the ramifications of interconnectedness. Analysis of loss expectations in the direct aftermath of the LBHI filing is far more important because interconnectedness stands to cause the most problems immediately following the failure of a systemically important institution, when the financial system is most fragile. With a view to assessing loss expectations, this section therefore focuses on the magnitude and nature of third-party exposure to LBHI and its Chapter 11 affiliates and, to a lesser degree, the recoveries that third parties expected or had reason to expect from the estate. It finds that the exposure, between \$150 billion and \$250 billion, was not destabilizing, and that creditors could have reasonably expected to recover on a non-negligible portion of their claims.

i. Third-Party Exposure to LBHI and Its U.S. Affiliates

Figure 1.2: Claims Filed Against LBHI and Affiliated Chapter 11 Debtors⁹⁶
\$ billions

Claim Type	Filed	Initial Plan (Apr. 2010)		Modified Third Amended Plan (Aug. / Dec. 2011)*	
		Outstanding	Allowed	Outstanding	Allowed
Direct	\$210	\$183	\$102	\$110	\$110
Intercompany	80	56	43	52	52
Guarantee	570	367	115	156	108
Third-Party	255	143	94	97	95
Affiliate	315	224	21	59	13
Total LBHI Claims	\$860	\$605	\$260	\$320	\$273
All Other Debtors	302	135	135	50	89
	\$1,162	\$740	\$395	\$370	\$362

* Claims data has been made available only for the Third Amended Plan, but the Modified Third Amended Plan is presumably based on the same claims data as the Third Amended Plan. Thus, in the claims context, all references in this report to the Modified Third Amended Plan are based on information from the disclosure statement for the Third Amended Plan.

The claims data from the Initial and Modified Third Amended Plans provide a clear picture of the magnitude and sources of third-party exposure to Lehman. As Figure 1.2 indicates, \$1.162 trillion in claims were initially filed against LBHI and its affiliated U.S. debtors,⁹⁷ but, for several reasons, this number is at least around four times higher than the most relevant real exposure figure.

⁹⁶ Numbers may not add up due to rounding or, in the case of the Third Amended Plan, the exclusion of (a negligible amount of) priority and secured claims. See ALVAREZ & MARSAL, LEHMAN BROTHERS HOLDINGS INC.: THE STATE OF THE ESTATE 23 (Sept. 22, 2010) (for the first three columns); Disclosure Statement for Third Amended Plan, *supra* note 73, Annex A-2, A-3 (for the final two columns).

⁹⁷ ALVAREZ & MARSAL, *supra* note 96, at 23. Note that these figures from the estate's September 2010 update do not precisely match the "Filed amount per Epiq" in the disclosure statement for the Initial Plan.

First, only about 50% of the initially filed claims—around \$570 billion—were actually brought by third parties as opposed to Lehman affiliates.⁹⁸ The claims of Lehman entities in Chapter 11 against other such Lehman entities have no impact on the overall recovery of third parties. They are thus of limited value in assessing the fallout from LBHI’s filing. On the other hand, to the extent that they represent otherwise unasserted third-party claims, the claims of Lehman entities not involved in Chapter 11 proceedings (that is, foreign affiliates) are relevant. However, many claims associated with foreign affiliates have been asserted, i.e., have actually been filed, as third-party claims in the U.S. proceedings. Such claims include LBHI guarantee claims arising from prime brokerage agreements implicating LBIE (discussed in Part I.B.3) and LBHI guarantee claims stemming from structured securities issued by several European affiliates (discussed in Part I.B.4).

The second factor suggesting that filed claims vastly exaggerate relevant exposure is that third-party claims themselves overstate third-party exposure. Many third-party claims were filed twice—once as a primary claim against an LBHI affiliate and once as a so-called “third-party guarantee claim” against LBHI on account of its guarantee of the affiliate. Underscoring the extent of such double filing, about \$144 billion in primary third-party claims were initially filed against an LBHI affiliate,⁹⁹ and \$255 billion in third-party guarantee claims were filed against LBHI.¹⁰⁰ Regardless of the propriety of permitting third-party guarantee claims—an issue that was at the core of the substantive consolidation debate—it is clear that when the same underlying obligation supports multiple claims, total claims overstate total underlying obligations.

A larger source of overstatement than guarantee claims are invalidly filed claims. In the First Amended Plan, the estate reduced the \$775 billion in total then-filed claims to a \$367 billion “estimate of claim amounts” on the ground that many filed claims were inappropriate because they were duplicative, overstated, or unrelated to any liability of a Lehman debtor in Chapter 11.¹⁰¹ Most of these reductions involved third-party claims, which were decreased from

⁹⁸ Disclosure Statement for Initial Plan, *supra* note 15, Annex A-2.

⁹⁹ *Id.* Annex A-4.

¹⁰⁰ *Id.* Annex A-3.

¹⁰¹ Disclosure Statement for First Amended Plan, *supra* note 54, Exhibit 6-2; *see id.* Exhibit 6-3 to 6-6 (describing various grounds for adjustment).

the \$525 billion filed as of December 2010 to \$247 billion.¹⁰² Significantly, these adjustments were not dependent on the resolution of the substantive consolidation dispute and were carried through to the Modified Third Amended Plan.

Figure 1.3: Third-Party Exposure to LBHI and Affiliated U.S. Debtors¹⁰³
\$ billions

Modified Third Amended Plan (August / December 2011)		
Claim Type	Outstanding	Allowed
Non-Third-Party	\$122	\$116
Third-Party	246	242
<i>Guarantee</i>	97	95
<i>Non-Guarantee</i>	149	147

* Estimated Allowed Claims reflect further adjustments made by the estate pursuant to provisions specific to the Modified Third Amended Plan.¹⁰⁴

Taken together and illustrated by Figure 1.3, the preceding factors imply a relatively low level of relevant exposure to LBHI and its U.S. debtor affiliates. If one focuses on only third-party claims and within this subset, just those claims deemed valid by the estate,¹⁰⁵ one is left with just \$242 billion in unsecured third-party exposure according to the Modified Third Amended Plan.¹⁰⁶ Moreover, as third-party guarantee claims constitute \$97 billion of this amount¹⁰⁷ and most of these claims were also filed as primary claims, the amount of unique third-party claims—and thus, the true level of third-party exposure—is closer to \$150 billion.

This relatively low amount of third-party exposure may be attributed to Lehman’s capital structure, especially its use of secured financing arrangements as opposed to unsecured borrowings that give rise to unsecured claims. Specifically, as of August 31, 2008, Lehman had approximately \$157 billion of repo and \$35 billion of securities lending obligations, which

¹⁰² See *id.* Annex A-2.

¹⁰³ Numbers may not add up due to rounding. See Disclosure Statement for Third Amended Plan, *supra* note 73, Annex A-2.

¹⁰⁴ See *id.* Exhibit 6-2 to 6-8 (describing the plan-specific adjustments).

¹⁰⁵ The estate’s characterization of claims has been subject to dispute. While one might argue that the estate’s estimates therefore understate economic exposure, these estimates are still the most reliable basis for analysis. Further, slightly higher estimates would not materially change the thrust of this paper’s findings.

¹⁰⁶ Disclosure Statement for Third Amended Plan, *supra* note 73, Annex A-2. Secured claims allowed under the Modified Third Amended Plan are omitted from all claims analysis because the estate does not include them in its estimate of claim amounts (it adds them as a plan adjustment), these claims are small in magnitude (\$3.4 billion), and they are projected to receive 100% recovery. See *id.* Exhibit 5, Annex A-2.

¹⁰⁷ *Id.* Annex A-2.

together eclipsed the firm's approximately \$136 billion of long-term unsecured debt and \$4 billion of commercial paper.¹⁰⁸ Had Lehman financed a greater share of its borrowings with unsecured debt, unique third-party claims would have been larger. So, in this sense, Lehman's capital structure arguably *mitigated* systemic risk after its failure. At the same time, the probability of failure in the first place might have declined had Lehman been less reliant on fickle, short-term secured financing and instead funded more of its operations on a long-term, unsecured basis.

The long-term unsecured financing that Lehman did rely on is the largest source of third-party exposure. In particular, the Modified Third Amended Plan estimated that about \$84 billion in claims were validly filed on account of senior unsecured debt securities—that is, bonds—issued by LBHI.¹⁰⁹ Not only is this exposure small relative to the firm's repo exposure, but it was also likely spread across a variety of parties at the time of LBHI's filing. Standard & Poor's estimates that, as of the filing date, “a broad range of institutions, not just large capital markets players, . . . h[e]ld . . . this paper.”¹¹⁰ However, *after* the filing, exposure may have become more concentrated as several large hedge funds that would later form the Ad Hoc Group opportunistically purchased senior unsecured claims.¹¹¹

Relative to bonds, exposure to loans and other debt not classified as securities (accounting for about \$20 billion of initially filed claims¹¹²) appears to have been more concentrated before the filing, for a large amount of such debt seems to have stemmed from loans made by major Japanese banks.¹¹³ On account of their sizable portfolio of Lehman bonds and loans, Japanese banks and insurers announced a combined \$2.4 billion in potential losses

¹⁰⁸ Disclosure Statement for First Amended Plan, *supra* note 54, Exhibit 9-8 to 9-9.

¹⁰⁹ Disclosure Statement for Third Amended Plan, *supra* note 73, Annex A-2.

¹¹⁰ Standard & Poor's, *Broader Lessons from Lehman Brothers' Bankruptcy*, RATINGSDIRECT, Sept. 17, 2008, at 3.

¹¹¹ See Eric Morath, *Paulson Pounced on Lehman's Fall and Bought Cheap Debt*, WALL ST. J., Apr. 25, 2011, <http://online.wsj.com/article/SB10001424052748704677404576285102319041030.html> (noting that four hedge funds each purchased \$1 billion in, mainly senior unsecured, claims after the filing).

¹¹² Disclosure Statement for Initial Plan, *supra* note 15, Annex A-3, Exhibit 4-1.

¹¹³ Takahiko Hyuga et al., *Japan Banks, Insurers Have \$2.4 Billion Lehman Risk*, BLOOMBERG, Sept. 17, 2008, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a3mSQ9tXT.5w&refer=japan>.

from their holdings during the week following LBHI's filing.¹¹⁴ The Bank of Japan, however, did not view this sum as large enough to threaten the stability of the Japanese financial system.¹¹⁵

Beyond senior unsecured debt securities, OTC derivatives accounted for the largest source of third-party exposure. In fact, derivatives claims were filed in greater amounts than unsecured debt claims, but they have also been reduced to a much greater degree. According to the Initial Plan, about \$150 billion in derivatives claims were filed, half as primary claims against an LBHI affiliate—generally, LBSF—and half as guarantee claims against LBHI.¹¹⁶ Apart from the fact that these claims are duplicative, both the Initial Plan and, to a greater degree, the Amended Plans indicate that the filings significantly overstate exposure because many are exaggerated and some are invalid. As discussed in Part I.B.2, the estate has expressed particular skepticism about the size of OTC derivatives claims filed by large financial institutions (so-called “Big Bank” claims).¹¹⁷ Additionally, it has refused to recognize at least some of the derivatives-related claims stemming from certain structured vehicles such as minibonds, which are discussed in Part I.B.4.b.¹¹⁸ As a result, the estate sizably reduced estimated primary and guarantee derivatives claims, cutting the former to \$30 billion in the Modified Third Amended Plan.¹¹⁹

Another important class of claims stems from instruments that often embedded derivatives—structured securities that Lehman issued to obtain funding, primarily in connection with its European Medium Term Note (EMTN) Program.¹²⁰ According to the estate's estimates in the Modified Third Amended Plan, about \$30 billion of these securities were issued by Lehman Brothers Treasury Co. N.V. (LBT), a Netherlands affiliate, and about \$5.5 billion were issued directly by LBHI.¹²¹ A large number of third parties filed claims relating to the products in Lehman's U.S. proceedings either because the instruments were issued by LBHI directly or

¹¹⁴ *Id.*

¹¹⁵ *Id.*

¹¹⁶ Disclosure Statement for Initial Plan, *supra* note 15, Annex A-2.

¹¹⁷ See Disclosure Statement for First Amended Plan, *supra* note 54, Exhibit 6-5; Disclosure Statement for Third Amended Plan, *supra* note 73, Exhibit 6-5 to 6-6. See also *infra* text accompanying notes 200, 232.

¹¹⁸ See Disclosure Statement for First Amended Plan, *supra* note 36, Exhibit 6-5; Disclosure Statement for Third Amended Plan, *supra* note 73, Exhibit 6-5 to 6-6.

¹¹⁹ Disclosure Statement for Third Amended Plan, *supra* note 73, Annex A-2.

¹²⁰ See *id.* Exhibit 19-9.

¹²¹ *Id.* Exhibit 11-1.

because they were guaranteed by LBHI.¹²² To be sure, these claims suggest a level of exposure to the securities that was substantial in amount and complexity. But, as Part I.B.4 emphasizes, the instruments did not in fact pose systemic risks because of their wide, substantially retail investor base and small denominations.

Two other types of third-party claims bear mention, though the estate greatly reduced the estimated amounts of both. First, more than \$73 billion in claims were filed in connection with Lehman's obligations to either repurchase residential mortgage loans or indemnify loan purchasers for losses arising from breaches of loan purchase and sale agreements.¹²³ The estate asserted, however, that these repurchase and indemnity claims were significantly duplicated, overstated, and unsubstantiated.¹²⁴ The Modified Third Amended Plan accordingly estimates that exposure from these claims amounted to only about \$10.4 billion.¹²⁵

Second, as discussed further in Part I.B.3, a total of approximately \$22 billion in claims were filed against LBHI and its affiliated Chapter 11 debtors in connection with prime brokerage agreements, typically involving LBI or LBIE.¹²⁶ Yet the Modified Third Amended Plan does not view any of these claims as valid.¹²⁷ Unlike the mortgage-related claims, however, the estate's main contention is not that parties do not stand to suffer the losses alleged but rather that their claims are not actionable against LBHI and its affiliated Chapter 11 debtors because these entities were not part of the agreements at issue.¹²⁸ The estate's reasoning does not therefore rule out the possibility that Lehman prime brokerage arrangements were a cause of interconnectedness problems unrelated to the Lehman entities in Chapter 11 proceedings. But investigating the matter further, Part I.B.3 finds this not to be the case and concludes that the fallout from the collapse of Lehman's prime brokerage operations was limited primarily because of the small size of these operations.

¹²² *See id.* at 49.

¹²³ *Id.* at 52.

¹²⁴ *See id.* Exhibit 6-3.

¹²⁵ *Id.*

¹²⁶ *See id.* Exhibit 6-4.

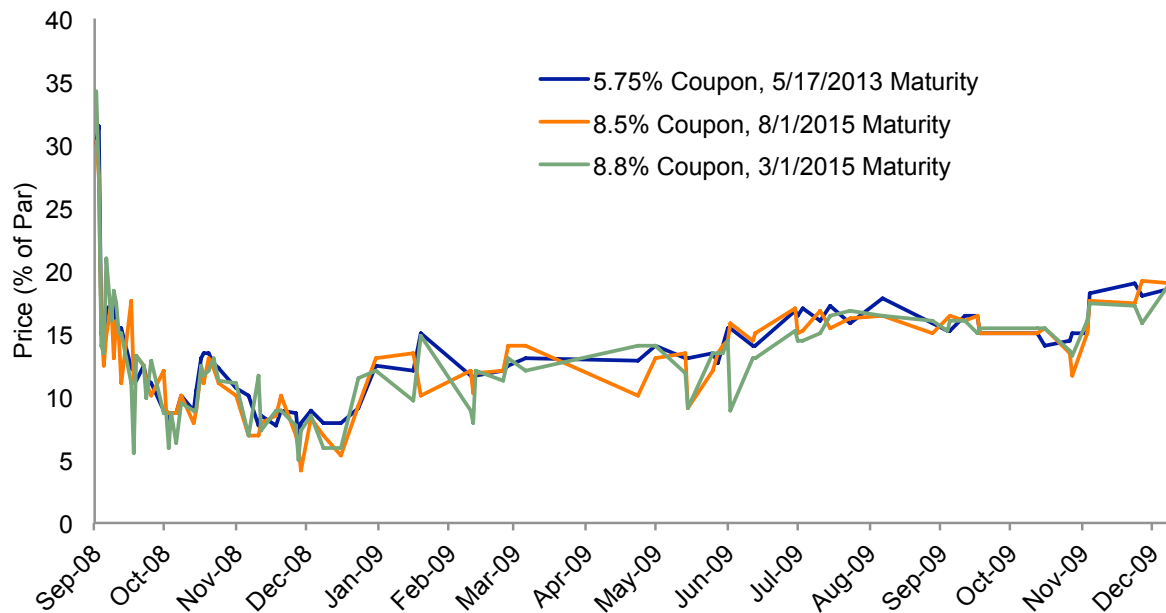
¹²⁷ *See id.*

¹²⁸ *See id.*

ii. Loss Expectations

The preceding subsection concluded that third-party exposure to LBHI and its U.S. debtor affiliates was not destabilizing. Notably, this conclusion was unrelated to estimates about the value of the Lehman estate. Thus, even if parties had reason to assume that the estate had no assets and that they would not recover anything, asset interconnectedness would still not have been a significant problem in the immediate aftermath of LBHI's filing. Further, as this subsection establishes, all parties had reason to believe that they would recover something, and certain parties had reason to expect fairly substantial recoveries.

Figure 1.4: Representative LBHI Senior Unsecured Bond Trading Prices¹²⁹



We can start with senior unsecured bondholders, the largest source of third-party exposure. Figure 1.4 illustrates that even at their lows, prices of LBHI bonds and by extension LBHI senior unsecured claims were always well above zero in the aftermath of LBHI's filing. To be sure, having traded above seventy cents the week before LBHI's filing, LBHI bond prices fell precipitously as a result of it. Moreover, prices fell further in the weeks following the filing, declining from about thirty cents on September 15 to less than ten cents in October in part because the Lehman CDS auction (discussed in Part I.B.2.b) settled at an implied recovery of

¹²⁹ Bloomberg.

only 8.625% that month.¹³⁰ But this decline reversed after December as prices headed steadily upward, in line with the projected recoveries of subsequently proposed plans.¹³¹

Parties holding claims against LBHI subsidiaries guaranteed by LBHI had even more reason for optimism. In the months leading up to the September 2009 claims bar date, expected recoveries on LBSF claims with LBHI guarantees rose from about twenty cents to approximately forty cents as market participants believed that they would be able to seek recovery from both the obligor (LBSF) and the guarantor (LBHI) on the contracts.¹³² An additional factor driving this optimism was likely the state of LBSF's balance sheet, which held \$21.6 billion in derivatives receivables compared to just \$11.9 billion in payables as of June 2009.¹³³ The effect of this early optimism surrounding LBSF claims was particularly significant because sellers of LBSF claims during this period were primarily large broker-dealers while buyers were hedge funds specializing in distressed debt.¹³⁴ The buoyant market thus allowed for systemically risky institutions to off-load Lehman exposure at meaningful recovery levels and—with transfers of Lehman claims totaling approximately \$4.4 billion in 2009, \$28.7 billion in 2010, and \$32.4 billion in 2011¹³⁵—in meaningful amounts.

¹³⁰ See *infra* Part I.B.2.b.

¹³¹ Even the Non-Consolidation Plan—the least favorable of the plans to LBHI senior unsecured creditors—would have provided for a 16.0% recovery. Disclosure Statement for Non-Consolidation Plan, *supra* note 65, at 18.

¹³² See Seth Brumby & Nicoletta Kotsianas, *Lehman Brothers Special Financing's Derivatives Claims Secondary Market Grows After Proof-of-Claims Revision*, DEBTWIRE, July 8, 2009; Fineman & Scinta, *supra* note 81.

¹³³ ALVAREZ & MARSAL, LEHMAN BROTHERS HOLDINGS INC.: § 341 MEETING 21 (July 8, 2009).

¹³⁴ See Brumby & Kotsianas, *supra* note 132.

¹³⁵ SECONDMARKET, CLAIMS TRADING: YEAR IN REVIEW, 2010, 6 (2011); *2011 Year-in-Review Bankruptcy Claims Trading Report*, SECONDMARKET (Jan. 27, 2012), <https://www.secondmarket.com/discover/reports/2011-year-in-review-bankruptcy-claims-trading-report#lehman>.

Figure 1.5: Expected Recoveries for LBHI and Affiliates (with LBHI Guarantees)¹³⁶
 \$ billions

	August 2009 Claims Pricing Range	Est. Primary Third-Party Exposure
LBHI	16% – 18%	\$110.4
Leh. Bros. Special Financing	42% – 43%	\$24.6
Leh. Bros. Commercial Paper	28% – 32%	\$8.0
Leh. Bros. Commodity Services	49% – 50.5%	\$2.4
Leh. Bros. Commercial Corp.	28% – 30%	\$0.6
Leh. Bros. OTC Derivatives	20% – 25%	\$0.6
Leh. Bros. Derivatives Products	28% – 32%	\$0.08

Furthermore, early claims trading prices indicate that LBSF claims were far from the only Lehman claims expected to produce meaningful recoveries. As Figure 1.5 illustrates, the view of the market preceding the claims bar date was that claims against several key LBHI affiliates subject to LBHI guarantees would all deliver recoveries in excess of twenty cents on the dollar. Moreover, the rising expected recoveries for claims against LBHI affiliates were predicated on the belief that LBHI guarantees would be recognized and thus, that the estate would not be substantively consolidated.

The fact that substantive consolidation was a matter of intense debate does not diminish the significance of the market’s early assumption that guarantees would be recognized. Rather, for assessing the fallout of interconnectedness, what the market believed in the immediate aftermath of the collapse about the magnitude of creditor recoveries is far more important than why it held this belief. More importantly, the market’s aggregate view of recoveries was driven not by views on substantive consolidation, but rather by expectations on the amount of distributable assets. After all, the only effect of substantive consolidation would have been to simply redistribute recoveries without changing the total amount that could be recovered.

Not only were early market recovery expectations thus fundamentally driven by the belief that the Lehman estate had significant recoverable assets, but this belief was reasonable. Indeed,

¹³⁶ See Disclosure Statement for Third Amended Plan, *supra* note 73, Annex A-3 to A-8, A-11 (for estimated primary third-party exposure); William David Tobin & Alex Brook, *The Case for Auctioning Lehman Brothers Unsecured Claims Now*, MISSION CAPITAL ADVISORS, at 1-2 (for claims pricing range). The estimated primary third-party exposure figure represents the Third Amended Plan’s estimate of third-party claim amounts excluding third-party guarantees. Third-party guarantees are excluded to avoid double counting because the estimated claims ranges for LBHI include the effect of the guarantees.

even under a rapid liquidation, the estate estimated that as of the end of 2009, LBHI and its affiliated Chapter 11 debtors would yield \$43 billion to creditors.¹³⁷ And such a stressed liquidation would have been value-destructive because of, inter alia, the magnitude and complexity of claims,¹³⁸ the illiquidity of certain assets,¹³⁹ and the likelihood that bidders, particularly for private equity and principal investments, would purchase only at large discounts, knowing that the estate had to sell.¹⁴⁰ Thus, with liquidation stretched out over five years, the Initial Plan projected a substantially greater recovery—about \$66 billion on an undiscounted basis.¹⁴¹ And, based on the debtors’ balance sheets as of the end of the first half of 2010, the First Amended Plan projected notably higher recoveries than did the Initial Plan, as it estimated that rapid liquidation would yield about \$54 billion to creditors and orderly liquidation about \$75 billion.¹⁴² Moreover, based on data as of May 2011, the Modified Third Amended Plan has projected still higher recoveries, estimating that a rapid liquidation would generate about \$59 billion and an orderly liquidation would produce about \$76 billion in distributable value.¹⁴³

While all of the above figures underscore the reasonableness of the market’s belief that the Lehman estate would yield non-negligible recoveries to creditors, the Initial Plan’s estimates are particularly significant. As they derive from balance sheet information closer to the date of the filing than do the Amended Plans’ estimates, they better reflect what an informed creditor in the aftermath of the filing might have believed. Simply put, in the face of numbers even loosely similar to those in the Initial Plan, a creditor would be hard pressed to contend that it expected zero recovery.

This conclusion is not inconsistent with claims made by the estate and, more recently, the FDIC, that LBHI’s filing was itself highly value-destructive. In this regard, the estate has suggested that as much as \$75 billion in value may have been destroyed by the chaotic, hurried

¹³⁷ See Disclosure Statement for Initial Plan, *supra* note 15, Exhibit 5.

¹³⁸ See *id.* Exhibit 5-3.

¹³⁹ See *id.* Exhibit 5-4.

¹⁴⁰ See *id.* Exhibit 5-5.

¹⁴¹ See *id.* Exhibit 5.

¹⁴² See Disclosure Statement for First Amended Plan, *supra* note 54, Exhibit 5.

¹⁴³ See Disclosure Statement for Third Amended Plan, *supra* note 73, Exhibit 5.

nature of the filing.¹⁴⁴ Further, the FDIC has argued that an orderly liquidation under Title II of the Dodd-Frank Act may have resulted in far faster and larger recoveries for general unsecured creditors, potentially providing them with as much as ninety-seven cents on the dollar.¹⁴⁵ Even if the FDIC's projections are credible—and it has been strongly argued that they are not¹⁴⁶—they do not undermine the finding that LBHI's actual filing did not and could not have been expected to impose destabilizing losses on creditors. Perhaps a different liquidation procedure might have resulted in larger and speedier recoveries. But, as flawed as the actual procedure may have been, it did not destroy all value. Rather, significant value remains in the Lehman estate, as creditors seem to have long recognized.

b. Derivatives Counterparties

This section examines the exposure of derivatives counterparties with respect to Lehman and concludes that their exposures did not pose systemic risk. At the time, derivatives, particularly OTC contracts, fueled significant concerns among market observers who feared that positions to which Lehman was a counterparty or for which Lehman was a reference entity could lead to substantial losses among major financial institutions upon Lehman's collapse.¹⁴⁷ Indeed, Lehman's failure had the potential to cause three distinct derivatives-related problems. First, and least significantly, because Lehman had a fairly large exchange-traded derivatives portfolio, its failure could have imperiled the clearinghouses and clearing firms with which it dealt. Second, and more significantly, because Lehman was a reference entity on a large number of CDS contracts, its default could have triggered a massive payout that parties who had sold Lehman CDS could not make. Third, and most significantly, because Lehman was party to a large

¹⁴⁴ See Jeffrey McCracken, *Lehman's Chaotic Bankruptcy Filing Destroyed Billions in Value*, WALL ST. J., Dec. 29, 2008, <http://online.wsj.com/article/SB123050916770038267.html>.

¹⁴⁵ See Fed. Deposit Ins. Corp., *The Orderly Liquidation of Lehman Brothers Holdings Inc. Under the Dodd-Frank Act*, 5 FDIC Q. 18 (2011).

¹⁴⁶ See, e.g., Stephen J. Lubben, *The F.D.I.C.'s Lehman Fantasy*, DEALBOOK, Apr. 29, 2011, <http://dealbook.nytimes.com/2011/04/29/the-f-d-i-c-s-lehman-fantasy/> (arguing that “some of the [FDIC] report seems to rest on pure fantasy”).

¹⁴⁷ See, e.g., *Hearing Before the H. Comm. on Fin. Servs.*, 111th Cong. 1 (Apr. 20, 2010) (statement of Henry M. Paulson, Jr.), http://www.house.gov/apps/list/hearing/financialsvcs_dem/paulson_testimony_-_4.20.10.pdf (noting that “[t]he possibility of a Lehman failure especially concerned [him] because [of]...how deeply interconnected the firm was with various other parts of our financial system [through]...[a]mong other things, [its] derivatives contracts”). See also Gary Gensler, *Clearinghouses Are the Answer*, WALL ST. J., Apr. 21, 2010, http://online.wsj.com/article/NA_WSJ_PUB:SB10001424052748704671904575194463642611160.html (arguing that “interconnectedness is a direct result of the unregulated over-the-counter derivatives market where financial institutions are contractually obligated to each other through trillions of dollars of derivatives contracts”).

number of OTC derivatives, its failure to honor its contracts could have left counterparties as unsecured creditors and thereby caused crippling write-downs among already weak financial institutions.

This section considers each of these issues in turn and finds that none materialized to the extent that had been feared. In fact, the first two problems did not surface at all. The third problem, stemming from Lehman's OTC derivatives exposure, has arisen but, regardless of how unsecured derivatives creditors ultimately fare, it has not surfaced in the catastrophic fashion that some had warned of. Indeed, as explained by one commentator analyzing the muted fallout from Lehman's failure, "the fact remains that derivative transactions were terminated quickly and efficiently, . . . no major counterparties slid into bankruptcy, parties were eventually able to re hedge their positions[,] and quality collateral was fairly ubiquitous."¹⁴⁸

While this section primarily investigates the impact of Lehman's failure on derivatives counterparties, the opposite issue—the effect of derivatives counterparties on Lehman's failure—also bears mention, for the behavior of worried counterparties exacerbated Lehman's funding crisis preceding its collapse. Like Bear Stearns, Lehman was subject to substantial "novations" as OTC derivatives counterparties asked other dealers to take on the Lehman contracts and thus assume the hobbled investment bank's credit risk.¹⁴⁹ By insulating themselves from Lehman's default in this way, counterparties made such a default more likely because they stripped Lehman of valuable cash collateral, specifically the initial margin they had posted with Lehman.¹⁵⁰ Lehman's new dealer-counterparties did not replace this collateral since initial margins are typically not posted in dealer-to-dealer transactions. While novations certainly

¹⁴⁸ Kimberly Anne Summe, *An Examination of Lehman Brothers' Derivatives Portfolio Post-Bankruptcy and Whether Dodd-Frank Would Have Made Any Difference*, in RESOLUTION OF FAILED FINANCIAL INSTITUTIONS: ORDERLY LIQUIDATION AUTHORITY AND A NEW CHAPTER 14, at 3-1, 3-28 (Hoover Inst. Working Grp. on Econ. Pol'y, Resolution Project, Apr. 24, 2011); accord Peter J. Wallison, *The Error at the Heart of the Dodd-Frank Act*, AMER. ENTERPRISE INST. FIN. SERVS. OUTLOOK, Aug.-Sept. 2011, at 5.

¹⁴⁹ See, e.g., William C. Dudley, President and Chief Executive Officer of the Federal Reserve Bank of New York, More Lessons from the Crisis n.3 (Nov. 13, 2009), <http://www.newyorkfed.org/newsevents/speeches/2009/dud091113.html>; Darrell Duffie, Ada Li & Theo Lubke, *Policy Perspectives on OTC Derivatives Market Infrastructure* 11 (MFI Working Paper Series, No. 2010-002, Jan. 2010), <http://mfi.uchicago.edu/publications/papers/policy-perspectives-on-otc-derivatives-market-infrastructure.pdf>; see also Darrell Duffie, *The Failure Mechanics of Dealer Banks*, J. ECON. PERSP. 51, 65 (Winter 2010) (discussing novations of Bear Stearns counterparties).

¹⁵⁰ See Duffie, Li & Lubke, *supra* note 149, at 11 & n.18.

deprived Lehman of a source of short-term funding, collateral demands from Lehman's clearing banks appear to have played a far larger role in stripping the firm of liquidity in its final days.¹⁵¹ Further, tri-party repo, not initial margin posted by derivatives counterparties, was by far Lehman's most important source of short-term funding.¹⁵² Even so, to the extent that it might have mitigated liquidity pressures on Lehman by reducing the likelihood of derivatives counterparty runs, a greater degree of central clearing might have benefited Lehman, not to mention its counterparties. This section I.A.2.b briefly discusses central clearing as a mitigating factor for Lehman's counterparties while Part 1C offers a fuller account of the benefits and limitations of central clearing more generally. And this section begins with a discussion of another class of derivatives for which counterparties did not directly bear Lehman's credit risk—Lehman's exchange-traded portfolio.

i. Exposure to Lehman's Exchange-Traded Derivatives

As one would expect from the relative sizes of the exchange-traded derivatives universe and the OTC derivatives market (with the former only about 10% as large as the latter),¹⁵³ Lehman's exchange-traded derivatives portfolio was far smaller than its OTC holdings. Even so, the handling of its exchange-traded derivatives merits consideration. Though small relative to its OTC portfolio, Lehman's exchange-traded holdings were far from insignificant: as a clearing member of each of the four Chicago Mercantile Exchange (CME) designated contract markets, LBI accounted for over 4% of the aggregate margin requirements of all CME clearing members and maintained roughly \$2 billion in collateral and clearing deposits connected to proprietary positions that it held on behalf of itself and other LBHI affiliates.¹⁵⁴

¹⁵¹ See 4 Examiner's Report, *supra* note 17, at 1464.

¹⁵² See LEHMAN BROTHERS, LIQUIDITY MANAGEMENT AT LEHMAN BROTHERS 11 (July 2008), <http://www.jenner.com/lehman/docs/debtors/LBEX-DOCID%20009007.pdf> (noting that "[s]hort term secured financing represents the largest source of secured funding"); Disclosure Statement for Revised Third Amended Plan, *supra* note 73, Exhibit 19-8 to 19-9 (noting that Lehman had about \$157 billion in repurchase obligations as of August 31, 2008, which constituted about 79% of its short-term financing).

¹⁵³ The Bank for International Settlements (BIS) estimates that, as of the end of 2011, the notional amount of global OTC derivatives was \$647 trillion (up from \$601 trillion in 2010), while the notional amount of global listed derivatives was \$57 trillion (down from \$68 trillion in 2010). See *Statistical Annex*, BIS Q. REV., June 2012, at A131 tbl.19, A136 tbl.23A.

¹⁵⁴ See 5 Examiner's Report, *supra* note 17, at 1841, 1843, 1845.

The firm's exchange positions, transferred within three days of LBHI's filing, not only were resolved much more quickly than its OTC derivative holdings but also—more significantly from an interconnectedness standpoint—imposed no losses on counterparties. Owing to the large size of Lehman's exchange positions, which the CME feared would be difficult for the market to digest in an open market sale,¹⁵⁵ the CME selected six firms from which to solicit bids on LBI's proprietary positions and delivered information to these institutions about LBI's positions on Sunday, September 14, 2008.¹⁵⁶ Based on this private auction process—the first ever such forced transfer of a clearing member's positions¹⁵⁷—all of LBI's proprietary derivatives as of the end of business on Wednesday, September 17, were transferred: Barclays assumed LBI's energy derivatives portfolio,¹⁵⁸ Goldman Sachs assumed its equity derivatives portfolio,¹⁵⁹ and DRW Trading assumed its foreign exchange, interest rate, and agricultural derivatives portfolios.¹⁶⁰ These institutions did not take on this risk for free, and indeed, the Examiner found that LBI could have a colorable claim against these firms and the CME for losses owing to the “steep discount” at which the positions were purchased.¹⁶¹ But the possible existence of such a claim does not affect the finding that Lehman's exchange-traded portfolio did not impose losses—destabilizing or otherwise—on the firm's exchange counterparties or the CME and thus, did not produce an interconnectedness problem.

ii. Exposure to CDS Referencing Lehman

Unlike potential concerns relating to either Lehman's exchange-traded derivatives discussed above or its OTC derivatives discussed below, the fear surrounding CDS referencing Lehman was that *other* parties—with no connection to Lehman whatsoever—would not be able to make good on their obligations. This fear arose because Lehman was a popular reference entity on CDS, and the aggregate CDS payout on its default was expected to be quite large given

¹⁵⁵ *Id.* at 1845.

¹⁵⁶ *Id.* at 1846. The firms—Barclays, Goldman Sachs, Morgan Stanley, JP Morgan, Citadel, and DRW Trading—were selected on the basis of their capital and risk management expertise as well as market concentration considerations. *Id.*

¹⁵⁷ *Id.* at 1854-55.

¹⁵⁸ *Id.* at 1851.

¹⁵⁹ *Id.* at 1853.

¹⁶⁰ *Id.* at 1852, 1854.

¹⁶¹ *Id.* at 1855.

the low anticipated recovery on its debt.¹⁶² This fear stemmed from two sources. First, typifying the extent to which CDS notional had in many instances grown to surpass the notional value of the debt underlying the contracts, as much as \$400 billion in CDS contracts¹⁶³ had been written on only about \$72 billion of deliverable Lehman bonds.¹⁶⁴ Second, the settlement price in the Lehman CDS auction was expected to be quite low, which meant that the payout per contract (equal to one hundred cents minus the settlement price) was expected to be quite high. And, in fact, the settlement price turned out to be even lower than expected as bond prices were trading at thirteen cents the day before the auction (implying a payout of eighty-seven cents) and the auction settled at 8.625 cents (implying a payout of 91.375 cents).¹⁶⁵ With as much as \$400 billion in outstanding CDS notional, the Lehman CDS settlement auction could have therefore produced an aggregate payout—and thus, direct losses for CDS sellers—of over \$360 billion, by far the most in the history of the CDS market.¹⁶⁶

The fallout from such a payout could have been considerable. Indeed, both the magnitude and the concentration of this loss would have been far more significant than that suffered by creditors to LBHI and its affiliated debtors. As discussed above in Part I.B.1, third-party creditor

¹⁶² See, e.g., Jean Helwege et al., *Credit Default Swap Auctions 1* (Fed. Reserve Bank of N.Y., Staff Rep. No. 372, May 2009) (remarking that “market participants feared that sellers of CDS contracts would face large losses based on the gross notional value of Lehman’s CDS contracts, even though the net value of the positions was substantially smaller”).

¹⁶³ Projections regarding the total notional of CDS written on Lehman span from a low of \$72 billion to the “widely cited industry estimate of \$400 billion.” See Robert Pickel, *Insight: The CDS Sector Is Not the Central Villain*, FIN. TIMES, Oct. 29, 2008, <http://www.ft.com/cms/s/0/9e609634-a5d4-11dd-9d26-000077b07658.html#axzz1LoLthfki> (referring to the \$400 billion estimate); René M. Stulz, *Credit Default Swaps and the Credit Crisis*, 24 J. ECON. PERSP. 73, 80 (Winter 2010) (noting the range).

¹⁶⁴ As explained in Section I.B.1, Lehman had about \$136 billion in senior unsecured debt outstanding around the time of its filing. See *supra* text accompanying note 108. But under the ISDA protocol for the Lehman CDS auction, only about \$72 billion notional of this debt could actually be used by a CDS buyer to physically settle its contract. See Int’l Swaps & Derivatives Ass’n, *Lehman Deliverable Obligations*, http://www.isda.org/companies/lehman/pdf/Lehman_Deliverables.xls.

¹⁶⁵ See Shannon D. Harrington & Neil Unmack, *Lehman Credit-Swap Auction Sets Payout of 91.38 Cents*, BLOOMBERG, Oct. 10, 2008, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aLkOZnNcDmSQ&refer=home>; Helwege et al., *supra* note 162, at 19 tbl.2.

¹⁶⁶ Fannie Mae and Freddie Mac, which also triggered an event of default and thus, a CDS auction, actually accounted for a much larger amount of CDS notional than did Lehman. Although estimates of Fannie and Freddie CDS were on the order of \$1.4 trillion, the CDS payout in these cases was much smaller than in the case of Lehman because the settlement values of Fannie and Freddie CDS were in the nineties (implying a payout of less than ten cents for every dollar of CDS notional). See *Lehman CDS Settlement—The Dog that Didn’t Bark?*, GERSON LEHRMAN GROUP RESEARCH, Oct. 28, 2008, <http://www.glgresearch.com/Council-Member-News/GLG-Expert-Contributor-297381-News-1.html>.

exposure to LBHI and its affiliated debtors was on the order of only \$150 billion to \$250 billion. Moreover, this exposure was spread across a variety of parties. In contrast, it was thought that the \$360 billion in CDS losses would be borne by a concentrated group of systemically important financial institutions assumed to be net sellers of Lehman CDS. Thus, as the Lehman CDS auction approached, these large institutions suffered double-digit percentage declines in their stock prices: on October 9, 2008 (the day before the auction), the shares of Morgan Stanley, Barclays, Goldman Sachs, and JPMorgan dropped 44%, 18%, 16%, and 12%, respectively.¹⁶⁷

Although the auction was ominously expected to be a “day of reckoning,”¹⁶⁸ the “reckoning” proved to be quite small, notwithstanding the lower than expected auction settlement price. For the \$72 billion of Lehman CDS registered in the Depository Trust & Clearing Corporation (DTCC) warehouse, only a total of about \$5.2 billion was actually required to be paid out after the Lehman auction.¹⁶⁹ And there is no evidence that the settlement of CDS not registered through the DTCC proved any more problematic.¹⁷⁰ If the outcome of the Lehman CDS auction thus allayed the worst fears of the market, it should not be seen as fortuitous. To the contrary, the low percentage of funds transferred relative to outstanding CDS notional proved that the Lehman credit event was the rule, not the exception. For example, the Bank of France estimates that the percentage of net funds exchanged relative to total CDS notional was only 3.4% following the Washington Mutual credit event and 6.5% following the collapse of the major Icelandic banks Landsbanki, Glitnir, and Kaupthing.¹⁷¹ In the case of payments on CDS contracts related to Greece, according to the DTCC, the net funds exchanged was \$2.89 billion.¹⁷² With \$80.1 billion of total CDS notional outstanding,¹⁷³ this amounted to a payout of 3.61%.

¹⁶⁷ See Geoffrey Rogow, *The Looming Lehman CDS Unwind*, MARKETBEAT, Oct. 9, 2008, <http://blogs.wsj.com/marketbeat/2008/10/09/the-looming-lehman-cds-unwind/>.

¹⁶⁸ Matthew Goodburn, *Markets Fret over “Day of Reckoning” on Crucial Lehman CDS Auction*, CITYWIRE, Oct. 10, 2008, <http://citywire.co.uk/money/markets-fret-over-day-of-reckoning-on-crucial-lehman-cds-auction/a317207>.

¹⁶⁹ Press Release, Depository Trust & Clearing Corp., DTCC Trade Information Warehouse Completes Credit Event Processing for Lehman Brothers (Oct. 22, 2008), http://www.dtcc.com/news/press/releases/2008/dtcc_processes_lehman_cds.php.

¹⁷⁰ See Stulz, *supra* note 163, at 80.

¹⁷¹ See Anne Duquerroy et al., Banque de France, *Credit Default Swaps and Financial Stability: Risks and Regulatory Issues*, 13 FIN. STABILITY REV. 75, 79 tbl.2 (Sept. 2009).

¹⁷² Press Release, Depository Trust & Clearing Corp., DTCC Successfully Completes Greek CDS Restructuring Credit Event Processing (Mar. 27, 2012).

The low ratio of required payments to outstanding notional can be attributed to the prevalence of offsetting positions,¹⁷⁴ which caused the net exposure for institutions on outstanding CDS holdings—and OTC derivatives more generally—to be far lower than the often-reported figure of notional CDS exposure. Absent such offsetting, overall exposure would have in fact closely tracked reported notional—a result that would have been highly unusual for OTC derivatives. Normally, the oft-cited metric of notional vastly overstates economic exposure. While by June 2008, the OTC market had reached a peak of nearly \$684 trillion in the notional amount of derivatives outstanding,¹⁷⁵ parties would not have suffered anything close to \$684 trillion in losses if all contracts were suddenly breached, for the notional of a derivatives contract is merely the face amount of the contract, a sum that provides the basis for the calculation of each party’s payments to the other. A more appropriate measure of exposure is the fair market value of a contract, which represents the worth of a derivative at mid-market and is far smaller than aggregate notional: the Bank for International Settlements (BIS) estimates that in December 2007, at the dawn of the credit crisis, the “gross market value”¹⁷⁶ of all outstanding OTC derivatives was \$15.8 trillion.

But the Lehman CDS payout did not so much reveal the inappropriateness of notional as a metric for exposure as it did the power of netting, which is also evident in the OTC derivatives market as a whole. For example, in December 2007, the market value of all OTC derivatives was only about \$3.3 trillion after taking into account bilateral netting agreements in all products other than non-U.S. CDS.¹⁷⁷ And there is reason to believe that the netting effect in the CDS market was particularly large, for as the crisis developed, major market participants were able to sizably reduce CDS notional with no effect on net risk. Between December 2007 and December 2009, they compressed outstanding CDS notional from over \$58 trillion to under \$33 trillion by

¹⁷³ Katy Burne, *Nearly \$3 Billion Changed Hands Under Greek CDS Settlement-DTCC*, DOW JONES NEWSWIRES, Mar. 27, 2012.

¹⁷⁴ See, e.g., Helwege et al., *supra* note 162, at 10.

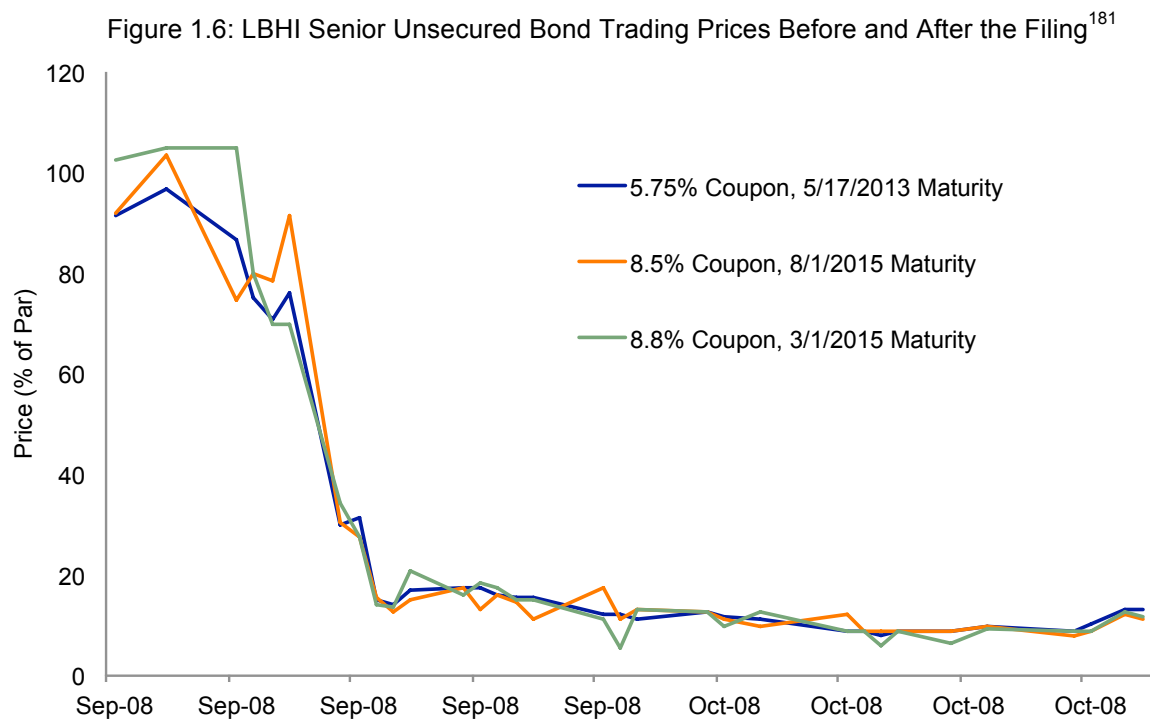
¹⁷⁵ BIS Q. REV. (June 2010), *supra* note 153, at A121 tbl.19.

¹⁷⁶ The BIS calls this market value measure “gross market value” because derivatives are by definition zero sum such that their net market value would be zero. It arrives at the measure by summing the positive market value of all reporting parties’ contracts and, in absolute terms, the negative market value of reporting parties’ contracts with non-reporting parties. *Statistical Annex*, BIS Q. REV., June 2009, at A112 [hereinafter BIS Q. REV. (June 2009)].

¹⁷⁷ See *id.* at A103 tbl.19, A112.

terminating existing positions and replacing them with a smaller number of contracts that matched the overall risk and cash flow profile of their original CDS portfolios.¹⁷⁸

The prevalence of such offsetting positions explains why the net payment demanded after the Lehman auction was relatively small. The small required net payment in turn largely explains why the auction was not destabilizing. Also contributing to the auction’s muted impact, albeit to a lesser extent, was its price efficiency. In general, implied recoveries from auction settlement prices tend to closely track market expectations as expressed by bond prices preceding the auction.¹⁷⁹ To be sure, the link between the settlement price and pre-auction bond prices was smaller for Lehman than it has been for other defaulting entities since, as noted above, the Lehman auction settled several cents below pre-auction expectations conveyed by bond prices.¹⁸⁰ But relative to the fall in bond prices that had already occurred before and after LBHI’s filing, the further fall induced by the auction was quite small.



¹⁷⁸ BIS Q. REV. (June 2010), *supra* note 153, at A121 tbl.19; *see, e.g.*, ISDA CDS Marketplace, *Market Statistics: Portfolio Compression*, http://www.isdacdsmarketplace.com/market_statistics/portfolio_compression.

¹⁷⁹ *See* Helwege et al., *supra* note 162, at 13, 19 tbl.2.

¹⁸⁰ *See id.* at 19 tbl.2.

¹⁸¹ Bloomberg.

Indeed, as illustrated by Figure 1.6 (which uses the same reference bonds as Figure 1.3 above), almost the entire decline in Lehman bond prices occurred before the October 10th auction. Specifically, between early September and the day before the auction, bond prices had declined from around one hundred cents to about thirteen cents on the dollar. Against this approximately eighty-seven cent fall, the four to five cent decline following the auction appears de minimis. This fact is relevant because CDS prices reflect recoveries implied by reference bonds and CDS sellers are generally required to post collateral if their positions decline in value. Accordingly, with the bulk of the bond price decline having occurred before October 10, most of the losses that parties suffered from Lehman CDS were likely already accounted for and collateralized prior to the auction.¹⁸² In other words, the “reckoning,” which did not prove to be large in any case, had for the most part already happened.

iii. Exposure to Lehman’s OTC Derivatives

(1) Background on the OTC Derivatives Market

The CDS referencing Lehman constituted a piece of the large—and rapidly growing—OTC derivatives universe; Lehman’s positions in this universe, in CDS and other products, constituted an even larger piece and thus may have been the most significant cause of concern among market participants and regulators in the run-up to Lehman’s failure.¹⁸³ Put simply, there was a fear that if Lehman failed, its major OTC derivatives counterparties (other large financial institutions) could themselves be vulnerable to failure as they would not be able to fully recover—or recover at all—on Lehman contracts for which they were owed money (“in-the-money” contracts).¹⁸⁴

This fear proved to be overstated for a variety of reasons specific to the Lehman case that are described in subsequent subsections. It was also overblown owing to a general

¹⁸² See Harrington & Unmack, *supra* note 165.

¹⁸³ See *supra* note 147.

¹⁸⁴ In using the term “in-the-money” to denote a contract for which a party is owed money (that is, a contract that is an asset to the party and a liability in an equal amount to its counterparty), this paper is equating “in-the-money” with “positive net present value” (NPV). In market practice, however, the terms are not the same, and the more relevant measure in assessing exposure is in fact positive NPV, which refers to the total value of a derivatives contract, encompassing both intrinsic value (“moneyness”) and time value. Significantly, a derivative can be “out-of-the-money” as the term is used in market practice (meaning it has no intrinsic value) but can still have positive NPV (because it has time value). So, while “positive NPV” is therefore the technically correct term, for convenience this paper uses “in-the-money” to denote the same concept.

mischaracterization of the magnitude of the OTC derivatives market, or more precisely, how much parties stood to lose if the market collapsed. While the OTC derivatives market had experienced torrid growth in the years leading up to Lehman's failure, it did not account for as much risk as commonly believed, due to netting agreements and the difference between notional and actual market value, as discussed in the previous section.¹⁸⁵

In addition, the Bankruptcy Code's derivatives safe harbors mitigate the fallout from a default. Specifically, derivatives counterparties to a bankrupt institution can seize collateral posted prior to the default (an act that would otherwise violate the automatic stay),¹⁸⁶ including collateral posted on the eve of the institution's bankruptcy filing (an act that could otherwise violate preference rules).¹⁸⁷ While the wisdom of the Bankruptcy Code's preferential treatment for derivatives counterparties and its effect on systemic risk are much debated,¹⁸⁸ it is beyond debate that these special rules place derivatives counterparties on firmer ground than many others—both before and during bankruptcy. In doing so, the provisions might contribute to liquidity strains and bring certain institutions closer to collapse, as was the case with AIG. But whether they have this effect or not, they surely leave derivatives counterparties better protected.

Notwithstanding these mitigating factors, there was at least one reason to believe that losses following the default of a major derivatives counterparty could prove catastrophic to systemically important firms and by extension, the financial system as a whole. The OTC derivatives market was at the time of Lehman's collapse, and is to an even greater degree now (absent Bear Stearns, Lehman Brothers, and Merrill Lynch), remarkably concentrated, with a small number of institutions accounting for the vast majority of dealer holdings and activity. The Office of the Comptroller of the Currency (OCC), for example, reports that in the first quarter of 2012, just five holding companies—JPMorgan, Bank of America, Citigroup, Morgan Stanley,

¹⁸⁵ See *supra* text accompanying note 175.

¹⁸⁶ See 11 U.S.C. §§ 362(b)(17), (27), 560 (2006).

¹⁸⁷ See *id.* § 546(g), (j).

¹⁸⁸ Compare Mark J. Roe, *The Derivatives Market's Payment Priorities as Financial Crisis Accelerator*, 63 STAN. L. REV. 539, 541, 565 (2011) (suggesting that the Code's special provisions facilitated the financial crisis and increased systemic risk), and Franklin R. Edwards & Edward R. Morrison, *Derivatives and the Bankruptcy Code: Why the Special Treatment?*, 22 YALE J. ON REG. 91, 91 (2005) (arguing that the provisions might exacerbate systemic risk but might be justified on efficiency grounds), with H.R. REP. NO. 97-420, at 1 (1982) (finding that the exemption from the automatic stay was necessary to prevent the insolvency of one securities firm from threatening others and the market as a whole).

and Goldman Sachs (listed in order of size from largest to smallest)—accounted for almost 96% of the OTC derivatives notional of the top twenty-five holding companies in the United States.¹⁸⁹

Even so, the concern that the collapse of any major dealer would bring down the entire financial system was exaggerated. In the case of Lehman specifically, such a fear was particularly overblown owing to several mitigating factors that might not accompany another large institution's failure. As detailed below, these factors include the positive positioning of Lehman's derivatives portfolio (with the firm's assets exceeding its liabilities) and the frequency with which its derivatives contracts were collateralized and centrally cleared. AIG, in contrast, had a highly negatively positioned derivatives portfolio, which, unlike Lehman's portfolio, actually contributed to the firm's near collapse and was not centrally cleared at all. But as problematic as AIG's derivatives were, direct losses among counterparties would have been manageable even if the company had defaulted.

(2) Lehman's OTC Derivatives Exposure

Lehman was undoubtedly a significant player in the OTC derivatives market. As of August 31, 2008, the derivatives assets and liabilities of LBHI-controlled entities were valued at \$46.3 billion and \$24.2 billion, respectively.¹⁹⁰ Based on BIS estimates, this combined gross market value of approximately \$70.5 billion likely accounted for about 0.3% of the gross market value of all outstanding derivatives.¹⁹¹ In CDS alone, Lehman was estimated to have a portfolio of between \$3.65 trillion and \$5 trillion in total notional,¹⁹² accounting for as much as 8% of the overall CDS market's notional.¹⁹³ Moreover, across products, Lehman (primarily through LBSF)

¹⁸⁹ See OFFICE OF THE COMPTROLLER OF THE CURRENCY, OCC'S QUARTERLY REPORT ON BANK TRADING AND DERIVATIVES ACTIVITIES FIRST QUARTER 2012 tbl.2 (Mar. 31, 2012); see also OFFICE OF THE COMPTROLLER OF THE CURRENCY, OCC'S QUARTERLY REPORT ON BANK TRADING AND DERIVATIVES ACTIVITIES SECOND QUARTER 2011 tbl.2 (June 30, 2011) (also suggesting concentration of nearly 96% as of the end of the second quarter of 2011).

¹⁹⁰ 2 Examiner's Report, *supra* note 17, at 572.

¹⁹¹ This approximation is based on a time-weighted linear interpolation of BIS's reported June 2008 gross market value of \$20.4 trillion and its reported December 2008 gross market value of \$33.9 trillion. BIS Q. REV. (June 2009), *supra* note 176.

¹⁹² Sheri Markose et al., *Too Interconnected To Fail 5* (Ctr. for Computational Fin. and Econ. Agents, ECB Workshop Paper, Oct. 2009). The market value of Lehman's CDS holdings in isolation is unclear, but as of May 31, 2008, the combined net market value of its interest rate, currency, and credit derivatives portfolios was approximately \$16 billion. 2 Examiner's Report, *supra* note 17, at 572.

¹⁹³ See BIS Q. REV. (June 2010), *supra* note 153, at A121 tbl.19.

had a derivatives portfolio at the time of its bankruptcy filing consisting of over one million trades,¹⁹⁴ or perhaps around 2% of all outstanding OTC positions.¹⁹⁵

Given the size of Lehman's derivatives business, many feared that LBHI's filing would produce, in the words of PIMCO's Bill Gross, an "immediate tsunami."¹⁹⁶ To guard against such a disaster, major market participants moved to net down their Lehman exposure through a special trading session on Sunday, September 14.¹⁹⁷ But this effort was largely ineffective (by one estimate, it accounted for less than \$1 billion notional in total transactions¹⁹⁸) because, market participants suggest, some entities could not fully determine what their Lehman exposure actually was and others sought to resolve only contracts for which Lehman owed them money.¹⁹⁹

Despite the failure of this net-down session, Lehman's collapse did not produce the tidal wave of losses that had been feared. To be sure, the scope of losses still remains unclear because the magnitude of Big Bank OTC derivatives claims—claims brought by a group of about thirty major financial institutions that the estate labels "Big Banks"²⁰⁰—has been a subject of intense dispute that, while lurching toward resolution, has yet to be fully settled as of the Modified Third Amended Plan.²⁰¹ The confirmation of the Modified Third Amended Plan did, however, settle

¹⁹⁴ See ALVAREZ & MARSAL, *supra* note 133, at 20. As of June 2009, LBSF accounted for approximately 75% of Lehman's derivatives trades, 80% of its receivables (that is, the amount owed Lehman for its derivatives), and 75% of its payables (the amount Lehman owed). See *id.* at 21.

¹⁹⁵ As the overall number of outstanding trades is not a commonly reported statistic, it is difficult to precisely estimate the percentage of OTC trades that Lehman accounted for. Still, there is reason to believe that the percentage was non-negligible. The Depository Trust & Clearing Corporation (DTCC), for example, reported that it held 2.3 million CDS contracts in its Trade Information Warehouse as of April 2010. Press Release, Depository Trust & Clearing Corp., DTCC Continues Expansion of Public Data on OTC Credit Derivatives (May 6, 2010), http://www.dtcc.com/news/press/releases/2010/data_release_expanded.php. Adjusting for the roughly 50% decline in total CDS notional between June 2008 and December 2009 and assuming both that CDS accounted for about 8% of Lehman's trades (based on the percentage of overall derivatives notional that came from CDS in June 2008 as reported by the BIS) and that they did not make up a disproportionate share of Lehman's holdings, one could reasonably conclude that Lehman held about 2% of all outstanding derivatives contracts. See BIS Q. REV. (June 2010), *supra* note 153, at A121 tbl.19.

¹⁹⁶ *Derivatives Market Trades on Sunday to Cut Lehman Risk*, REUTERS, Sept. 14, 2008, <http://www.reuters.com/article/idUSN1444498020080914>.

¹⁹⁷ *Id.*

¹⁹⁸ *Id.*

¹⁹⁹ See Bob Ivry et al., *Missing Lehman Lesson of Shakeout Means Too Big Banks May Fail*, BLOOMBERG, Sept. 8, 2009, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aX8D5utKFuGA>.

²⁰⁰ See, e.g., Disclosure Statement for First Amended Plan, *supra* note 54, Exhibit 6-5; Disclosure Statement for Third Amended Plan, *supra* note 73, Exhibit 6-6.

²⁰¹ See Disclosure Statement for Revised Third Amended Plan, *supra* note 73, Exhibit 6-6 (noting that the estate had entered into settlements with eight of the Big Banks).

another issue implicating derivatives—substantive consolidation. Because most derivatives claims stem from trades facing LBSF subject to LBHI guarantees, substantive consolidation, by eliminating these guarantees, could have considerably reduced payouts for allowed derivatives claims.²⁰² Yet, in assigning only a 20% probability to substantive consolidation, the Modified Third Amended Plan has enabled derivatives creditors to retain most of the benefit of their guarantees.²⁰³

But even if the estate had been substantively consolidated, the losses borne by derivatives creditors would have still been manageable. For one thing, as explained in Part I.B.2.c.ii.(1) below, the magnitude of the asserted claims has not been overwhelming, notwithstanding the disputes that they have engendered. Explaining this result and further mitigating it have been three key factors, explored in Part I.B.2.c.ii.(2) below: Lehman’s OTC derivatives assets exceeded its derivatives liabilities, many of its derivatives liabilities were collateralized, and some of its derivatives were centrally cleared.

That direct derivatives losses were manageable should not, however, be taken to suggest that derivatives counterparties did not meaningfully suffer from Lehman’s default. While derivatives did not cause Lehman’s failure and Lehman’s failure did not in turn cause the collapse of any large derivatives counterparty,²⁰⁴ derivatives counterparties had to replace their derivatives at a time when, owing to Lehman’s collapse, derivatives markets were dislocated.²⁰⁵ Given the degree of concentration in the OTC derivatives market mentioned in Part I.A.2.b.iii.(1) the replacement cost of these derivative positions was likely to be higher the more concentrated (and less competitive) the market for that particular derivative. As discussed in Part

²⁰² Compare Disclosure Statement for Amended Ad Hoc Plan, *supra* note 69, Exhibit 2-12 (projecting a 27.2% recovery for LBSF claimants with an LBHI guarantee), with Disclosure Statement for Non-Consolidation Plan, *supra* note 65, Exhibit 4 (projecting a 41.7% recovery).

²⁰³ See Disclosure Statement for Third Amended Plan, *supra* note 73, at 59; see also *supra* text accompanying notes 70-79.

²⁰⁴ See, e.g., Kimberly Summe, *Misconceptions About Lehman Brothers’ Bankruptcy and the Role Derivatives Played*, 64 STAN. L. REV. 16, 16-18 (2011) (noting that “[t]hree primary factors drove Lehman Brothers into bankruptcy, and derivatives trading is not one of them,” and that “not one of [Lehman’s] derivatives counterparties filed for bankruptcy in the aftermath of its failure”).

²⁰⁵ See, e.g., Manmohan Singh & James Aitken, *Counterparty Risk, Impact on Collateral Flows, and Role for Central Counterparties* 5 (Int’l Monetary Fund, Working Paper No. 09/173, Aug. 2009), <http://www.imf.org/external/pubs/ft/wp/2009/wp09173.pdf> (noting that when a large financial institution fails, “[t]he cost of putting on the exact same trade can be very high”).

I.A.2.b.iii.(2).(a) below, derivatives claims are intended to incorporate such replacement costs, but replacement is not always possible, and the measurement of replacement costs can in any case be contentious.

Further, though Part I.A.2.b.iii.(2).(b) below highlights the use of collateral as a mitigating factor, buy-side participants in particular faced losses both because they did not obtain sufficient collateral from Lehman for positions that were in their favor and because they could not recover the collateral they had posted with Lehman as initial margin on OTC trades.²⁰⁶ These problems in part stemmed from the asymmetrical nature of initial margin (or, in the language of OTC derivatives, “independent amount”) requirements: whereas buy-side participants typically post initial margin to dealers, dealers generally do not post initial margin to their buy-side counterparties.²⁰⁷ Additionally, most of the initial margin that buy-side entities post to dealers is not segregated, so demands for the return of initial margin posted to Lehman did not generally receive special protection but instead amounted to unsecured claims.²⁰⁸ Not only did buy-side participants thus face the prospect of getting back only a fraction of the initial margin they had posted to Lehman, but they were also likely subject to increased margin requirements on their non-Lehman exposure owing to “the procyclical nature of practices for setting haircuts and initial margins and other credit terms for secured lending”²⁰⁹—resulting in relaxed credit terms when market conditions are strong and stringent credit terms when conditions are weak.

²⁰⁶ See Comm. on the Global Fin. Sys., *The Role of Margin Requirements and Haircuts in Procyclicality* 8 (CGFS Papers, No. 36, Mar. 2010), <http://www.bis.org/publ/cgfs36.pdf>.

²⁰⁷ See ISDA, MFA & SIFMA, *Independent Amounts* 6 (Release 2.0, Mar. 1, 2010), http://www.isda.org/c_and_a/pdf/Independent-Amount-WhitePaper-Final.pdf. For expositional ease, this paper uses the term “initial margin” to denote both initial margin and independent amount though technically, “independent amount” is the proper term for OTC derivatives while “initial margin” is used in the context of cleared derivatives. See *id.* at 5.

²⁰⁸ See *id.* at 7; ISDA MARGIN SURVEY 2012 at 12 (noting that even several years after Lehman’s collapse, more than 70% of initial margin was not segregated).

²⁰⁹ Comm. on the Global Fin. Sys., *supra* note 206, at 11; see also DAVID P. BELMONT, *MANAGING HEDGE FUND RISK AND FINANCING: ADAPTING TO A NEW ERA* 182 (2011) (noting that for hedge funds engaged in convertible bond arbitrage, prime brokers increased margin requirements from around 10% before Lehman’s collapse to up to 30% by December 2008); cf. Singh & Aitken, *supra* note 205, at 7-8 (finding “evidence of a sizable drop in global liquidity [from 2008 to 2009] from reduced rehypothecation, reduced securities lending and from sizeable hoarding of cash/cash equivalent by [large complex financial institutions]”).

Yet, as burdensome as these effects of Lehman’s default may have been on certain derivatives counterparties, it bears repeating that, for reasons described further below, they fell well short of the market’s worst fears.

(a) OTC Derivatives Claims

About \$75 billion in unique third-party OTC derivatives claims were filed against the Lehman estate,²¹⁰ with the Big Banks accounting for approximately 50% of them.²¹¹ The International Swaps and Derivatives Association (ISDA) conventions are central to understanding both the source and the magnitude of these claims because practically all of the derivatives facing Lehman were governed by a version of the ISDA Master Agreement.²¹² The two main ISDA Master Agreements—the 1992 ISDA Master Agreement and the 2002 ISDA Master Agreement—each classify bankruptcy as an event of default²¹³ and provide that upon an event of default, the non-defaulting party has the right to terminate all transactions under the agreement.²¹⁴ Notably, although the Bankruptcy Code generally disregards such ipso facto clauses and thus does not permit the termination of executory contracts on account of a bankruptcy filing,²¹⁵ the Bankruptcy Code’s “safe harbor” provisions exempt swap agreements and other important derivatives from both this rule and the automatic stay as a whole.²¹⁶ So early termination under a Master Agreement is usually valid, and parties can seize any collateral posted pursuant to the agreement—an act that would otherwise violate the stay.²¹⁷ Accordingly,

²¹⁰ As noted in Section I.B.1, the Initial Plan suggested that about \$74 billion in third-party derivatives claims were brought against LBHI on account of its guarantees of affiliates, and approximately the same amount of claims was brought against the affiliates directly. *See* Disclosure Statement for Initial Plan, *supra* note 15, Annex A-2, A-3; *see supra* note 116.

²¹¹ *See* ALVAREZ & MARSAL, LEHMAN BROTHERS HOLDINGS INC.: PLAN STATUS REPORT 16 (Jan. 13, 2011) (noting that, before the 50% adjustment in the Amended Plan described below, Big Banks accounted for 48% of about \$45 billion in then-extant claims).

²¹² *See* Disclosure Statement for Initial Plan, *supra* note 15, Annex A-2.

²¹³ Int’l Swaps and Derivatives Ass’n, 1992 Master Agreement (Multi-Currency–Cross Border) § 5(a)(vii) [hereinafter ISDA, 1992 Master Agreement]; Int’l Swaps and Derivatives Ass’n, 2002 Master Agreement § 5(a)(vii) [hereinafter ISDA, 2002 Master Agreement].

²¹⁴ Agreements may provide for “Automatic Early Termination,” in which case the non-defaulting party has to terminate upon an event of default. ISDA, 1992 Master Agreement, *supra* note 213, § 6(a); ISDA, 2002 Master Agreement, *supra* note 213, § 6(a).

²¹⁵ 11 U.S.C. § 365(e)(1) (2006).

²¹⁶ *See, e.g., id.* §§ 362(b) (exempting derivatives from the automatic stay), 560, 561.

²¹⁷ *See id.* § 362(a) (prohibiting, *inter alia*, “any act to...enforce any lien against property of the estate”).

the vast majority of Lehman trades had been terminated by January 2009,²¹⁸ with the gross derivatives assets and liabilities of LBHI-controlled entities falling to about \$26 billion by June 2009.²¹⁹

Those counterparties who terminated their derivatives contracts or otherwise had grounds for a derivatives claim against the estate were required to file a special Derivative Questionnaire by October 22, 2009.²²⁰ The questionnaire instructed claimants to provide a valuation statement for any collateral,²²¹ specify any unpaid amounts,²²² and most significantly, supply their derivatives valuation methodology and supporting quotations.²²³ All of these inputs are necessary under the ISDA framework because the amount owed to a non-defaulting party on account of default is equal to the net value of the derivatives under the Master Agreement (per the selected valuation methodology) plus any unpaid amounts offset by any collateral that has been posted against the contracts (or increased by any collateral that the non-defaulting party has posted).²²⁴ To the extent that a non-defaulting party is owed more than the defaulting party has posted in collateral, it becomes an unsecured creditor to the estate. Through this framework, the Master Agreement attempts to enable the non-defaulting party to assert a claim for an amount that, if fully recovered, would place it in the same position absent the default.

The precise way in which it does so depends on the valuation methodology chosen, but the differences among methodologies are not as significant as they may appear. Upon entering into a version of the 1992 Master Agreement, parties can choose between either the Market Quotation method or the Loss method.²²⁵ The former method entitles the non-defaulting party to

²¹⁸ See ALVAREZ & MARSAL, LEHMAN BROTHERS HOLDINGS INC.: § 341 MEETING 19-20 (Jan. 29, 2009) (reporting that as of January 2, 2009, 888,000 of 906,000 trades had been terminated); see also Notice of Debtors' Motion for an Order Pursuant to Sections 105 and 365 of the Bankruptcy Code To Establish Procedures for the Settlement or Assumption and Assignment of Prepetition Derivative Contracts at 4, *In re Lehman Bros. Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Nov. 13, 2008) (indicating that as of November 13, 2008, approximately 733,000 contracts had been terminated).

²¹⁹ See Disclosure Statement for Initial Plan, *supra* note 15, at 275.

²²⁰ See Notice of Deadlines for Filing Proofs of Claim 4-5, *In re Lehman Brothers Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. July 8, 2009).

²²¹ Lehman Brothers Derivative Questionnaire § 4(c).

²²² *Id.* § 4(f).

²²³ *Id.* § 4(e).

²²⁴ See ISDA, 1992 Master Agreement, *supra* note 213, § 6(e); ISDA, 2002 Master Agreement, *supra* note 213, § 6(e).

²²⁵ See ISDA, 1992 Master Agreement, *supra* note 213, § 6(e)(i)(1)-(2).

a settlement amount reflecting net unpaid amounts owed to the party and market quotations from at least three reference market-makers for replacement transactions;²²⁶ the latter method entitles the non-defaulting party to “an amount that party reasonably determines in good faith to be its total losses” from the terminated transactions.²²⁷ The 2002 Master Agreement employs the Close-out Amount approach, which, like the Market Quotation method, entitles the non-defaulting party to any unpaid amounts as well as a “Close-out Amount” which represents the costs “that are or would be realized under then prevailing circumstances in replacing [] or in providing...the economic equivalent of” the terminated trades.”²²⁸ Like the Loss method, the Close-out Amount Approach allows the determining party to “use [any] commercially reasonable procedures in order to produce a commercially reasonable result.”²²⁹

The above approaches share two important features that help explain the magnitude of derivatives claims and the contentiousness surrounding them in the Lehman case. First, both the Market Quotation and Close-out Amount methods and, to a lesser extent, the Loss method premise claims primarily on replacement costs—that is, the value that the non-defaulting party would need to pay or receive to enter into an economically equivalent position. Notably, this amount is likely to depart from fair market value as parties generally must pay an amount above fair market value when they buy (paying the offer price to dealers) and receive an amount below fair market value when they sell (receiving the bid price from dealers). In markets where the bid-offer spread is high, as can be expected following the default of a major counterparty, there can therefore be a considerable difference between what a non-defaulting party would have to pay or receive to re-establish a position and what the position is truly worth. Thus, it is not surprising that the Lehman estate has cited “abnormally wide bid-offer spreads and extreme liquidity adjustments resulting from irregular market conditions” as core challenges in the claims and recovery process.²³⁰

An additional challenge that arises from all valuation methods is that calculating replacement costs appears to be as much an art as a science. For one thing, to assert a claim

²²⁶ See *id.* §§ 6(e)(i)(1), 12.

²²⁷ See *id.* §§ 6(e)(i)(2), 12.

²²⁸ See ISDA, 2002 Master Agreement, *supra* note 213, § 6(e)(i). *Id.* § 14.

²²⁹ *Id.* § 14.

²³⁰ Disclosure Statement for Initial Plan, *supra* note 15, at 62.

based on replacement costs, the non-defaulting party need not actually enter into a replacement position. Indeed, in the Lehman case, few contracts seem to have been substituted in a manner replicating the exact terms of the trades,²³¹ and it is unclear to what extent their economic substance was actually replaced. As a result, replacement costs need not—and in the Lehman case, likely did not—track actual costs. Instead, particularly under the Close-out Amount and Loss approaches, the non-defaulting party may have considerable leeway in arriving at estimates for replacement costs provided that these figures are “commercially reasonable.” And even under the Market Quotation approach, where ostensibly the non-defaulting party has to rely on third-party quotations, judgment is likely to come into play because the non-defaulting party must resort to the less restrictive Loss method when quotations either cannot be determined or are not commercially reasonable. As suggested above, following Lehman’s default, bid-offer spreads and illiquidity increased considerably such that non-defaulting parties may not have been able to obtain the requisite three quotations for certain contracts, or the quotations that they received may not have been reasonable.

The inexact nature of the derivatives claims and valuation process has fueled considerable contentiousness among Lehman and the Big Banks. Believing that the Big Banks have exaggerated the extent of the damage they suffered, the Lehman estate reduced estimated allowable Big Bank derivatives claims by over \$23 billion in the Modified Third Amended Plan.²³² At the same time, the estate has been working with the Big Banks to arrive at a mutually agreeable settlement. Thus, in May 2011, it proposed a derivatives claims settlement framework to thirteen of the largest Big Banks “with the intent of creating a standardized, uniform and transparent methodology to fix unresolved Derivative Claims...of the Big Bank Counterparties.”²³³ This framework calls for derivatives contracts facing Lehman to be valued at mid-market as of a specific valuation date (between September 15 and September 19, 2008) and then, for an “additional charge” to be added based on product-specific grids that generally adjust

²³¹ See, e.g., Proof of Claim, Goldman Sachs Bank USA, Claim No. 28103, at 4, *In re Lehman Brothers Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Sept. 22, 2009) (noting that “instances of exact replacement trades were few”).

²³² See Disclosure Statement for Third Amended Plan, *supra* note 73, Exhibit 6-6 (noting a reduction in direct Big Bank claims from \$22 billion to \$10.3 billion and a similar reduction in guarantee claims).

²³³ Derivatives Claims Settlement Framework 4, *In re Lehman Brothers Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. May 27, 2011) [hereinafter Derivatives Framework].

for the maturity and risk of the contracts.²³⁴ However, if the Big Banks can prove that they entered into economically identical and commercially reasonable replacement trades on the date of LBHI's filing, they can use the value of these trades instead of the methodology that the settlement framework generally calls for.²³⁵

The estate's framework has been relatively successful thus far. Specifically, after increasing its proposed settlement values by 11.25%, the estate reached resolutions with eight of the thirteen Big Banks to which it offered the framework.²³⁶ Through these settlements, it reduced approximately \$19.2 billion in derivatives claims (about 44% of those at issue) to about \$12.4 billion.²³⁷ If one extrapolates this set of resolutions to the entire pool of Big Bank derivatives claims, the approximately \$44 billion in derivatives claims would be reduced to \$28 billion. As half of these claims were guarantee claims, this extrapolation would imply underlying derivatives exposure of only \$14 billion in contrast to the \$22 billion that the Big Banks have asserted.

But even if Big Banks do have \$22 billion in direct derivatives exposure, their derivatives losses will still be manageable—which is the core conclusion of this subsection. After all, if the Big Banks had written all of their exposure down to zero in 2008, they would have recorded at most \$22 billion in losses, quite small compared to the \$1.8 trillion of total losses incurred by financial institutions during the credit crisis²³⁸ and, more significantly, compared to the amount of capital that they held. At the end of 2008, Bank of America, Citigroup, Goldman Sachs, JPMorgan, and Morgan Stanley—then and now the five institutions with the largest OTC

²³⁴ See *id.* at 9-11, 13. The thirteen Big Banks include Bank of America, Barclays, BNP Paribas, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs, J.P. Morgan, Merrill Lynch, Morgan Stanley, the Royal Bank of Scotland, Société Générale, and UBS. *Id.* Appendix 3.3.

²³⁵ See *id.* at 12.

²³⁶ See Disclosure Statement for Third Amended Plan, *supra* note 73, at 51.

²³⁷ See *id.*

²³⁸ Writedowns & Credit Losses vs. Capital Raised, Chart View 10/01/07—3/31/10, BLOOMBERG (last accessed Oct. 17, 2010).

derivatives portfolios in the United States²³⁹—held over \$530 billion in Tier 1 capital.²⁴⁰ Even Morgan Stanley, the smallest institution among this group, held nearly \$50 billion in Tier 1 capital,²⁴¹ and no bank individually has sought anything close to that figure for derivatives facing Lehman—the largest claims from a single firm amount to just over \$2.5 billion.²⁴²

(b) Mitigating Factors

Notwithstanding the Lehman estate’s belief that derivatives claims are exaggerated, even at their possibly exaggerated level of \$75 billion they are much smaller than had been feared. Why is this the case? Three factors are important. First, Lehman had more derivatives assets than liabilities (a fact that also positively impacts expected recoveries). Second, many of its liabilities were collateralized. Third, some of the OTC trades producing these liabilities were centrally cleared by clearing houses that managed Lehman’s default without loss to market participants.

As to the first factor, entering bankruptcy, Lehman was owed more by its derivatives counterparties than it owed. As of August 31, 2008, the firm’s stated derivatives assets exceeded its liabilities by \$22.2 billion.²⁴³ Moreover, consistent with its pre-bankruptcy status, the Lehman’s derivatives book has been a positive source of cash during bankruptcy. Although the estate has encountered difficulty monetizing certain transactions,²⁴⁴ it had already collected \$12.2 billion in cash through the end of 2010 and expects to collect another \$5.2 billion,

²³⁹ See OFFICE OF THE COMPTROLLER OF THE CURRENCY, *supra* note 189; OFFICE OF THE COMPTROLLER OF THE CURRENCY, OCC’S QUARTERLY REPORT ON BANK TRADING AND DERIVATIVES ACTIVITIES FIRST QUARTER 2009 tbl.2 (Mar. 31, 2009). Goldman Sachs and Morgan Stanley did not appear in the OCC’s holding company data for the fourth quarter of 2008 because their filings as holding companies had not been made publicly available in time for the report. However, given the considerable gap between them and the sixth largest holding company in the report for the first quarter of 2009, it can be assumed that they were among the top five derivatives holders in the fourth quarter of 2008.

²⁴⁰ See BD. OF GOVERNORS OF THE FED. RESERVE SYS., THE SUPERVISORY CAPITAL ASSESSMENT PROGRAM: OVERVIEW OF RESULTS 9 (May 7, 2009).

²⁴¹ *Id.*

²⁴² Merrill Lynch, through Merrill Lynch International and Merrill Lynch Capital Services Inc., filed claims for a combined \$2.523 billion. Goldman Sachs, through Goldman Sachs Bank USA and Goldman Sachs International, filed claims for a combined \$2.519 billion. See Proof of Claim, Merrill Lynch Int’l, Claim No. 20149, *In re Lehman Bros. Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Sept. 21, 2009); Proof of Claim, Merrill Lynch Capital Servs. Inc., Claim No. 20148, *In re Lehman Bros. Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Sept. 21, 2009); Goldman Sachs Bank USA, *supra* note 231, at 5; Proof of Claim, Goldman Sachs Int’l, Claim No. 28105, at 5, *In re Lehman Bros. Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Sept. 22, 2009).

²⁴³ See 2 Examiner’s Report, *supra* note 17, at 572.

²⁴⁴ See, e.g., Disclosure Statement for First Amended Plan, *supra* note 54, at 53 (noting that “the Debtors often are unable to agree with counterparties on the amount due to the Debtors in connection with the Debtors’ ‘in the money’ Derivative Contracts and in collecting such amounts”).

primarily through settlements with counterparties.²⁴⁵ In short, Lehman made money from its derivatives trades.

These results actually represent positive developments for derivatives counterparties—and the financial system more generally—for two reasons. Most basically, the losses borne by any derivatives counterparty from Lehman’s default were in effect reduced by the extent of the party’s derivatives liabilities. So, if Lehman’s derivatives liabilities had exceeded its assets such that Lehman on net owed its counterparties money, one might expect derivatives claims to have been considerably larger and perhaps, the firm’s bankruptcy filing significantly more destabilizing. Additionally, even net in-the-money parties with minimal liabilities ultimately stand to benefit from the success of the Lehman estate in collecting cash, for the more assets the estate collects, the more that it will be able to pay out under the plan.

Despite the overall positioning of the estate, it remains true that some counterparties did have an in-the-money portfolio against Lehman. Even so, one would still not expect most large financial institutions to have reported sizable losses from Lehman derivatives exposure because the vast majority of these parties had entered into Credit Support Annexes (CSAs) with Lehman that required the out-of-the-money party to post collateral based on mark-to-market liability.²⁴⁶ Indeed, among Lehman’s top twenty-five counterparties by number of derivatives transactions, all but one were subject to a CSA.²⁴⁷ Although these agreements may not have insulated parties from “gap risk”—that is, the risk that mark-to-market dramatically changes between collateral postings—they certainly should have greatly mitigated the effects of a default if counterparties exercised their rights under these agreements. The evidence suggests that they did.

For example, JPMorgan, one of Lehman’s largest derivatives counterparties,²⁴⁸ has sought a comparatively negligible amount of damages for derivatives exposure mainly because the bank applied nearly \$1.6 billion in cash collateral posted by LBHI against the roughly \$2.2

²⁴⁵ See Disclosure Statement for Third Amended Plan, *supra* note 73, at 34; ALVAREZ & MARSAL, *supra* note 96, at 13.

²⁴⁶ See 2 Examiner’s Report, *supra* note 17, at 574.

²⁴⁷ *Id.* at 575.

²⁴⁸ Henny Sender, *Lehman Creditors in Fight to Recover Collateral*, FIN. TIMES, June 21, 2009, <http://www.ft.com/cms/s/0/909ba63c-5e99-11de-91ad-00144feabdc0.html> (noting that J.P. Morgan was Lehman’s largest counterparty); 2 Examiner’s Report, *supra* note 17, at 573 (reporting that Lehman’s largest counterparties by deal count as of May 2008 were, in order of their size, Deutsche Bank, J.P. Morgan, and UBS).

billion owed to its main derivatives affiliate.²⁴⁹ It is true that JPMorgan's experience may not be entirely representative of other counterparties' because the bank also served as Lehman's principal clearing agent. Most significantly, JPMorgan provided tri-party repo clearing services, functioning as an intermediary between Lehman and the institutions supplying the investment bank with the repo funding that it used to finance its daily operations.²⁵⁰ In this clearing role, JPMorgan held collateral that Lehman posted to obtain repo financing and provided Lehman with intraday cash advances to be repaid with funds that Lehman received from tri-party investors.²⁵¹ Lehman thus may have faced greater pressures to submit collateral to JPMorgan than to other derivatives counterparties. These pressures may have been particularly strong in Lehman's final weeks as JPMorgan obtained added protection by executing amended clearing, security, and guaranty agreements with Lehman in both August and, more controversially, September 2008.²⁵²

Whether or not JPMorgan's amended September agreements were invalid²⁵³ and its final collateral requests on account of its amended agreements were excessive, in bad faith, and fatal to Lehman, as the Lehman estate alleges,²⁵⁴ it is important to emphasize that JPMorgan and other large Lehman counterparties had put in place protections well before the filing. The prevalence of such protections, in the form of CSAs, suggests that even if Lehman's portfolio had not been as in-the-money as it proved to be, the fallout from its failure would have still proven manageable for OTC derivatives counterparties. In other words, large derivatives counterparties did not escape calamity from Lehman's collapse merely because Lehman fortuitously held a net in-the-money derivatives portfolio. They escaped because of standard collateral arrangements,

²⁴⁹ See Proof of Claim, J.P. Morgan, Claim No. 27189, at 9-10, 12, *In re Lehman Bros. Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Sept. 22, 2009).

²⁵⁰ See 4 Examiner's Report, *supra* note 17, at 1068.

²⁵¹ See *id.* at 1119.

²⁵² See *id.* at 1115-16 (explaining the August agreements), 1152-54 (outlining the September agreements).

²⁵³ The Examiner concluded that they were not invalid because it did not find evidence of either economic duress or lack of consideration, and it failed to find a colorable claim that the agreements were invalid for lack of authority. *Id.* at 1173 (duress), 1183 (consideration), 1186 (authority).

²⁵⁴ During the weeks preceding its filing, LBHI delivered to J.P. Morgan \$8.6 billion in collateral, most of which related to clearing, not derivatives, exposure. Alleging that this series of transfers squeezed LBHI's liquidity, the Lehman estate has since brought suit against J.P. Morgan for excessive collateral requests. See Mike Spector & Susanne Craig, *Lehman's Bankruptcy Estate Sues J.P. Morgan*, WALL ST. J., May 27, 2010, http://online.wsj.com/article/NA_WSJ_PUB:SB10001424052748704032704575268843657457202.html. Although the Examiner found that the estate had a colorable claim against J.P. Morgan for the demand of excessive collateral, it concluded that the claim was weak. 4 Examiner's Report, *supra* note 17, at 1210.

which by 2007, covered 59% of all derivatives transactions and an even higher percentage of such transactions among large, systemically important firms.²⁵⁵

Large counterparties were also helped by clearing arrangements. Indeed, though the preceding two factors apply to Lehman's OTC derivatives in general (both cleared and uncleared), the management of Lehman's cleared OTC derivatives was particularly seamless. The exact percentage of Lehman's OTC derivatives that were cleared is difficult to determine, yet it seems that a large portion of its interest rate derivatives but almost none of its credit derivatives were cleared.²⁵⁶ Across products that were cleared, "[t]he comprehensive responses by [central counterparty clearing houses] enabled the vast majority of Lehman Brothers' proprietary and client positions to be settled as expected, with no substantial losses to central counterparties."²⁵⁷ For example, LCH.Clearnet managed the default of Lehman's interest rate swap portfolio, consisting of 66,000 trades and \$9 trillion in notional value, within three weeks and without loss to other market participants.²⁵⁸ According to the Bank of England, in doing so, LCH.Clearnet "illustrate[d] the ability of a clearing house to protect market participants from bilateral counterparty risk, even in the event of default of a major participant."²⁵⁹

In addition to directly protecting counterparties from Lehman's default and thus mitigating interconnectedness problems, clearing houses may have also helped mitigate contagion problems by reducing systemic risk across the OTC derivatives universe. While

²⁵⁵ See INT'L SWAPS & DERIVATIVES ASSOC., ISDA MARGIN SURVEY 2007, at 4, http://www.isda.org/c_and_a/pdf/ISDA-Margin-Survey-2007.pdf; see also Summe, *supra* note 204, at 20 (arguing that insufficient collateralization of derivatives was, contrary to popular belief, not a problem for Lehman counterparties).

²⁵⁶ See INT'L MONETARY FUND, GLOBAL FINANCIAL STABILITY REPORT 9 (Apr. 2010) (suggesting that central clearing of Lehman's credit derivatives might have reduced the fallout from its failure); *Managing the Lehman Brothers' Default*, LCH.CLEARNET, http://www.lchclearnet.com/swaps/swapclear_for_clearing_members/managing_the_lehman_brothers_default.asp (last visited Mar. 15, 2012) (noting that \$9 trillion notional of Lehman's interest rate swaps were successfully cleared by LCH.Clearnet); see also Darrell Duffie, Ada Li & Theo Lubke, *Policy Perspectives on OTC Derivatives Market Infrastructure* 11-12 (MFI Working Paper Series, No. 2010-002, Jan. 2010), <http://mfi.uchicago.edu/publications/papers/policy-perspectives-on-otc-derivatives-market-infrastructure.pdf> (suggesting that by the end of 2009, about 35% of all interest rate derivatives were centrally cleared).

²⁵⁷ CCP12, *Central Counterparty Default Management and the Collapse of Lehman Brothers* 1 (Apr. 2009), <https://files.pbworks.com/download/LmG4PB9Ubl/ccp12/32997239/CCP%20Default%20Management%20and%20the%20Collapse%20of%20Lehman%20Brothers.pdf>.

²⁵⁸ *Managing the Lehman Brothers' Default*, *supra* note 256.

²⁵⁹ BANK OF ENGLAND, FINANCIAL STABILITY REPORT 20 (Oct. 2008), <http://www.bankofengland.co.uk/publications/Documents/fsr/2008/fsrfull0810.pdf>.

contagion is not a focus of this part of the paper, it is worth noting that, as Acharya and Bisin (2010) conclude, the opacity of the OTC markets might lead to excessive, inefficient risk-sharing that can be remedied by the transparency of OTC clearing houses in a manner that reduces the probability of default.²⁶⁰ Further, when default seems likely, Duffie, Li, and Lubke (2010) find that “[clearing houses]...lower the systemic risk associated with runs by derivatives counterparties” both since “[their] contractual obligations to [their] clearing participants prevent [these participants] from novating or terminating positions”²⁶¹ and since, as Duffie (2010) separately notes, the guarantees that they provide reduce the incentives for counterparties to run.²⁶² Runs are potentially destructive not only because they might hasten a large dealer’s demise but also because, before and after a default, they might foment general market instability. Thus, one might argue that even if OTC derivatives did not lead to Lehman’s failure and caused only limited interconnectedness problems in the wake of the failure, more pervasive central clearing might have still been beneficial to market participants.

(3) AIG

AIG provides an important comparison to Lehman that is considered here because it is widely believed that whatever the situation with Lehman, AIG was saved because of the interconnectedness of its derivative positions with other important financial institutions. While it is relatively clear that derivatives helped to bring down AIG, there is no substantial evidence that its failure would have put its counterparties at risk of insolvency. Direct losses from in-the-money CDS positions held by counterparties would have been small relative to their capital. Indeed, as Treasury Secretary Geithner has stated, “The risk to the system from AIG’s collapse is *not* particularly reflected in the direct effects on its major counterparties, the banks that bought protection from AIG.”²⁶³ Rather, as with Lehman, the more significant concern emanating from the potential failure of AIG related to the drying up of short term funding markets through the spread of contagion.

²⁶⁰ See Viral Acharya & Alberto Bisin, *Counterparty Risk Externality: Centralized Versus Over-the-Counter Markets* 37 (June 2010), http://econ.as.nyu.edu/docs/IO/17314/Acharya_20100910.pdf.

²⁶¹ Duffie, Li & Lubke, *supra* note 149, at 11.

²⁶² See Duffie, *supra* note 149, at 67.

²⁶³ CONG. OVERSIGHT PANEL, JUNE OVERSIGHT REPORT: THE AIG RESCUE, ITS IMPACT ON MARKETS, AND THE GOVERNMENT’S EXIT STRATEGY 131 (June 10, 2010) (emphasis added) [hereinafter COP AIG REPORT].

In stark contrast to Lehman, the government offered considerable support to AIG—ultimately as much as \$182 billion, according to the Congressional Oversight Panel.²⁶⁴ The support started the day after LBHI’s filing, when the Federal Reserve Board of Governors exercised its emergency powers under § 13(3) of the Federal Reserve Act²⁶⁵ to authorize the Federal Reserve Bank of New York to establish a secured credit facility of up to \$85 billion in return for a 79.9% preferred stock stake in AIG.²⁶⁶ Further, on October 8, 2008, the Board of Governors used its emergency § 13(3) powers to supply AIG with up to an additional \$37.8 billion of liquidity secured by investment-grade fixed-income securities.²⁶⁷ This was followed on November 10 by the Treasury’s purchase of \$40 billion of AIG preferred shares under the TARP as well as the establishment under § 13(3) of two additional Fed lending facilities totaling up to \$52.5 billion for two portfolios of mortgage-related securities.²⁶⁸

(a) Derivatives

As the preceding subsections suggest, the fear that OTC derivatives would create significant interconnectedness problems in the aftermath of Lehman’s collapse was unwarranted for reasons related to the OTC market as a whole (Part I.B.2.c.i) and the particulars of Lehman’s portfolio (Part I.B.2.c.ii). This does not, however, mean that OTC derivatives can never become problematic. To the contrary, AIG’s experience illustrates that derivatives portfolios can contribute to collapses. But though AIG’s derivatives were a source of the firm’s own problems and may have been a significant factor in the government’s bailout decision, it was quite unlikely that a default on their positions would have directly caused destabilizing losses or capital shortfalls for other parties. That the failure of perhaps the derivatives markets’ riskiest

²⁶⁴ FCIC REPORT, *supra* note 26, at 350.

²⁶⁵ 12 U.S.C. § 343 (2006) (providing that “[i]n unusual and exigent circumstances, the Board of Governors of the Federal Reserve System...may authorize any Federal reserve bank...to discount for any participant in any program or facility with broad-based eligibility, notes, drafts, and bills of exchange when such notes, drafts, and bills of exchange are indorsed or otherwise secured to the satisfaction of the Federal Reserve bank”).

²⁶⁶ See Press Release, Bd. of Governors of the Fed. Reserve Sys. (Sept. 16, 2008), <http://www.federalreserve.gov/newsevents/press/other/20080916a.htm>.

²⁶⁷ See Press Release, Bd. of Governors of the Fed. Reserve Sys. (Oct. 8, 2008), <http://www.federalreserve.gov/newsevents/press/other/20081008a.htm>.

²⁶⁸ See Press Release, Bd. of Governors of the Fed. Reserve Sys. (Nov. 10, 2008), <http://www.federalreserve.gov/newsevents/press/other/20081110a.htm>.

participant—which “had made the gross error of taking only one side of CDS transactions”²⁶⁹— would likely not have imperiled other major financial institutions underscores the fact that derivatives interconnectedness was far less problematic than feared.

Figure 1.7: AIG’s CDS Portfolio²⁷⁰
\$ billions

Type of CDS	Notional of CDS Written (End of 2007)	Cumulative Unrealized Losses (2007 and 2008)
Regulatory Capital		
Corporate Loans	\$229.3	\$0
Prime Residential Mortgages	149.4	0
Total Regulatory Capital	378.7	0
Arbitrage		
Multi-Sector CDOs	78.2	36.9
Corporate Debt/CLOs	70.4	2.6
Total Arbitrage	148.6	39.5
Total super-senior	527.3	39.5
Non-super-senior (Mezzanine tranches)	5.8	0.2
Total CDS	\$533.1	\$39.7

Figure 1.7 summarizes AIG’s CDS portfolio, which was at the root of the concerns over the company’s derivatives holdings. Specifically, having leveraged AIG’s credit rating to sell credit protection on ostensibly low-risk exposure,²⁷¹ AIG Financial Products (AIGFP) had amassed a \$527 billion notional CDS portfolio insuring “super-senior” risk—a layer of credit risk senior to AAA.²⁷² This super-senior CDS portfolio consisted of credit derivatives on corporate loans (\$230 billion notional), prime residential mortgages (\$149 billion notional), corporate debt and collateralized loan obligations (CLOs) (\$70 billion notional), and multi-sector collateralized debt obligations (CDOs) (\$78 billion notional).²⁷³ Additionally, AIGFP sold CDS

²⁶⁹ Wallison, *supra* note 148, at 6 (going on to emphasize that AIG’s activities should not be grounds for regulating CDS as such a response would be “like regulating all lending because one lender made imprudent loans”).

²⁷⁰ See AM. INT’L GRP., 2008 ANNUAL REPORT (FORM 10-K) 130-31 (2008) [hereinafter AIG 2008 ANNUAL REPORT].

²⁷¹ See AMERICAN INTERNATIONAL GROUP, 2007 ANNUAL REPORT (FORM 10-K) 121 (2007) [hereinafter AIG 2007 ANNUAL REPORT]; FCIC REPORT, *supra* note 26, at 139-40.

²⁷² See AIG 2008 ANNUAL REPORT, *supra* note 270, at 130-31.

²⁷³ AIG 2007 ANNUAL REPORT, *supra* note 271, at 122.

on less senior tranches, but, as Figure 1.7 illustrates, this portfolio was relatively inconsequential.²⁷⁴

Figure 1.7 further reveals that AIG's CDS losses stemmed almost entirely from its CDS on multi-sector CDOs—CDOs backed by a combination of other CDOs, commercial mortgage-backed securities, and prime, Alt-A, and subprime residential mortgage-backed securities.²⁷⁵ While the CDS on these CDOs accounted for only about 15% of AIG's super-senior portfolio by notional, they contributed to more than 93% of the firm's super-senior losses from 2007 to 2008 as \$61.4 billion of these CDS were exposed to U.S. subprime mortgages.²⁷⁶ In contrast, the assets underlying AIG's other super-senior CDS were less problematic.

That AIG suffered large losses from its CDS on multi-sector CDOs meant that its counterparties on these derivatives could be exposed in the event that AIG defaulted. Yet counterparty losses from this exposure were manageable for three reasons. First, some of this exposure was collateralized. AIG's multi-sector CDS portfolio accounted for about 96% of the \$13.8 billion in collateral that the firm had posted as of June 2008,²⁷⁷ and as Figure 1.8 illustrates below, at least about \$5 billion more collateral had been posted by the time of the bailout. To be sure, after AIG's long-term debt was downgraded by each of the three rating agencies on the date of LBHI's filing, AIG did not have enough liquidity to meet further collateral demands. Indeed, the downgrades coupled with subsequent market movements caused AIG's collateral posting obligations to soar to more than \$32 billion over the following fifteen days,²⁷⁸ compared to only about \$9 billion of cash entering the week.²⁷⁹

That AIG's potential inability to meet collateral demands was the proximate cause of its bailout suggests that counterparties might have been so significantly undersecured as to threaten their solvency had AIG defaulted. But losses from any collateral shortfalls might have been partially mitigated by counterparties' own hedging activities. For example, Goldman Sachs,

²⁷⁴ See AIG 2008 ANNUAL REPORT, *supra* note 270, at 130-31.

²⁷⁵ See, e.g., *id.* at 139 (breaking down AIG's multi-sector CDO portfolio by underlying collateral, credit rating, and vintage).

²⁷⁶ AIG 2007 ANNUAL REPORT, *supra* note 271, at 122.

²⁷⁷ See AIG 2008 ANNUAL REPORT, *supra* note 270, at 146.

²⁷⁸ See *id.* at 4.

²⁷⁹ See FCIC REPORT, *supra* note 26, at 344.

AIG's second largest counterparty, attests that it was not exposed to AIG's credit risk at all because it bought CDS on AIG in an amount that covered what it perceived to be its uncollateralized exposure on the CDS that it had purchased from AIG.²⁸⁰

Figure 1.8: Maximum Losses on Multi-Sector CDS Relative to Equity²⁸¹
\$ billions

Firm	Exposure to Maiden Lane III Portfolio	Collateral Posted Prior to Bailout	Max. Possible Loss	Shareholders' Equity (Q2 2008)	Max. Possible Loss as % of Shareholders' Equity
Société Générale	\$16.5	\$5.5	\$11.0	\$56.1	19.6%
Goldman Sachs	14.0	5.9	8.1	44.8	18.1%
Deutsche Bank	8.5	3.1	5.4	50.3	10.7%
Merrill Lynch	6.2	1.3	4.9	42.2	11.6%
Calyon	4.3	2.0	2.3	56.9	4.0%
UBS	3.8	0.5	3.3	42.2	7.8%
Ten other banks	8.8	0.2	8.6		
Total	\$62.1	\$18.5	\$43.6		

Even in the absence of the preceding factor, losses from multi-sector exposure still likely would have been manageable because the notional of the portfolio was relatively small and risk was spread across a number of firms. Underscoring these points is Figure 1.8 above, which is based on exposure to the \$62.1 billion in multi-sector CDS that AIG fully honored in its Maiden Lane III transaction. The figure suggests that in the extremely unlikely event that counterparties suffered losses equal to the notional of their CDS less any collateral posted prior to the government bailout, no firm would have faced losses of more than one-fifth of its equity. Further, the firms would still have likely remained above capital adequacy thresholds after bearing these maximum possible losses. In fact, based on its reported 14.2% total capital ratio at the end of the second quarter of 2008,²⁸² even Goldman Sachs—whose exposure-to-equity ratio

²⁸⁰ See *id.* at 376; COP AIG REPORT, *supra* note 263, at 145-47.

²⁸¹ See COP AIG REPORT, *supra* note 263, at 76; FCIC REPORT, *supra* note 26, at 376-77. For shareholders' equity information, see Crédit Agricole, *Financial Review at 30 June 2008*, <http://www.credit-agricole.com/en/Finance-and-Shareholders/Financial-reporting/Credit-Agricole-S.A.-financial-results>; Deutsche Bank, *Interim Report as of June 30, 2008*, http://www.db.com/ir/en/download/Interim_Report_2Q2008.pdf; Goldman Sachs, *Goldman Sachs Reports Second Quarter Earnings per Common Share of \$4.58*, June 17, 2008, <http://www2.goldmansachs.com/our-firm/press/press-releases/archived/2008/pdfs/2008-q2-earnings.pdf>; Merrill Lynch, *Merrill Lynch Reports Second Quarter 2008 Net Loss from Continuing Operations of \$4.6 Billion*, July 17, 2008, <http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9MTY1MzB8Q2hpbGRJRD0tMXxUeXBIPtM=&t=1>; Société Générale, *Second Quarter 2008 Press Release*, Aug. 5, 2008; UBS, *Second Quarter 2008*, Aug. 12, 2008, http://www.ubs.com/1/e/investors/quarterly_reporting/2008.html?template=layer&selected=139333.

²⁸² GOLDMAN SACHS, 2008 QUARTERLY REPORT (FORM 10-Q) 90 (May 30, 2008).

was the highest among the firms listed in Figure 1.8—would have exceeded the 8% Basel II total capital minimum if it had absorbed the maximum possible loss.²⁸³

On account of a large portion of the remaining CDS that AIG had written, there was concern that counterparties would have to raise equity upon AIG's default because they would lose the regulatory capital relief that the CDS had provided them. AIG's combined \$379 billion notional of CDS on corporate loans and prime residential mortgages had been sold to provide such relief primarily to European banks subject to Basel I.²⁸⁴ Under Basel I, counterparties could use CDS to reduce the amount of capital required to be set aside against loans from as much as 8% (if the underlying loans had a 100% risk weighting) to 1.6%.²⁸⁵ Under Basel II, in contrast, CDS generally provided no additional regulatory capital benefit, so AIG expected most counterparties to terminate their regulatory capital CDS by early 2010, when Basel II would be in full effect.²⁸⁶ Consistent with this expectation, by the end of 2011, AIG's regulatory capital CDS portfolio stood at only \$6.4 billion notional.²⁸⁷

Notably, even when it was far larger, this regulatory capital portfolio was not a source of write-downs or liquidity strains for AIG as it consistently had a fair value of around zero,²⁸⁸ meaning that unlike its other CDS, AIG could terminate (and indeed, has terminated) these positions at essentially no cost.

Nonetheless, the regulatory capital portfolio did cause concern among regulators during the financial crisis because while AIG was not the only institution to have sold "Basel-friendly" swaps,²⁸⁹ there was no longer a market for these derivatives that AIG's regulatory capital counterparties could turn to in the event that AIG failed.²⁹⁰ This is the derivatives version of

²⁸³ Of course, this does not take into account the effect of other losses that Goldman Sachs might have suffered on account of AIG's default (from securities lending arrangements, for example).

²⁸⁴ See AIG 2007 ANNUAL REPORT, *supra* note 271, at 122; AIG 2008 ANNUAL REPORT, *supra* note 270, at 133.

²⁸⁵ See COP AIG REPORT, *supra* note 263, at 92 n.428; David Henry et al., *How AIG's Credit Loophole Squeezed Europe's Banks*, BLOOMBERG, Oct. 16, 2008, http://www.businessweek.com/magazine/content/08_43/b4105032835044.htm.

²⁸⁶ See AIG 2008 ANNUAL REPORT, *supra* note 270, at 133-34.

²⁸⁷ AM. INT'L GRP., 2011 ANNUAL REPORT (FORM 10-K) 188 (2011).

²⁸⁸ See, e.g., AIG 2008 ANNUAL REPORT, *supra* note 270, at 130; RODDY BOYD, FATAL RISK: A CAUTIONARY TALE OF AIG'S CORPORATE SUICIDE 90 (2011) (noting that "[t]o this day...[the regulatory capital portfolio] appears to have performed quite well").

²⁸⁹ See Henry et al., *supra* note 285.

²⁹⁰ See COP AIG REPORT, *supra* note 263, at 220 (noting that "there is no market for the regulatory capital hedges").

liability interconnectedness—the drying up of the supply of credit protection. That is, though these CDS had a fair market value of around zero on AIG’s balance sheet, it seems that parties were simply not willing to offer these contracts at any price. Accordingly, regulators assumed that the European banks that had relied on AIG’s Basel-friendly swaps for regulatory capital relief would be unable to find relief elsewhere. And in the event that AIG failed, these banks would have no incentive to continue their CDS with AIG by paying the stated premiums since AIG could not be counted on to fulfill any obligations in bankruptcy. The Federal Reserve Bank of New York thus estimated that counterparties that were subject to regulatory capital requirements might have had to raise around \$18 billion in equity upon AIG’s default.²⁹¹ Given the market unrest at the time, raising such capital might have been difficult.²⁹²

Figure 1.9: Regulatory Capital Relief Recipients²⁹³
\$ billions

Firm	Estimated Capital Relief
ABN Amro	\$3.5
Danske	2.1
KFW Bank	1.9
Credit Logement	1.9
Calyon	1.6
BNP Paribas	1.5
Société Générale	1.0
Other	2.4
Total	\$16.0

But, as indicated by Figure 1.9 (which is based on the Congressional Oversight Panel’s estimate of \$16 billion in total capital relief), no individual firm would have lost more than \$3.5 billion in capital relief from AIG’s default. Given the size of the banks listed, this suggests that most would have remained above required capital adequacy levels. Yet, whether or not they would have, it is impossible to know how European bank regulators would have reacted to a decline in capital ratios. As the Congressional Oversight Panel concluded, some countries may have granted forbearance while others may have taken a tougher approach, perhaps even seizing

²⁹¹ See FCIC REPORT, *supra* note 26, at 348.

²⁹² See, e.g., COP AIG REPORT, *supra* note 263, at 92.

²⁹³ *Id.*

the non-compliant banks, although this would seem quite unlikely.²⁹⁴ The most likely outcome is that these banks would have stayed afloat. And even if this was not the case, questions remain as to whether possible damage to foreign banks should have been the focus of U.S. regulators and whether costs to prevent such damage should have been borne by U.S. taxpayers.

(b) Lehman's Effect on AIG

Although neither of the preceding problems posed by the loss of AIG's CDS were large enough to destabilize the market, it is true that they were amplified by Lehman's collapse, which immediately preceded the AIG rescue. LBHI's filing meant that "a disorderly failure of AIG could add to already significant levels of financial market fragility,"²⁹⁵ as the Federal Reserve recognized in justifying its initial aid to AIG. This fragility, however, was more a product of market sentiment than actual losses facing Lehman counterparties. As emphasized in preceding subsections, third-party exposure to LBHI and its Chapter 11 affiliates was manageable. And, of particular relevance to the AIG situation, the Big Banks could not have expected more than \$28 billion in total Lehman derivatives losses—and indeed, should have expected a much lower level of losses. It therefore does not appear to be the case that the combination of Lehman's default and AIG's failure would have rendered key financial institutions insolvent.

Yet Lehman's collapse did make some of these institutions increasingly unwilling to lend and thereby prevented a private solution to AIG's problems. In fact, after LBHI's filing, the Federal Reserve Bank of New York worked with JPMorgan and Goldman Sachs to assemble a syndicate of banks to lend AIG about \$75 billion to stave off its collapse.²⁹⁶ But the syndicate failed to reach a deal because, according to the Federal Reserve Bank of New York's general counsel, the banks decided that in light of LBHI's filing they had to protect their own balance sheets.²⁹⁷ In other words, while AIG needed liquidity for reasons unrelated to Lehman's failure, private institutions refused to provide it because of that failure.

That Lehman's bankruptcy ended the incipient private sector solution raises a question as to whether it mandated the public sector solution—that is, whether it made allowing AIG to fail

²⁹⁴ *See id.* at 92-93.

²⁹⁵ Press Release, *supra* note 266.

²⁹⁶ *See* AIG 2008 ANNUAL REPORT, *supra* note 270, at 4; FCIC REPORT, *supra* note 26, at 349.

²⁹⁷ FCIC REPORT, *supra* note 26, at 349.

untenable. There is evidence to suggest that Lehman's collapse factored into the government's thinking insofar as it heightened financial instability. Shortly after the AIG bailout, Federal Reserve Chairman Bernanke noted that the Fed's decision-making was influenced by "prevailing market conditions [which Lehman's failure influenced] and the size and composition of AIG's obligations,"²⁹⁸ which included trillions of dollars of derivatives and more than \$100 billion in debt.²⁹⁹ More generally, at the time of the bailout, the Federal Reserve and the Treasury advanced three primary justifications for the government's intervention, arguing that an AIG failure would increase systemic risk on account of (1) the potential fallout from its large derivatives operations, (2) the possibility of more disruptions to the already distressed commercial paper market, and (3) a likely weakening of the already fragile economy.³⁰⁰ To varying degrees, all three of these justifications relate to Lehman's failure because they implicate existing financial weakness that Lehman's collapse exacerbated. A later justification—that an AIG failure would have also had negative effects on the company's insurance subsidiaries³⁰¹—does not relate to Lehman's collapse at all. However, the Congressional Oversight Panel has questioned this expanded rationale, noting that it may merely be part of a government effort "to respond to public displeasure with the AIG bailout by looking for more sympathetic beneficiaries of their decision to intervene than financial institutions."³⁰² This is not to suggest that "more sympathetic beneficiaries" would not have been harmed by AIG's collapse. To the contrary, the Congressional Oversight Panel suggested that harm may have extended to numerous parties, including municipalities that had entered into more than \$12 billion in guaranteed investment agreements with AIG and pension plans that had purchased \$38 billion in wrap coverage for their stable value funds.³⁰³ While regrettable, these losses would not have resulted in systemic risk manifested by a run on the banking system and a freeze-up of financial markets.

²⁹⁸ *Hearing Before the S. Comm. on Banking, Housing & Urban Affairs*, 110th Cong. 1 (Sept. 23, 2008) (statement of Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys.), <http://www.federalreserve.gov/newsevents/testimony/bernanke20080923a1.htm>.

²⁹⁹ *See* COP AIG REPORT, *supra* note 263, at 107.

³⁰⁰ *See id.* at 107-09.

³⁰¹ *See id.* at 112.

³⁰² *Id.*

³⁰³ *See id.* at 93, 101-02.

As to the government's initially proffered rationales, its claim that "a disorderly failure of AIG could add to already significant levels of financial market fragility"³⁰⁴ most directly implicates contagion effects influenced by Lehman's failure. Since Lehman's collapse contributed to market fragility, it is plausible to argue that in the absence of Lehman's failure, the Fed and the Treasury would have been less concerned about AIG's effect on the overall financial system. On the other hand, one might argue that even before Lehman's collapse, the financial system was fragile enough that AIG's failure would have significantly impaired it.

c. Prime Brokerage Clients

The previous sections and Part I.B as a whole focus on the direct effects of the LBHI and affiliated U.S. bankruptcy filings. This section departs from that focus to consider an important group that was directly affected by the insolvency of LBIE, which had been placed into administration in the United Kingdom on September 15, 2008.³⁰⁵ In short, certain hedge funds that had used Lehman's prime brokerage unit (part of LBIE) lost access to their assets after Lehman's failure because LBIE had by then entered administration. These hedge funds may not see some of these assets again, but the negative effects of their misfortune will be relatively small.

Serving about 900 hedge funds and asset managers,³⁰⁶ LBIE held between \$40 and \$65 billion in client assets, an estimated \$22 billion of which had been rehypothecated. Through rehypothecation, Lehman was able to use hedge fund assets as security for its own funding

³⁰⁴ See Press Release, *supra* note 266.

³⁰⁵ See PricewaterhouseCoopers, *supra* note 47.

³⁰⁶ See Lindsay Fortado, *Lehman Hedge Fund Clients To Get \$3.3 Billion Payout*, BLOOMBERG, Oct. 21, 2009, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=axgsS0Sa0nZI>.

purposes.³⁰⁷ By letting Lehman do so, hedge funds subject to rehypothecation agreements were able to reduce their financing costs by as much as 2.5 percentage points.³⁰⁸

As they were attributable to Lehman's U.K.-based entity, these rehypothecation agreements were governed by U.K. law, which in several important respects treats rehypothecation differently from the way that U.S. law does. First, U.K. law enables prime brokers to rehypothecate an unlimited amount of client assets, in contrast to the regime in the United States, which limits rehypothecation to 140% of a customer's debit balance (even if the customer were to authorize more). At the same time, the U.K. framework offers customers little in the way of protection for their rehypothecated assets.³⁰⁹ Not only does the United Kingdom lack a broker-dealer protection regime akin to the Securities Investor Protection Corporation (SIPC) in the United States,³¹⁰ but once assets are rehypothecated, the pledgor loses title over them.³¹¹ Thus, in the case of Lehman, the firm's rehypothecated prime brokerage assets became part of the LBIE estate and were not available for return to customers.³¹² Hedge funds that had allowed rehypothecation therefore faced the prospect of becoming unsecured creditors to LBIE and ultimately never seeing their money again.³¹³ Regardless of whether they stood to recover any of their assets over the long term, the inability to access funds in the short term undoubtedly caused problems for a limited number of firms. Most notably, MKM Longboat Capital Advisors

³⁰⁷ PricewaterhouseCoopers's estimate that LBIE held \$32 billion in Trust Assets as of September 15, 2008, coupled with the estimate that LBIE had rehypothecated about \$22 billion in client funds, suggests that the failed entity held around \$54 billion in total client assets. See PricewaterhouseCoopers, *Lehman Brothers International (Europe) (in Administration)—Claim Resolution Agreement Receives Overwhelming Support*, Dec. 29, 2009, <http://www.ukmediacentre.pwc.com/content/detail.aspx?releaseid=3532&newsareaid=2>. For other estimates, see James Mackintosh, *Lehman Collapse Puts Prime Broker Model in Question*, FIN. TIMES, Sept. 24, 2008, http://us.ft.com/ftgateway/superpage.ft?news_id=fto092420081706282339&page=2 (suggesting that LBIE held \$40 billion); Ianthe Jeanne Dugan & Cassell Bryan-Low, *In a Suicide, Crisis and Life Cross*, WALL ST. J., Nov. 15, 2008, http://online.wsj.com/article/NA_WSJ_PUB:SB122671299673730273.html (suggesting that it held \$65 billion).

³⁰⁸ See Mackintosh, *supra* note 307.

³⁰⁹ See Manmohan Singh & James Aitken, *The (Sizable) Role of Rehypothecation in the Shadow Banking System 4* (Int'l Monetary Fund, Working Paper No. 10/172, July 2010).

³¹⁰ See *id.*

³¹¹ See *FAQs for Trust Property 19/3/09*, PRICEWATERHOUSECOOPERS, http://www.pwc.co.uk/eng/issues/lehman_faqs_trust_property_client_assets.html (last visited Feb. 10, 2012).

³¹² See *id.*

³¹³ See Witness Statement of Steven Anthony Pearson at 28, In the Matter of Lehman Bros. Int'l (Eur.) (in administration) and In the Matter of the Insolvency Act 1986 (The Court of High Justice Oct. 7, 2008) (Claim No. 7942); DealBook, *Wachtell Lipton's Lessons from Lehman*, N.Y. TIMES, Nov. 12, 2008, <http://dealbook.blogs.nytimes.com/2008/11/12/wachtell-liptons-lessons-from-lehman/>.

closed its \$1.5 billion fund partly because of frozen assets,³¹⁴ and the chief operating officer of Olivant Ltd. committed suicide apparently because the fund had accumulated a \$1.4 billion equity stake in UBS that it placed at LBIE and was believed to be unlikely to recover.³¹⁵

However, the freeze of LBIE's prime brokerage assets did not produce widespread or large-scale negative consequences, in part because of the small size of Lehman's prime brokerage operation. Before the collapse of Bear Stearns, the prime brokerage industry had long been dominated by just three firms, with Goldman Sachs, Morgan Stanley, and Bear Stearns accounting for roughly two-thirds of the market.³¹⁶ Lehman had never been a large player in the industry. Even if it had been, its collapse still may not have triggered extensive problems in the hedge fund community because in the wake of Bear Stearns's demise, funds increasingly used multiple prime brokers to mitigate counterparty risk.³¹⁷ In fact, despite the traditionally concentrated structure of the prime brokerage business, as far back as 2006 about 75% of hedge funds with at least \$1 billion in assets under management relied on the services of more than one prime broker.³¹⁸ Further, concerns about concentration in prime brokerage could be better addressed by more stringent segregation requirements of the kind the CFTC has imposed in the wake of the MF Global bankruptcy.³¹⁹

The fact that not all of LBIE's prime brokerage assets were, or should have been, commingled with other funds further mitigated the impact of LBIE's insolvency. When it went into administration, LBIE held \$2.16 billion in segregated accounts and, based on the

³¹⁴ Tom Cahill, *Lehman Hedge-Fund Clients Left Cold as Assets Frozen*, BLOOMBERG, Oct. 1, 2008, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=adjHB.7sflDA&refer=home>.

³¹⁵ See Dugan & Bryan-Low, *supra* note 307; Proof of Claim, Olivant Investments Switzerland, Claim No. 22636, at 6, *In re Lehman Brothers Holdings Inc. et al.*, No. 08-13555 (Bankr. S.D.N.Y. Sept. 21, 2009).

³¹⁶ Jeff Nash, *Broker Biz up for Grabs after Bear Buyout*, FIN. WK., Apr. 7, 2008, <http://www.financialweek.com/apps/pbcs.dll/article?AID=/20080407/REG/96288473/1006/toc>.

³¹⁷ See MERRILL LYNCH GLOBAL MKTS. & INVESTMENT BANKING, THE MULTI-PRIME BROKER ENVIRONMENT: OVERCOMING THE CHALLENGES AND REAPING THE BENEFITS 2 (June 2008), <http://www.ml.com/media/113487.pdf>.

³¹⁸ *Id.* at 1.

³¹⁹ See Investment of Customer Funds and Funds Held in an Account for Foreign Futures and Foreign Options Transactions, 76 Fed. Reg. 78,776 (Dec. 19, 2011) (to be codified at 17 C.F.R. pt. 1, 17 C.F.R. pt. 30).

understanding of certain clients, was supposed to have segregated several billions more.³²⁰ The money that should have been segregated but for various reasons was not has become the subject of intense litigation as questions have arisen about whether entities making claims to this money should be treated as unsecured creditors or, more beneficially for them, as clients whose funds were segregated. In December 2009, a U.K. High Court judge adopted the former stance: while highly critical of Lehman's failure to segregate certain assets, the judge held that clients whose assets should have been segregated but were instead commingled would not receive the same protections as those entities whose money had actually been segregated.³²¹ In August 2010, an appeals court reversed the decision and ruled that clients whose money should have been segregated would be treated as if their funds had been.³²² Although the total size of the claims that may be affected by this ruling is unclear, it is clear that some hedge funds will now obtain higher payouts to the detriment of the pool of general unsecured creditors, which includes hedge funds whose assets were not and should not have been segregated. Moreover, according to LBIE's administrator, PricewaterhouseCoopers, the decision is likely to slow the return of money to clients.³²³

d. Structured Securities Investors

Derivatives linked parties to Lehman in another fashion as Lehman guaranteed and issued tens of billions of dollars in face value of structured securities whose characteristics are explained below.³²⁴ These securities attracted the interest of retail investors, who viewed the instruments as low-risk investments offering the possibility of high returns.³²⁵ Lehman, in turn, increasingly relied on structured securities as a means of obtaining relatively cheap funding in a

³²⁰ See Cassell Bryan-Low, *U.K. Ruling Spells Out Lehman Asset Protections*, WALL ST. J., Dec. 15, 2009, http://online.wsj.com/article/NA_WSJ_PUB:SB10001424052748703438404574598212808074336.html; Lindsay Fortado, *CRC Wins Appeals Court Ruling It Can Access Lehman Client-Money Accounts*, BLOOMBERG, Aug. 2, 2010, <http://www.bloomberg.com/news/2010-08-02/crc-credit-fund-wins-u-k-court-ruling-over-lehman-client-money-accounts.html>.

³²¹ *Lehman Brothers Int'l (Europe) (in Administration) v. CRC Credit Fund Ltd. and Others*, [2009] EWHC (Ch) 3228 (Eng.).

³²² *Lehman Brothers Int'l (Europe) (in Administration) v. CRC Credit Fund Ltd. and Others*, [2010] EWCA (Civ) 917 (Eng.).

³²³ See Fortado, *supra* note 320.

³²⁴ See SECURITIES LITIGATION & CONSULTING GROUP, *STRUCTURED PRODUCTS IN THE AFTERMATH OF LEHMAN BROTHERS 2* (2009).

³²⁵ See *id.* at 2-3.

market that was growing wary of its credit risk.³²⁶ Indeed, from 2007 to 2008 alone, Lehman issued approximately \$19.2 billion of structured securities (a much larger sum than in previous two-year periods),³²⁷ and in total, parties would file about \$78 billion in guarantee claims against LBHI on account of such “program securities”³²⁸ and will probably suffer about \$20 billion in pre-settlement losses.

While in aggregate the losses are likely to be large, they have not been and will not be destabilizing for three reasons. First, although some of Lehman’s structured securities were issued to institutions,³²⁹ they tended to be issued mainly to retail investors.³³⁰ Thus the investor base for these products posed little systemic risk in the first place. To be sure, systemically important institutions have ended up bearing some of the losses that individual investors incurred, but, as described below, these losses have not proven problematic for these firms. Second, because structured products tend to be issued in small denominations,³³¹ few direct investors—whether retail or institutional—are likely to have borne large losses individually. Indeed, underscoring the small size of most note issuances, more than 4,000 series of structured notes issued under Lehman’s EMTN Program were outstanding at the time of LBHI’s filing.³³² Finally, unlike many other creditors to Lehman, structured security investors have already successfully pursued—and can be expected to continue to pursue—settlements from other entities, namely the financial institutions that sold the instruments on behalf of Lehman.³³³ These financial institutions do pose greater systemic risk than the investors who generally purchased the products, but there is no evidence that the settlements will prove problematic for these firms.

For similar reasons, the losses stemming from so-called “minibonds” will be manageable. Ironically, these structured products received the most attention in the aftermath of

³²⁶ See *id.* at 15, 18.

³²⁷ *Id.* at 15.

³²⁸ Disclosure Statement for Initial Plan, *supra* note 15, Annex A-3; see Lehman Programs Securities, July 17, 2009, http://www.svsp-verband.ch/download/faq/20090724_program_securities_list_de.pdf.

³²⁹ See Disclosure Statement for First Amended Plan, *supra* note 54, Exhibit 9-9.

³³⁰ See *supra* text accompanying note 325.

³³¹ See, e.g., Jennifer Bethel & Allen Ferrell, *Policy Issues Raised by Structured Products* 8 (Discussion Paper No. 560, 2006), http://www.law.harvard.edu/programs/olin_center/papers/pdf/Ferrell_et%20al_560.pdf.

³³² Disclosure Statement for First Amended Plan, *supra* note 54, Exhibit 9-9 to 9-10.

³³³ See *Financial Institutions Offering to Repurchase Lehman Notes in Some Countries While Fighting Investors in Others*, LEHMANNOTES.COM, Nov. 16, 2010, <http://www.lehmannotes.com/2010/11/financial-institutions-offering-to-repurchase-lehman-notes-in-some-countries-while-fighting-investor.html>.

Lehman's collapse although they were actually not issued by Lehman. Minibond investors are therefore not creditors to the Lehman estate in the manner that Lehman structured securities investors are. Indeed, courts have reached different conclusions as to whether they can seek any type of recovery from Lehman,³³⁴ and the Lehman estate has questioned the validity of some of the minibond claims.³³⁵

i. Exposure to Lehman's Structured Securities

The impact of LBHI's filing on Lehman-issued structured securities investors stems from the basic, though often obscured, properties of the products. Although structured securities come in a variety of forms and tie returns to a variety of different assets, most amount to a hybrid of a vanilla credit instrument—in effect, an unsecured loan—and a derivative. One such variant, principal protected notes, provides investors with exposure to a particular asset (a stock index, for instance) while promising to return their full principal upon maturity.³³⁶ Investors are thereby able to obtain the chance of enhanced returns with no apparent downside—a seemingly “no-lose” prospect that explains their appeal to individuals. The downside, of course, comes from the possible failure of the guarantor to honor the guarantee. And, even if the guarantor does honor the guarantee, investors tend to pay far more for the instruments than they are worth.

One variation of the product is a principal protected note, which is the equivalent of a zero-coupon bond and an option on an asset or a basket of assets. For every \$100 the investor pays for this combination, he is guaranteed \$100 at the note's maturity, but at issuance the combination may be worth well under \$100 owing to the time value of money. For instance, one study examining a representative Lehman principal protected note found that it was worth only about \$89 per \$100 invested when it was issued in August 2008.³³⁷ In other words, if an investor could buy the underlying zero-coupon bond and option combination at market prices, it would be able to exactly replicate the note's pay-off for 11% less than the note's cost (equal to its face value). Seen differently—if one takes the implied funding rate on these products to be the rate

³³⁴ See Carla Main, *Lehman Minibonds, Comercial Mexicana, Chemtura, Circuit City: Bankruptcy*, BLOOMBERG, Aug. 10, 2010, <http://www.bloomberg.com/news/2010-08-10/lehman-minibonds-comercial-mexicana-chemtura-circuit-city-bankruptcy.html>.

³³⁵ See Disclosure Statement for First Amended Plan, *supra* note 54, Exhibit 6-4 to 6-5.

³³⁶ See, e.g., SLCG, *supra* note 324, at 2.

³³⁷ *Id.* at 3-4.

that would equate the zero-coupon bond/option combination with the products' face value—such notes provided issuers with unusually low (and in some cases, negative) financing rates.³³⁸ For Lehman, these rates became more attractive as its costs of traditional debt funding rose beginning in 2007. Accordingly, the firm issued a record amount of structured products in the two years preceding its collapse.³³⁹

The investors who purchased such products not only paid more than they were worth but also exposed themselves to the issuer's credit risk—a fact that explains the source of their losses from Lehman's collapse. Indeed, principal protected notes and other structured products are only “protected” if the issuer pays the amount due at maturity. As Lehman's structured products were issued through its EMTN Program primarily by European affiliates,³⁴⁰ the ultimate recovery on these products depends partly on the resolution of Lehman proceedings outside the United States. However, because these instruments were also subject to a blanket LBHI guarantee,³⁴¹ about \$78 billion in total third-party guarantee claims were filed against LBHI on account of “program securities.”³⁴² But the Initial Plan adjusted this sum down to just over \$27 billion,³⁴³ and the Amended Plan arrived at a similar figure, estimating \$31.5 billion in valid claims on account of LBHI-guaranteed securities and \$5.5 billion on account of LBHI's own issuance.³⁴⁴ These revised numbers seem more reasonable than the magnitude of the originally filed claims, for they more closely match the amount of structured notes outstanding at the time of Lehman's collapse.³⁴⁵

Even assuming that investors would not recover anything in the Lehman bankruptcy, aggregate exposure overstates losses borne by direct investors because certain financial institutions that sold Lehman structured products have reached settlements with the products' purchasers. In April 2010, Citigroup, for example, paid around \$110 million to buy back Lehman-issued products at fifty-five cents on the dollar from more than 2,700 Spanish investors,

³³⁸ *See id.* at 17-18.

³³⁹ *See id.* at 15-16.

³⁴⁰ *See* Disclosure Statement for Initial Plan, *supra* note 15, at 37.

³⁴¹ *Id.*

³⁴² *Id.* Annex A-3.

³⁴³ *Id.*

³⁴⁴ *See* Disclosure Statement for First Amended Plan, *supra* note 54, at Exhibit 11-1.

³⁴⁵ *See* Disclosure Statement for Initial Plan, *supra* note 15, at 37.

and the bank has recently made an analogous offer to Hungarian investors.³⁴⁶ Similarly, Credit Suisse spent over \$85 million to buy back Lehman-issued products from Swiss nationals.³⁴⁷

In this way, the exposure of direct investors who posed little systemic risk because of their generally retail composition and the small size of their investments has been aggregated and transferred to institutions that can be considered systemically risky. But the payouts have occurred well after Lehman's collapse, when large financial institutions were in a better position to make them. Moreover, their magnitude is relatively small.

ii. The Minibond Saga

Another set of structured products that received significant attention surely did not pose interconnectedness problems. These minibonds—credit-linked structured notes sold to Asian retail investors subject to certain LBHI guarantees but not issued by Lehman entities—had attracted the interest of about 43,000 retail investors in Hong Kong and about 10,000 in Singapore, who together invested approximately \$2 billion in the products on account of their enhanced fixed coupons.³⁴⁸ While they aroused considerable concern in the wake of LBHI's filing,³⁴⁹ the minibonds have not posed any systemic risk because they had an entirely retail investor base, only about \$2 billion was invested in the instruments, and investors have already received sizable recoveries and may recover even more. Further, while some of these recoveries have come from more systemically risky institutions (which distributed the products), institutional losses are likely to be small given the small size of the overall investment in the instruments, the ultimate worth of the collateral underlying them, and the large number of institutions participating in settlements.

³⁴⁶ See *Financial Institutions*, *supra* note 333.

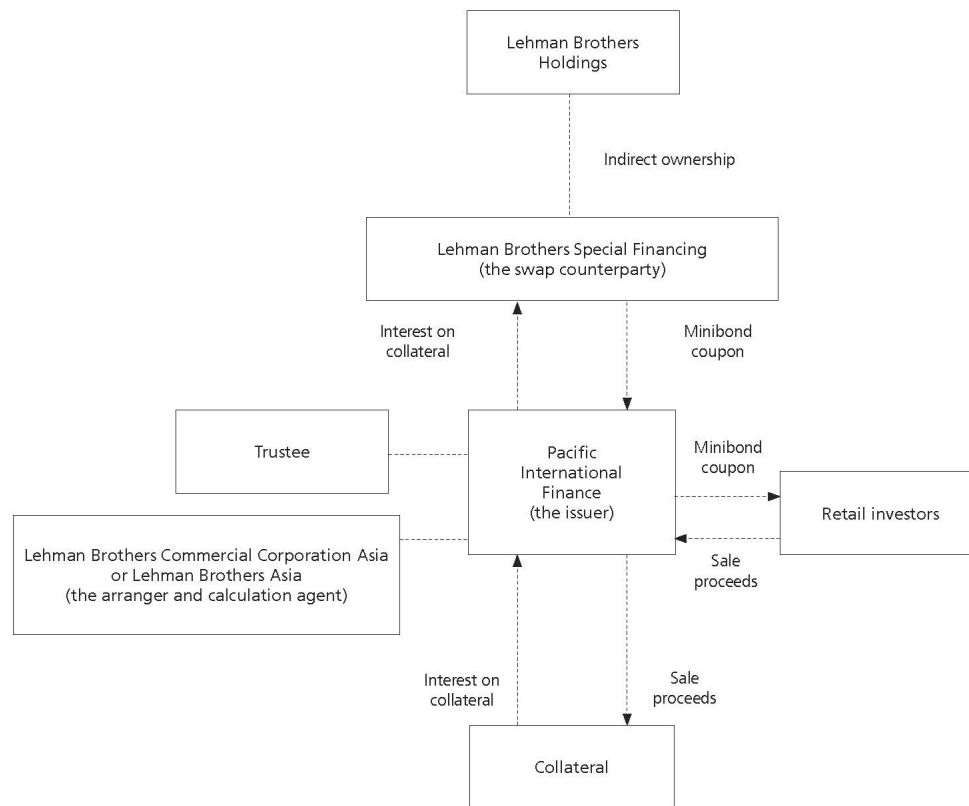
³⁴⁷ See *id.*

³⁴⁸ See Valerie Chew, Nat'l Library Bd. Singapore, *Lehman Brothers Minibond Saga*, SINGAPORE INFOPEdia, Mar. 19, 2010, http://infopedia.nl.sg/articles/SIP_1654_2010-03-19.html; Freshfields Bruckhaus Deringer, *An Overview of the Lehman Brothers Minibonds Saga*, FIN. SERVS. MKT. DEVELOPMENTS, Dec. 16, 2008, at 1.

³⁴⁹ See Mark Pittman & Bob Ivry, *London Suicide Connects Lehman Lesson Missed by Hong Kong Woman*, BLOOMBERG, Sept. 9, 2009, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aNFuVRL73wJc>.

Figure 1.10: Structure of Lehman Minibonds³⁵⁰

A typical series of minibonds



At their core, the minibonds amounted to a sale to LBSF by bond issuers, and ultimately the retail investors to whom the issuers sold the bonds, of first-to-default CDS on a basket of reference entities (for example, a set of seven institutions focused on the financial sector³⁵¹) in exchange for a fixed premium guaranteed by LBHI. As collateral for LBSF in connection with the CDS and for the investors to secure their return of principal, the bond issuers used investor proceeds to purchase notes—usually, synthetic CDOs linked to the creditworthiness of other highly rated entities likely distinct from those that were the reference entities on the CDS.³⁵² While the synthetic CDOs had to meet pre-specified credit criteria, the entities that they referenced were not necessarily known to investors before purchase. Investors were thus advised

³⁵⁰ Freshfields, *supra* note 348, at 2.

³⁵¹ See, e.g., Minibond Series 2, *Pricing Statement Dated 19 July 2006*, at iv, <http://www.lioninvestor.com/code/uploads/minibond-series-2-pricing-statement.pdf> (referencing American Express, Bank of America, DBS Bank, HSBC, J.P. Morgan, Singapore Telecommunications, and Standard Chartered).

³⁵² See *id.* at 20; Letter from Lehman Brothers Asia Ltd. to Distributors and Holders of Minibonds (Sept. 17, 2008), http://www.hkbea.com/FileManager/EN/Content_2396/20080923qa_e.pdf.

“to rely on the criteria which the [CDOs] must meet in reaching [their] decision to buy [the minibonds].”³⁵³ This bespoke collateral that underlay the minibonds exposed investors not only to credit risk, if the obligors on the notes failed to pay, but also to market and liquidity risk, because in the event the collateral needed to be liquidated, it would likely have to be sold at a discount to its intrinsic value in light of “the lack of an active trading market.”³⁵⁴

The collateral generated floating interest, which the issuers swapped into fixed payments by entering into interest rate swaps with LBSF that were also guaranteed by LBHI.³⁵⁵ However, if one of the reference entities in the basket CDS experienced a credit event, the flow of coupons would cease, and the bonds would redeem early.³⁵⁶ Under such an occurrence, the issuers would deliver LBSF the collateral and the investors would receive from LBSF (through the issuer) only a percentage of their principal based on the market value of the debt of the reference entity that had experienced the credit event.³⁵⁷ Thus, a default of one of the reference entities would have likely exposed investors to significant losses.

In actuality, the reference entities did not experience any credit events. Rather, investors suffered significant losses from liquidation of the underlying collateral prompted by LBHI’s bankruptcy filing. Under the terms of the minibonds, LBHI’s filing triggered liquidation since it constituted an event of default, entitling the issuers of the bonds to terminate their LBSF swaps early and in turn redeem the bonds by selling the collateral.³⁵⁸ If the collateral had consisted of liquid, relatively riskless securities and market conditions were stable, liquidation may not have proven problematic. But, as noted above, the collateral consisted of illiquid customized securities that would have been difficult to sell for close to intrinsic value even in favorable times.³⁵⁹ In fact, some commentators have suggested that the collateral was so problematic that investors would have lost money even if, in the absence of LBHI’s filing, the collateral had been

³⁵³ Minibond Series 2, *supra* note 351, at 10.

³⁵⁴ *See id.* at 20-21.

³⁵⁵ *See id.* at 18; Freshfields, *supra* note 348, at 1.

³⁵⁶ Minibond Series 2, *supra* note 351, at 3-4.

³⁵⁷ *See id.* The amount that the investors received (and LBSF paid) was augmented (reduced) by the extent to which the collateral’s value exceeded (fell short of) the bonds’ principal. *See id.* In other words, if the collateral backing \$100 million of the bonds proved to be worth \$110 million, LBSF would deliver the investors an additional \$10 million; conversely, if the collateral was worth only \$90 million, LBSF would deliver \$10 million less than it otherwise would have.

³⁵⁸ *See* Freshfields, *supra* note 348, at 3.

³⁵⁹ *See* Minibond Series 2, *supra* note 351, at 21.

liquidated at the bonds' maturity.³⁶⁰ Either way, it is clear that markets were far from favorable in the aftermath of LBHI's filing: as credit fears intensified, the market value of the collateral declined and the trading discount from this value increased as parties were less willing to assume illiquid assets.³⁶¹ This in turn meant that investors stood to incur large losses.³⁶²

In the face of such potential losses, Hong Kong and Singapore regulators pledged support for minibond investors,³⁶³ many of whom were retirees who had placed a sizable portion of their wealth in the instruments.³⁶⁴ In keeping with their pledge, in July 2009, Hong Kong regulators struck a deal with sixteen banks that had distributed minibonds, establishing a repurchase scheme through which the distributing banks would give eligible customers below sixty-five years of age a minimum of 60% of the bonds' principal and eligible customers sixty-five or older a minimum of 70% (with recoveries potentially further increased by the liquidation of the minibonds' collateral).³⁶⁵ In Singapore, recovery from collateral (distributed in February 2010) and settlements with financial institutions resulted in the nearly 9,000 individuals who had purchased one of nine series of minibonds receiving a total of 64.5% of their invested principal.³⁶⁶ Further, among these investors, 12% received all of their money back.³⁶⁷

Hong Kong investors are seeking to recover more of their losses through a lawsuit against LBSF and HSBC (the minibond trustee)³⁶⁸ and through claims in Lehman's Chapter 11

³⁶⁰ See Freshfields, *supra* note 348, at 3.

³⁶¹ See Andrew Godwin, *The Lehman Minibonds Crisis in Hong Kong: Lessons for Plain Language Risk Disclosure*, 32 U.N.S.W. L.J. 547, 561 (2009).

³⁶² See Freshfields, *supra* note 348, at 3.

³⁶³ See Patricia Kuo, *Asian Regulators Pledge Action After Lehman Protests*, BLOOMBERG, Sept. 23, 2008, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a.bIQfrwxlDE&refer=asia>.

³⁶⁴ See Pittman & Ivry, *supra* note 349.

³⁶⁵ See *A Repurchase Scheme for Lehman Brothers Minibonds Proposed by 16 Distributing Banks and Agreed by the Regulatory Authorities To Enable All Parties Concerned To Move Forward*, July 23, 2009,

http://www.hkbea.com/FileManager/EN/Content_3096/20090723e.pdf [hereinafter *Hong Kong Repurchase Scheme*]; Leslie Tang, *HK Securities Regulator Aims To Avoid Repeat of Lehman Minibond Saga*, CHANNEL NEWSASIA, Sept. 18, 2009, <http://www.channelnewsasia.com/stories/economicnews/view/1005865/1/.html>.

³⁶⁶ See Monetary Authority of Singapore, *MAS Welcomes Announcement of the Distribution of the Recovery Values of the Minibond Notes*, Feb. 3, 2010, http://www.mas.gov.sg/news_room/press_releases/2010/MAS_Welcomes_Announcement_of_The_Distribution_of_The_Recovery_Values_of_The_Minibond_Notes.html.

³⁶⁷ See *id.*

³⁶⁸ See *Wong v. HSBC USA, Inc.*, 2010 WL 3154976 (S.D.N.Y. Aug. 9, 2010).

proceedings.³⁶⁹ However these matters are ultimately resolved, it seems that, given the existing settlement agreements, retail investors will suffer well under \$1 billion in total losses. And depending on the ultimate value of the Hong Kong minibonds' collateral upon disposition (and the extent to which the trustee can distribute it), individual investor losses could prove negligible. In any event, they will likely be far smaller than those borne by purchasers of Lehman-issued structured securities.

Institutional losses from investor settlements will also be even more manageable than those related to Lehman structured securities settlements. Beyond the fact that the total amount invested in the minibonds was a fraction of the amount directed to Lehman's structured securities, institutions that have entered into settlements for the minibonds might obtain higher recoveries. For one thing, Singapore institutions have already obtained recoveries from the disposition of minibond collateral, and the evidence suggests that the liquidation value of the minibonds was substantially above zero.³⁷⁰ Moreover, based on the payout structure under the Hong Kong settlement, if the collateral is liquidated for at least 70% of invested principal, distributing banks will not lose anything at all.³⁷¹

e. Money Market Funds

As will be discussed in Part II, the U.S. money market industry was afflicted by significant contagion in the aftermath of Lehman's collapse. But asset interconnectedness, which this section discusses, was a much less significant problem because, while multiple funds held Lehman debt, only one fund actually had to "break the buck" on account of its Lehman exposure and even this exposure was quite small.

Money market funds, which managed \$3.8 trillion in assets in the United States by the end of 2008,³⁷² were a key part of Lehman's unsustainable funding model as they financed Lehman and other large financial institutions' long-term assets through short-term tri-party

³⁶⁹ See Disclosure Statement for First Amended Plan, *supra* note 54, Exhibit 6-4 to 6-5; Disclosure Statement for Third Amended Plan, *supra* note 73, Exhibit 6-5 to 6-6.

³⁷⁰ See Monetary Authority of Singapore, *supra* note 366.

³⁷¹ See *Hong Kong Repurchase Scheme*, *supra* note 365.

³⁷² Naohiko Baba et al., *U.S. Dollar Money Market Funds and Non-U.S. Banks*, BIS Q. REV., Mar. 2009, at 65, 68.

repos.³⁷³ Repo financing, however, was not the source of money market funds' problems in the wake of Lehman's collapse. Money market funds also invested in short-term commercial paper.³⁷⁴ This paper was supposed to carry negligible credit risk, but it became increasingly risky—and in the years leading up to Lehman's collapse, certain money market funds began to take more risk as they sought higher yields in a quest for market share.³⁷⁵

The flagship of the fastest growing fund family over the preceding several years—the \$62.6 billion Reserve Primary Fund (RPF)—had invested \$785 million in unsecured Lehman commercial paper, accounting for about 1.25% of its assets.³⁷⁶ While the RPF did not immediately write down the value of its Lehman investment and continued to report a net asset value (NAV) of one dollar on September 15, 2008, the fund faced redemption requests totaling almost \$25 billion.³⁷⁷ Unlike other funds that had invested in what became worthless Lehman paper, the RPF could not rely on credit support from a deep-pocketed parent to maintain the fund's NAV,³⁷⁸ and the fund's adviser instead moved to liquidate its entire portfolio on September 16 amid continued redemption requests.³⁷⁹ By the end of September 16, the RPF had finally re-marked its Lehman holdings to zero, causing the fund to break the buck with an NAV of \$0.97.³⁸⁰ The occurrence marked only the second time in the previous thirty years that a money market fund's reported NAV had dipped below one dollar and the first time that such a large fund's NAV had done so.³⁸¹

³⁷³ See *Written Testimony Before the H. Comm. on Fin. Servs.*, 111th Cong. (Apr. 20, 2010) (statement of Timothy Geithner, Secretary, U.S. Dep't of the Treasury), <http://www.treasury.gov/press-center/press-releases/Pages/tg645.aspx>.

³⁷⁴ Baba et al., *supra* note 372, at 68.

³⁷⁵ *Id.* at 71-72.

³⁷⁶ INV. CO. INST., REPORT OF THE MONEY MARKET WORKING GROUP 59 (Mar. 17, 2009) [hereinafter ICI MONEY MARKET REPORT].

³⁷⁷ *Id.*

³⁷⁸ Baba et al., *supra* note 372, at 72. Indeed, facing a class-action lawsuit, the Reserve Primary Fund has relied on the support that other funds received to argue that it was really not the only fund to break the buck. In its motion to dismiss the class-action suit, the Reserve Primary Fund's attorneys noted, "The fact that these funds were backed by large financial institutions, which could cover the investment losses, does not mean that the funds' investment strategies did not lead to them breaking the buck." Daisy Maxey, *Reserve Fund's Manager Says It Wasn't Only One To 'Break the Buck,'* WALL ST. J., Sept. 5, 2010, <http://online.wsj.com/article/SB10001424052748703598204575472660487030180.html>.

³⁷⁹ ICI MONEY MARKET REPORT, *supra* note 376, at 60.

³⁸⁰ *Id.*

³⁸¹ Baba et al., *supra* note 372, at 68, 72; David Serchuk, *Another Run on Money Market Funds?*, FORBES, Sept. 25, 2009, <http://www.forbes.com/2009/09/24/money-market-lehman-intelligent-investing-break-buck.html>.

Because of the extreme rarity of the event, the RPF's breaking the buck spurred a run on the prime money market industry as a whole. However, this severe money market run was not a by-product of asset interconnectedness, for other funds did not incur catastrophic losses on account of their exposure to Lehman. Moreover, even the RPF's losses from Lehman exposure were quite small as the fund held only \$785 million of Lehman debt. Indeed, even if the RPF had not been able to recover anything for this debt, investors would have received about a 98.75% recovery, according to the fund's subsequent projections.³⁸² And, in fact, the RPF was able to sell its Lehman holdings for over twenty-one cents on the dollar,³⁸³ so through July 2010, investors have received a recovery of over 99%.³⁸⁴

That investors will ultimately lose less than 1% from the RPF's collapse underscores the insignificance of asset interconnectedness to the money market run. To be sure, Lehman's demise was of great significance to the money market industry, but not because money market funds, including the RPF, were saddled with massive amounts of Lehman debt. Rather, the driver of problems for money market funds was the declining investor confidence that the RPF's collapse engendered. This was a chief symptom of contagion, which is discussed in Part II.

B. Liability Interconnectedness

Financial institutions are not only connected through exposure on the asset side of the balance sheet, but also on the liability side through interbank funding relationships. While Lehman's failure did not pose a problem through this channel, nor was this a problem in the crisis, the systemic risk implications of liability interconnectedness should not be ignored. This Part I.B examines the potential concerns with liability interconnectedness as explored in the economic literature on network theory.

³⁸² See Press Release, The Primary Fund, A Statement Regarding Calculations of Potential Distributions on a Pro Rata Basis (Aug. 25, 2009), http://www.primary-yieldplus-inliquidation.com/pdf/Press_Release_StmtReCalc_082509.pdf.

³⁸³ See Press Release, The Primary Fund, Additional Information Regarding the Reserve Primary Fund (May 27, 2010), http://www.primary-yieldplus-inliquidation.com/pdf/AdditionalInformation_PrimaryFund_052710.pdf.

³⁸⁴ See Press Release, The Primary Fund, Reserve Primary Fund To Distribute \$215 Million (July 15, 2010), http://www.primary-yieldplus-inliquidation.com/pdf/PrimaryDistribution_71510.pdf.

1. Network Theory

As emphasized throughout this Part, modern financial markets are a highly complex system of financial institutions with a high degree of interdependence and interconnections. As such, this system is a natural candidate to be analyzed through the lens of network theory. The primary goal of the network theory approach is to gain a deeper understanding of how the specific structure of the network affects the propagation of a shock through the network. Furthermore, the stability of the entire system depends on the location in the network of the institution affected by the shock. Applying network theory to financial markets can help to determine the significance of liability interconnectedness in creating network externalities that result in systemic failure.

2. Liability Interconnectedness and Systemic Failure

Over the past decade, economic theory has explored the network effects of interbank lending, examining both direct funding links between banks (e.g., Bank A lends directly to Bank B)³⁸⁵ and indirect liquidity links through common exposure to aggregate funding (e.g., Bank A and Bank B both contribute to and rely upon an aggregate liquidity market).³⁸⁶ In general, the decision by a single bank to hoard liquidity can cause other connected banks to start hoarding liquidity themselves. This process will propagate through the interbank connections until no new connected bank suffers distress or the entire system has been infected. In summary, “hoarding can potentially spread across the system, with the structure and connectivity of the unsecured interbank network playing a critical role in determining the evolution of contagion.”³⁸⁷

The characteristics of a financial network that are important to analyze when assessing systemic risk in the network include the completeness and complexity of the network, the degree of interconnectedness and the concentration of the institutions in the network.

³⁸⁵ See, e.g., Franklin Allen & Douglas Gale, *Financial Contagion*, 108 J. POL. ECON. 1, 4 (2000); Xavier Freixas, Bruno M. Parigi & Jean-Charles Rochet, *Systemic Risk, Interbank Relations, and Liquidity Provision by the Central Bank*, 32 J. MONEY, CREDIT & BANKING (Aug. 2000).

³⁸⁶ See, e.g., Douglas W. Diamond & Raghuram G. Rajan, *Liquidity Shortages and Banking Crises*, 60 J. FIN. 615 (Apr. 2005).

³⁸⁷ Prasanna Gai, Andrew Haldane & Sujit Kapadia, *Complexity, Concentration and Contagion*, 58 J. MONETARY ECON. 453 (2011).

a. Completeness, Complexity and Connectedness

Allen and Gale analyzed how direct funding linkages of banks introduce the possibility of systemic failure.³⁸⁸ They show that an interbank lending system in which banks engage in cross holdings of deposits effectively insures each individual bank against an idiosyncratic liquidity shock. If Bank A and Bank B each hold each other's deposits, a liquidity shock to Bank A can be met by liquidating its holdings in Bank B. However, despite the benefits, a limitation of this system is that cross holdings of deposits simply *redistribute* liquidity and do not *create* liquidity. This network works well when there is sufficient aggregate liquidity in the system, but in the case of excess aggregate demand for liquidity, these direct liability links can cause system-wide failure. A small, localized liquidity shock to one bank, and consequential failure of that bank, can spread through the entire financial network through the direct interbank lending arrangements.

Importantly, Allen and Gale find that the systemic risk due to the liability interconnectedness of the banks depends on the structure of the network. They demonstrate that a given exogenous shock results in systemic failure in some structures but not in others. In particular, a complete interbank system, in which each bank lends equally to every other bank (i.e., a high degree of liability interconnectedness), is more stable and resilient than an incomplete structure, where banks are only linked to a single neighbor. Intuitively, in a complete network the liquidity impact of a single bank failure is diffused throughout the system and absorbed by all other banks with no further failures.

Diamond and Rajan also analyzed the network effect of liability interconnectedness through the indirect linkages.³⁸⁹ They show in their model that when an initial shock causes a bank to fail, this failure shrinks the overall pool of common liquidity available for the remaining solvent banks in the network. The resulting liquidity shocks due to a reduction in aggregate liquidity can cause previously solvent banks to fail as well. A negative feedback effect unravels the system, where insolvency reduces liquidity, which then causes further insolvency, and so on. The end result can be complete systemic collapse of the financial network.

³⁸⁸ Allen & Gale, *supra* note 385.

³⁸⁹ Diamond & Rajan, *supra* note 386.

The Allen and Gale conclusion that a complete highly connected financial network is the most stable structure only holds for a particular range of initial shocks. Haldane explains, and Acemoglu formalizes, the theory that the network effects of the level of interconnectedness have a certain “knife-edge” feature.³⁹⁰ For a range of initial shocks, the numerous interconnections between banks serve as a “shock-absorber,” diffusing the shock throughout the vast system. The network provides mutual insurance to each institution and negative shocks dissipate with no systemic consequences. While the institution hit with the initial shock may fail, the interconnections give the network a risk-sharing feature that ensures there are no further failures. However, this range of absorbable shocks is bounded by a “tipping point.” Beyond this point the network endures a phase transition where the interconnections no longer dampen the shock, but rather serve to amplify and propagate the damage throughout the system. The interconnections now give the network a risk-spreading feature. Connected institutions are unable to absorb the shock and every institution in the network fails. “The system acts not as a mutual insurance device but as a mutual incendiary device.”³⁹¹ In this case, a network with weaker connections is strictly more robust since fewer interconnections keep the initial large shock confined to a smaller region. While the precise threshold of absorbable shocks can be difficult to specify, the existence of such “tipping points” in a connected network can be proved.³⁹²

b. Concentration

The concentration of the network also plays an important role in the propagation of a shock through the system. A more concentrated fat-tailed network is one with a small number of highly connected key players, where connectedness refers to both the number of interbank relationships and the total value of those relationships.³⁹³ Similar to the conclusion regarding the complexity of a network, a concentrated network is more robust to random shocks than less concentrated networks provided the shocks are within a given range.³⁹⁴ However, for shocks

³⁹⁰ Andrew G. Haldane, Exec. Dir., Fin. Stability, Bank of England, Speech Delivered at the Financial Student Association: Rethinking the Financial Network (Apr. 2009); Daron Acemoglu, Asu Ozdaglar & Alireza Tahbaz-Salehi, *Systemic Risk and Stability in Financial Networks* (Jan. 2012), available at <http://economics.mit.edu/files/7518>.

³⁹¹ Haldane, *supra* note 390, at 10.

³⁹² Prasanna Gai & Sujit Kapadia, *Liquidity Hoarding, Network Externalities, and Interbank Market Collapse* (2011), http://www.cambridgema.org/news/downloads/20100327_liquidity.pdf.

³⁹³ Gai et al., *supra* note 387.

³⁹⁴ Haldane, *supra* note 390.

outside that range, “higher concentration in the network makes the system more susceptible to a systemic liquidity crisis.”³⁹⁵ Furthermore, since concentrated networks are vulnerable to shocks targeting the key players, when the initial shock hits the most connected interbank lender, the likelihood of systemic failure increases.³⁹⁶

3. Evolution of the Modern Financial Network

Given the above conclusions, it is crucial to examine the structure of the modern financial network and its consequent vulnerabilities to systemic risk. The financial network in its current state is the result of an evolution over the past decade that has featured an increase in complexity, concentration, connectedness and homogeneity. From a network theory perspective, such a combination leads to fragility.³⁹⁷

Securitization and derivatives have lengthened the network chains, while also multiplying the number of links between institutions: the network became more complex and more connected. Haldane quantifies this fact, noting that over the past two decades nodes in the financial network have increased fourteen-fold and “links have become fatter and more frequent, increasing roughly six-fold.”³⁹⁸ Furthermore, as firms diversified and engaged risk management strategies that had common characteristics, the diversification of individual firms created less diversity in the aggregate system. The network became more homogenous. Finally, the international finance network displays the characteristics of a fat-tailed network, comprising of a relatively small number of highly connected financial institutions.³⁹⁹

Not only has the structure of the financial network evolved over time, but it is also highly dynamic and cyclical. Interconnectedness throughout the network increases in times of crisis over the level during non-crisis periods.⁴⁰⁰ In particular, Billio et al. quantified the level of interconnectedness through a Granger causality measure that captures the extent to which one

³⁹⁵ Gai et al., *supra* note 387, at 464.

³⁹⁶ *Id.*

³⁹⁷ Haldane, *supra* note 390.

³⁹⁸ *Id.*

³⁹⁹ *Id.*

⁴⁰⁰ Monica Billio, Mila Getmansky, Andrew W. Lo & Lorian Pelizzon, *Measuring Systemic Risk in the Finance and Insurance Sectors* (MIT Sloan School, Working Paper 4774-10, Mar. 2010).

institution's riskiness leads to increased riskiness in other institutions.⁴⁰¹ With connectedness defined as a statistically significant causality relationship between two institutions, they find that interconnections prior to and during the 1998 LTCM crisis (1994-1998) represented 9% of total possible connections, while this dropped to 2% after the crisis subsided.⁴⁰² Interconnections represented 4% for 2002-2006, but doubled during the period leading up to the latest financial crisis at 8%.⁴⁰³

The above combined features of the financial network have resulted in a “robust-yet-fragile” system, whereby the system is well-equipped to absorb most adverse shocks within a given range, but is particularly vulnerable to failure in the case of shocks outside that range (i.e., the system becomes more likely to fail in those cases than it is under alternative structures). Furthermore, in addition to the relative magnitude of the shock, the location of the shock in the network (i.e., hitting a “super-spreader”) can have catastrophic consequences for systemic stability.⁴⁰⁴ This nature of the current network illustrates that “the resilience of the financial system to fairly large shocks prior to 2007 (e.g., 9/11, the Dotcom crash and the collapse of Amaranth to name a few) was not a reliable guide to its future robustness.”⁴⁰⁵ Over the past 15 years a “lengthy period of seeming robustness (the Golden Decade from 1997 to 2007) was punctuated by an acute period of financial fragility.”⁴⁰⁶

In regards to the repo market activity in 2007 and 2008, Gai, Haldane, and Kapadia show how a “seemingly small shock to a limited set of assets which are being used as collateral can lead to a collapse in both secured and unsecured interbank markets.”⁴⁰⁷ They demonstrate that the most dangerous banks from a systemic risk perspective are “those which are both heavily involved in repo activity and big lenders in the unsecured interbank market.”⁴⁰⁸ Banks heavily involved in repo activity were most susceptible to the aggregate haircut shocks in the repo

⁴⁰¹ *Id.*

⁴⁰² *Id.* at 41.

⁴⁰³ *Id.*

⁴⁰⁴ See Prasanna Gai & Sujit Kapadia, *Contagion in Financial Networks*, 466 PROCEEDINGS OF THE ROYAL SOC'Y A 2401 (2010); see also Teruyoshi Kobayashi, *Diversity Among Banks May Increase Systemic Risk* (Working Paper, Aug. 2012).

⁴⁰⁵ Gai & Kapadia, *supra* note 404, at 2403.

⁴⁰⁶ Haldane, *supra* note 390.

⁴⁰⁷ Gai et al., *supra* note 387.

⁴⁰⁸ *Id.*

market, while banks that are important players in interbank lending are more likely to propagate the shock through the system. Because large, complex financial institutions that engage in repo activity are also the important players in interbank lending, it becomes clear how the structure of the network made the financial system vulnerable to collapse.⁴⁰⁹ Furthermore, given the concentration in the tri-party repo market, with Bank of New York Mellon and JPMorgan Chase as the two clearing banks, the network resembles a hub-and-spoke configuration. This structure is a double-edged sword in terms of resilience of the network.⁴¹⁰ Clearing banks serve to eliminate concentration risk and counterparty risk among the repo market participants, but the two clearing banks themselves introduce their own concentration risk to the system. As a result, a shock to either of the clearing banks would certainly constitute a “tipping point” that could have major systemic implications.

4. Asset Interconnectedness and Network Theory

As stated in Part I.A, asset interconnectedness was not a major cause of the financial crisis. The network theory literature supports this conclusion. A simple network structure of asset interconnectedness would be the following: Bank B has direct exposure to Bank A (such as owning debt in Bank A). Bank C has direct exposure to Bank B. If Bank A fails, then the subsequent loss to Bank B through its asset exposure to Bank A causes Bank B to fail. Similarly, Bank C fails due to its asset exposure to Bank B. These failures can permeate throughout the financial system via asset interconnectedness.

Such an asset interconnectedness model of systemic failure has been widely studied and universally rejected as a plausible cause of the financial crisis.⁴¹¹ In this sense, the relatively small shock of subprime losses could be absorbed by the system with no systemic failure. Therefore, the network externalities due to asset connectedness “did *not* pose a serious threat to

⁴⁰⁹ *Id.*

⁴¹⁰ *Id.*

⁴¹¹ Tobias Adrian & Hyun Song Shin, *Liquidity and Financial Contagion*, FIN. STABILITY REV. – SPECIAL ISSUE ON LIQUIDITY (Feb. 2008).

the financial system.”⁴¹² It should be noted that sufficiently large enough shocks could lead to systemic failure through asset interconnectedness, but only at implausibly high levels.⁴¹³

5. Importance of Bank and Non-Bank Financial Institutions

Recent regulation to address systemic risk has focused not only on bank, but also non-bank financial institutions. The consideration of both bank and non-bank financial institutions is certainly warranted from a network perspective, particularly as Chan et al. find that the funding relationships between large banks and hedge funds plays a significant role in the risk of systemic failure.⁴¹⁴ However, recent studies have illustrated the particular systemic importance of the banking sector. Billio et al. studies the interconnectedness among banks, brokers, hedge funds, and insurance companies.⁴¹⁵ Through a variety of measures, they find that “all four sectors have become highly interrelated and less liquid over the past decade, increasing the level of systemic risk in the finance and insurance industries.”⁴¹⁶ They ultimately find that of the four industries examined, banks introduce the most systemic risk to the network: shocks to banks ultimately reach other financial institutions, but the converse is not true.⁴¹⁷ Empirically, they conclude “the banking sector may be a more important source of systemic risk than other parts, which is consistent with the anecdotal evidence from the current financial crisis.”⁴¹⁸ These conclusions suggest that regulation should focus on the particular concern of bank failure, and not simply group banks and non-bank financial institutions together when enacting regulations.

The money market mutual fund industry is also an important source of liability interconnectedness in the financial network that should be considered when considering systemic risk. Prime money market mutual funds (MMMFs) primarily invest in the short-term debt of large global banks. As of May 2012, of the roughly \$1.4 trillion prime MMMF assets, 22% was invested in government-backed securities (Treasuries, Agency securities, or municipal securities)

⁴¹² *Id.* (emphasis in original)

⁴¹³ *Id.*

⁴¹⁴ Nicholas Chan, Mila Getmansky, Shane M. Haas & Andrew Lo, *Do Hedge Funds Increase Systemic Risk?*, FED. RES. BANK OF ATLANTA ECON. REV. (Fourth Qtr. 2006).

⁴¹⁵ Billio et al., *supra* note 400.

⁴¹⁶ *Id.* at 3.

⁴¹⁷ *Id.*

⁴¹⁸ *Id.* at 49.

and only 3% was invested in non-financial firms, while the remaining 75% was invested in the money-market instruments of global banks.⁴¹⁹ For instance, \$56.8 billion was invested in Barclay's short-term obligations, representing 3.99% of all prime MMMF assets.⁴²⁰ Of the top-50 non-government issuers whose obligations are held in in prime MMMF portfolios, 48 are financial institutions.⁴²¹

As substantial investors in the asset-backed commercial paper and secured repos issued by financial institutions, MMMFs play a vital role in funding the financial system and are a major source of liability interconnectedness. A rough estimate of the magnitude of this role is that prime MMMFs are responsible for 25% of the aggregate short-term wholesale funding of large financial firms, where such funding is defined as uninsured domestic deposits, primary dealer repos, and financial commercial paper.⁴²² However, there is not a consensus regarding the importance of MMMFs in funding the global banking system. The ICI estimates that MMMFs only provide roughly 2.4% of total funding (including insured deposits and long-term liabilities) to U.S. banks that have more than \$10 billion in assets.⁴²³ Depending on the extent to which individual banks rely on MMMFs, a collapse of the MMMF industry could eliminate a crucial source of funding, potentially causing funding shortages at these banks that in turn lead them to the brink of collapse. In this way, the liability interconnectedness of the money market mutual fund industry with the rest of the financial system makes MMMFs a potentially large source of systemic risk. However, the question remains as to the degree of reliance of individual systemically important banks on MMMF short-term funding. If no single large bank relies on this funding to a significant degree, then a shock to the MMMFs would likely be absorbed by the rest of the system without devastating effects. A recent Fitch study provides some guidance in this respect. In sampling 45% of total prime U.S. MMMFs, Fitch finds that for Bank of America, JPMorgan, and Citibank, the sampled MMMFs provide 1.6%, 1.5%, and 0.9% of total short-term

⁴¹⁹ David S. Scharfstein, *Perspectives on Money Market Mutual Fund Reforms*, Testimony before the Senate Committee on Banking, Housing, and Urban Affairs, (June 21, 2012).

⁴²⁰ *Id.*, at Exhibit 1.

⁴²¹ *Id.*, at 2.

⁴²² *Id.*, at 2.

⁴²³ Investment Company Institute tabulation of data from June 2012 SEC Form N-MFP and the Federal Reserve Board.

liabilities (total deposits, money market, and short-term funding), respectively.⁴²⁴ A more complete investigation into this firm-level reliance is required to fully evaluate the role that MMMF reform will play in reducing systemic risk.

6. Contagion and Network Theory

The theoretical academic literature has explored two alternative explanations for the cause of a contagious bank run: counterparty risk and liquidity hoarding. The counterparty risk models generally involve a worsening of asymmetric information in which lenders become unable to determine the creditworthiness of borrowers, ultimately leading to a freeze in interbank lending.⁴²⁵ The liquidity hoarding models suggest that institutions engage in precautionary hoarding of liquidity, regardless of the creditworthiness of borrowers, in anticipation of future liquidity. The end result is also a freeze in interbank lending.⁴²⁶ Empirical studies as to which channel best explains the interbank lending freeze in 2007 and 2008 give mixed results. Afonso et al. and Taylor & Williams have linked counterparty risk to the lending freeze.⁴²⁷ On the other side, Acharya & Merrouche and Christensen et al. have linked it to precautionary liquidity hoarding.⁴²⁸ Since many financial institutions are lenders as well as borrowers, the bank runs can have significant network effects.

Once a contagious run occurs, either as a result of counterparty risk or precautionary liquidity hoarding, the network externalities take over. If the run constitutes a shock beyond the financial system's "tipping point," as explained above, contagion combined with liability

⁴²⁴ Fitch Ratings, *U.S. Money Fund Exposure and European Banks: Repos Reflect Caution*, Sept. 28, 2012.

⁴²⁵ See e.g., Mark J. Flannery, *Financial Crises, Payment System Problems, and Discount Window Lending*, 28 J. MONEY, CREDIT & BANKING 804 (1996); Xavier Freixas & Jose Jorge, *The Role of Interbank Markets in Monetary Policy: A Model with Rationing*, 40 J. MONEY, CREDIT & BANKING 1151 (2008); Florian Heider, Marie Hoerova & Cornelia Holthausen, *Liquidity Hoarding and Interbank Market Spreads: The Role of Counterparty Risk* (Eur. Banking Ctr. Discussion Paper No. 2009-11S, Center Discussion Paper Series No. 2009-40S, 2009).

⁴²⁶ See e.g., Franklin Allen, Elena Carletti & Douglas Gale, *Interbank Market Liquidity and Central Bank Intervention*, 56 J. MONETARY ECON. 639 (2009); Ricardo J. Caballero & Arvind Krishnamurthy, *Collective Risk Management in a Flight to Quality Episode*, 63 J. FIN. 2195 (2008).

⁴²⁷ Gara Afonso, Anna Kovner & Antoinette Schoar, *Stressed, Not Frozen: The Federal Funds Market in the Financial Crisis*, 66 J. FIN. 1109 (Aug. 2011); John Taylor & John C. Williams, *Further Results on a Black Swan in the Money Market* (SIEPR Discussion Paper No. 07-46, May 2008).

⁴²⁸ Viral Acharya & Ouarda Merrouche, *Precautionary Hoarding of Liquidity and Inter-bank Markets: Evidence from the Sub-prime Crisis* (NYU, Working Paper No. FIN-09-018, 2010); Jens H.E. Christensen, Jose A. Lopez & Glenn D. Rudebusch, *Do Central Bank Liquidity Facilities Affect Interbank Lending Rates?* (Fed. Res. Bank of San Francisco Working Paper Series, Paper No. 2009-13, June 2009).

interconnectedness could result in systemic failure. As illustrated by Gai et al., once liquidity hoarding enters the system, the structure of the network plays a “critical role” in its propagation to other institutions.⁴²⁹ In this sense, network theory confirms that contagion in interbank lending accelerates crises as “network robustness decays” when the intensity of contagion increases.⁴³⁰

Since Lehman was not a major funder in the interbank lending system, it is unlikely that the Lehman failure itself constituted a “tipping point.” However, as explained in Part III, contagion did spread and lead to runs and liquidity hoarding. It is then possible that this liquidity hoarding spread through the network via the interbank linkages, whereby the network dynamics contributed to the spreading.

C. Policy Initiatives to Address Interconnectedness

1. Central Clearing

a. Benefits

Central clearing of certain derivatives and other financial contracts has the potential to reduce both the likelihood and magnitude of interconnectedness. With exposure guaranteed by a central clearing counterparty (CCP), whose sole business is to stand in between and thereby assume the credit risk of buyers and sellers, Duffie (2010) and Duffie, Li, and Lubke (2010) conclude that market participants will have reduced incentives to flee from a weak counterparty.⁴³¹ By making “counterparty runs” less likely, clearing might forestall the failure of a weak financial institution.⁴³² And if a financial institution does collapse, Duffie and Zhu (2010) find that “[e]ffective clearing mitigates systemic risk by lowering the risk that defaults propagate from counterparty to counterparty.”⁴³³ Indeed, as indicated by the experience of counterparties holding centrally cleared derivatives against Lehman, who suffered no losses from the

⁴²⁹ Gai et al., *supra* note 387.

⁴³⁰ Xiaoyang Sean Dong, *Network Contagion in Financial Crisis* (Working Paper, June 2012)

⁴³¹ Duffie, *supra* note 149, at 67; *see* Duffie, Li & Lubke, *supra* note 149, at 11.

⁴³² *See* Duffie, Li & Lubke, *supra* note 149, at 11; *see also* Darrell Duffie & Haoxiang Zhu, *Does a Central Clearing Counterparty Reduce Counterparty Risk?* 2 (2010), <http://www.stanford.edu/~duffie/DuffieZhu.pdf> (noting that “[c]learing also reduces the degree to which the solvency problems of a market participant are suddenly compounded by a flight of its OTC derivative counterparties”).

⁴³³ Duffie & Zhu, *supra* note 432.

investment bank's collapse,⁴³⁴ central clearing can completely insulate market participants from losses associated with the default of a dealer.

Central clearing may also be helpful in addressing liability interconnectedness, to the extent the presence of clearinghouses reduces complexity and lowers the value of interbank connections in a financial network. However, the introduction of the clearinghouse will alter the configuration of the network, and further research is warranted into the potential effects of these changes. In addition, central clearing may help to reduce contagious runs. Clearing brings a new degree of transparency to the OTC derivatives markets, which, during a crisis, could reduce panic among market participants who would otherwise remain in the dark about potential exposures and risks faced by their own counterparties. At the same time though, reporting of trades to centralized data repositories could also serve this purpose.

Given the potential—and actual—risk-reducing effects of central clearing, it is not a surprise that Dodd-Frank mandates central clearing in certain instances, a policy the Committee on Capital Markets Regulation advocated in its March 2010 letter to members of the Senate Banking Committee and House Financial Services Committee.⁴³⁵ Specifically, swaps and security-based swaps between financial entities that are not being used to hedge commercial risk must be cleared if the relevant regulatory body (the CFTC for swaps and the SEC for security-based swaps) so determines.⁴³⁶ In making this determination, the regulators are instructed to examine, *inter alia*, contract liquidity, operational capacity, and the effect of clearing on the mitigation of systemic risk.⁴³⁷ Thus, the more standardized a contract is, the more likely it is to be subject to mandatory clearing. Conversely, contracts that are not standardized will likely not have to be cleared.

⁴³⁴ See *supra* text accompanying notes 256-262.

⁴³⁵ Letter from the Comm. on Capital Mkts. Reg. to Christopher Dodd, Chairman, Richard Shelby, Ranking Member, S. Comm. on Banking, Housing & Urban Affairs and Barney Frank, Chairman, Spencer Bachus, Ranking Member, H. Fin. Servs. Comm. (Mar. 4, 2010), http://www.capmksreg.org/pdfs/10-Mar-4_Committee_Derivatives_Letter.pdf.

⁴³⁶ See Dodd-Frank Act §§ 723(a), 763(a).

⁴³⁷ *Id.*

b. Limitations

While CCPs would not be prevented from clearing non-standardized derivatives, they might not have the capacity to since they “can handle only derivatives with relatively standard terms.”⁴³⁸ Herein lies a limitation of CCPs—they are ill-suited to deal with all derivatives, namely, highly customized contracts that are difficult to value and manage. For example, AIG’s notorious CDS portfolio on multi-sector CDOs discussed in Part I.B.2.c.iii would probably not be clearable.⁴³⁹ One might argue that this simply illustrates that customized derivatives unable to be cleared should be banned. Yet, as the Treasury has recognized, customized derivatives can play a “legitimate and valuable role.”⁴⁴⁰ However, the current level of customization may be excessive insofar as it stems not from true customer demand, but rather from the economic incentives of dealers to resist standardization.⁴⁴¹

Yet even if all contracts were standardized and subject to clearing, systemic risk would not be entirely eliminated and, under certain circumstances, could increase. As derivatives are increasingly centrally cleared, CCPs themselves will become systemically important financial institutions, with some perhaps growing too big to fail.⁴⁴² As Fed Chairman Bernanke has observed, “[T]he flip side of the centralization of clearing and settlement activities in clearinghouses is the concentration of substantial financial and operational risk in a small number of organizations, a development with potentially important systemic implications.”⁴⁴³

Not only is the counterparty risk that dealers offload to clearinghouses assumed by CCPs, but this risk transfer may not be one-for-one. Rather, the nature of the transfer will depend on the

⁴³⁸ Duffie, *supra* note 149, at 67.

⁴³⁹ *See id.*

⁴⁴⁰ Neal S. Wolin, Deputy Secretary, U.S. Dep’t of the Treasury, Remarks at the International Swaps and Derivatives Association 25th Annual Meeting (Apr. 22, 2010), <http://www.treasury.gov/press-center/press-releases/Pages/tg656.aspx>.

⁴⁴¹ *See id.* (noting that “the large OTC dealers simply do not have a sufficient incentive to speed up the process of standardization”); *see also* Duffie, Li & Lubke, *supra* note 149, at 10 (noting that “[e]ven after an OTC derivatives product has achieved relatively active trading, and would be suitable for exchange trading, dealers have an incentive to maintain the wider bid-ask spreads that they can obtain in the OTC market relative to the spreads that might apply to the same product on an exchange”).

⁴⁴² *See* Duffie, Li & Lubke, *supra* note 149, at 8; Manmohan Singh, *Making OTC Derivatives Safe—A Fresh Look* 10-11 (Int’l Monetary Fund, Working Paper No. 11/66, Mar. 2011), <http://www.imf.org/external/pubs/ft/wp/2011/wp1166.pdf>.

⁴⁴³ Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Res. Sys., Remarks at the 2011 Financial Markets Conference: Clearinghouses, Financial Stability, and Financial Reform 2 (Apr. 4, 2011), <http://www.federalreserve.gov/newsevents/speech/bernanke20110404a.pdf>.

extent to which market participants can net exposure across assets and parties, which in turn will depend on the number and nature of CCPs. In particular, as Duffie and Zhu (2010) explain, the introduction of a CCP for a particular asset class will be risk reducing only “if the opportunity for multilateral netting in that class dominates the resulting loss in bilateral netting opportunities across uncleared derivatives from other asset classes.”⁴⁴⁴ In other words, by using a CCP for an asset class, market participants obtain the benefit of netting in the asset class across parties (multilateral netting) but lose the benefit of netting against another party outside the asset class (bilateral netting).

To understand this, it is useful to consider a simple example proffered by Duffie and Zhu.⁴⁴⁵ Suppose Dealer A has \$100 million of CDS exposure to Dealer B while Dealer B has \$150 million of interest rate swap exposure to Dealer A. Through bilateral netting, Dealer B would have \$50 million of exposure to Dealer A as its \$150 million of interest rate swap exposure would be partially offset by its -\$100 million of CDS exposure. But if Dealers A and B move their CDS to a CDS clearinghouse, Dealer B’s exposure to Dealer A will jump to \$150 million (the amount of its interest rate swap exposure) as it loses the ability to net its interest rate swap exposure against its CDS exposure. However, if Dealer B has \$100 million of CDS exposure to Dealer C and Dealer C also transfers its CDS to the clearinghouse, Dealer B will obtain \$100 million of multilateral netting benefits from the clearinghouse (its net CDS exposure will be \$0). In this case, therefore, multilateral netting benefits from the CDS clearinghouse will exactly offset the lost bilateral netting benefit between Dealers A and B, suggesting that here the clearinghouse is neither risk reducing nor risk increasing. Yet if Dealer C also has \$100 million of CDS exposure to Dealer A, multilateral netting benefits from the CDS clearinghouse will exceed lost bilateral netting benefits (as all three dealers will have \$0 in net CDS exposure), assuming that Dealers A and C have no other exposure to each other. In this case, then, the clearinghouse can be considered efficient.

While the preceding example highlights the tradeoff between multilateral netting in a particular asset class and bilateral netting across asset classes, one might wonder why there needs to be a tradeoff in the first place. Indeed, there would not necessarily be as striking a tradeoff if a

⁴⁴⁴ Duffie & Zhu, *supra* note 432, at 3.

⁴⁴⁵ *See id.*

CCP itself netted multiple asset classes or CCPs each netting one (different) asset class were linked to one another in a manner allowing netting across asset classes. However, at present, this “first-best” solution does not exist.⁴⁴⁶ Moreover, even if CCPs, on their own or through linkages, could provide multilateral netting across asset classes, they still might not be efficient because dealers would retain counterparty exposure from derivatives that could not be cleared and thus, the transfer of positions to clearinghouses could still reduce bilateral netting benefits (from the netting of clearable and non-clearable derivatives between parties). That is, whether or not they enable multilateral netting across asset classes, as long as CCPs do not clear *all* derivatives, they might not reduce risk, and as noted above, there are at least some derivatives that CCPs are ill-equipped to clear.

Furthermore, even if the reduction of counterparty risk outweighs lost netting benefits, derivative participants will lose the initial margin as source of funding, since it would be posted instead to the CCP. As a result, banks will likely seek alternative sources of short-term funding to offset such a funding loss. While this may leave the banks still exposed to contagion it will decrease the risk of interconnectedness. In addition to the lost initial margin, the increased central clearing of derivative products will also cause an increase in demand for the safe collateral that must be posted to the CCP. Studies have estimated that demand for such collateral could increase by \$5 trillion as a result of swaps moving to central clearing parties.⁴⁴⁷ The increased demand for collateral that results from central clearing, combined with a reduced supply as estimated by the International Monetary Fund (IMF) (a reduction of \$4.2 trillion since 2007), would likely lead to rising costs of safe collateral, and hence rising funding costs for financial institutions.⁴⁴⁸

The foregoing discussion is not meant to suggest that CCPs are therefore of negligible value. Rather, as the preceding section emphasized, central clearing can play a significant role in mitigating systemic risk. Moreover, in the words of Fed Chairman Bernanke, “[c]learinghouses around the world generally performed well in the highly stressed financial environment of the

⁴⁴⁶ See Singh, *supra* note 442, at 5.

⁴⁴⁷ See Dominic Hobson, *Collateral Makes the World Go Around...*, FIN. NEWS, Sept. 3, 2012.

⁴⁴⁸ *Id.*

recent crisis.”⁴⁴⁹ Nonetheless, it is important to realize that central clearing is not without its own problems and that it cannot, on its own, completely eliminate systemic risk.

2. Exposure Limitations under Dodd-Frank

Another policy initiative aimed at addressing systemic risks posed by interconnectedness is the single-counterparty credit concentration limits required by Dodd-Frank. Banks commonly monitor and limit their exposures to individual counterparties. This is not a new concept; for example, banks have long been subject to state and federal banking laws that limit the amount a bank can extend in credit to a single borrower to a percentage of the bank’s capital. Section 165 of Dodd-Frank requires the Federal Reserve to establish limits to prevent covered companies from having credit exposures to any unaffiliated company that exceeds 25% of the capital stock and surplus of the covered company. Congress also gave the Federal Reserve the ability to lower this limit if it determines such a lower limit to be “necessary to mitigate risks to the financial stability of the United States.”⁴⁵⁰ In January 2012, the Federal Reserve proposed rules to implement this provision of Dodd-Frank as part of its Enhanced Prudential Standards.⁴⁵¹ It did in fact choose to lower the counterparty exposure threshold to 10% for entities with greater than \$500 billion in consolidated assets.

While the potential benefits of limiting counterparty exposure seem uncontroversial, the implementation of this provision through the Federal Reserve’s regulations poses numerous challenges. First, the 25% limit may also be overly generous or scant depending on the counterparty. Critics of the proposed rules also cite the Fed’s method of calculating counterparty exposure as extremely narrow and out of line with common practice, inconsistent with the approach the Fed itself has taken in other contexts. It is also not clear what these limits add to the widespread industry practice of imposing these limits out of a desire to limit risk. As pointed out in the Committee on Capital Market Regulation’s comment letter regarding the proposed rules, the Federal Reserve has not explained why a 10% restriction for large banks is more appropriate than a 25% limitation, particularly given the potential increase in interconnectedness as large

⁴⁴⁹ Bernanke, *supra* note 443.

⁴⁵⁰ Dodd-Frank Act §165(e).

⁴⁵¹ Enhanced Prudential Standards and Early Remediation Requirements for Covered Companies, 77 Fed. Reg. 594 (proposed January 5, 2012).

banks are required to “spread their exposures across more and smaller, potentially less stable counterparties.”⁴⁵² Many entities who will be subject to this lower limit have voiced their concerns that the 10% limitation will have a significant impact on the way they conduct business. The Committee has also expressed concern with the lack of exemption for a bank’s exposure to central clearing parties, which works at cross-purposes with the Dodd-Frank central clearing requirements.⁴⁵³ There are also widely-voiced objections to the lack of any carve-out for foreign sovereign debt from the exposure limitations. However, these implementation issues lie outside the scope of this paper. While exposure limitations have the potential to address systemic risk posted by interconnectedness, these limitations do not provide a solution to contagion.

3. Minimization of Concentration

A third policy initiative that could potentially address interconnectedness involves efforts to break up concentration in the banking industry. Concentration as we have seen poses particular risks in the context of liability interconnectedness, where a handful of banks provide a significant percentage of the short-term liquidity in the financial system. Although none of these systemically important banks failed during the financial crisis, there has been broad criticism that these entities remain “too big to fail” and pose intolerable risk. During the recent debate over implementation of the Volcker Rule, this issue rose to the forefront as certain critics argued the Volcker Rule’s requirement that banking entities shed their proprietary trading and fund investing businesses does not go far enough. These critics would go one step further and advocate a return to Glass-Steagall and a complete separation of commercial and investment banking activities.⁴⁵⁴

Limiting the size of banking entities presents significant challenges. Large banks benefit from economies of scale and their diverse business lines can mitigate risk and help them to better

⁴⁵² Comm. on Capital Mkts. Reg. comment letter to the Federal Reserve regarding Enhanced Prudential Standards and Early Remediation Requirements for Covered Companies, 77 Fed. Reg. 594 (Docket No. 1438, RIN 7100 – A86), Apr. 30, 2012.

⁴⁵³ *Id.*

⁴⁵⁴ See e.g., *Hearing on the TARP’s Impact on Financial Stability Before the Cong. Oversight Panel*, 112th Cong. (Mar. 4, 2011) (statement of Simon Johnson, Prof., MIT Sloan School of Mgmt.); Jesse Hamilton & Kathleen Hays, *Glass-Steagall Return Would Boost Banks, FDIC’s Hoenig Says*, BLOOMBERG, June 26, 2012, <http://www.bloomberg.com/news/2012-06-26/glass-steagall-revival-would-bolster-banks-fdic-s-hoenig-says.html>.

withstand specific shocks. In addition, the ability of commercial and investment banks to co-exist in the same entity proved to be of critical importance during the financial crisis, allowing for example JP Morgan to acquire Bear Stearns. Again however, the specifics of this debate lie beyond the scope of this paper. Suffice it to say that even if banks were split up or limited in size, such a limitation on its own would not solve the problem of systemic risk posed by contagion. An alternative approach of limiting short-term funding within banks, discussed below in more detail, could potentially address the issue of contagion without requiring specific additional limitations on the size of banking entities or the scope of their activities. Furthermore, for banks that provide vital operational functions, including custody and settlement, break-up may not be the ideal solution for reasons discussed above, but a “handoff” plan in the case of failure would be crucial for ensuring seamless continuation of these services.

II. Contagion

A. Descriptions of Contagion

1. Overview and History

The problem of contagion is longstanding in the regulation of financial institutions and the design of stable financial systems.⁴⁵⁵ Today, it is again commanding the attention of regulators, policymakers, central bankers, and market participants.⁴⁵⁶ The term “contagion” denotes the spread of run-like behavior from one financial institution to an expanding number of other (not necessarily interconnected or even related) financial institutions, causing an across-

⁴⁵⁵ See, e.g., MILTON FRIEDMAN & ANNA J. SCHWARTZ, A MONETARY HISTORY OF THE UNITED STATES 1867-1960 at 299-419 (1963) (discussing the role of contagion in U.S. banking crises of the early 1930s) [hereinafter FRIEDMAN & SCHWARTZ]; MILTON FRIEDMAN & ANNA J. SCHWARTZ, THE GREAT CONTRACTION 1929-1933 (1965); Alan Greenspan, Chairman, Bd. of Governors of the Fed. Reserve Sys., Remarks at the VIIIth Frankfurt International Banking Evening (May 7, 1996), http://fraser.stlouisfed.org/historicaldocs/852/download/28572/Greenspan_19960507.pdf (warning of the consequences to the contemporary financial system of a contagious “chain reaction” of institutional failures in a period of financial crisis).

⁴⁵⁶ See, e.g., Press Release, Bank for Int’l Settlements, Committee on Payment and Settlement Systems, Central Bankers Call for Action to Tackle Potential Contagion in the Global Financial Infrastructure (June 4, 2008), <http://www.bis.org/press/p080604.htm>; Bank for Int’l Settlements, *The Interdependencies of Payment and Settlement Systems* (June 2008), <http://www.bis.org/publ/cpss84.pdf>.

the-board reduction in the aggregate amount of funding available to the financial system.⁴⁵⁷ This behavior can also spread to short-term capital markets that fund the complex and growing assortment of non-depository financial institutions in the financial system. The effects of “market contagion” were displayed prominently during the financial crisis of 2007-2009 in asset-backed commercial paper (ABCP) markets, interbank unsecured borrowing markets, secured repo markets, among prime money market mutual funds (MMMFs), and to a limited extent within areas of the non-financial U.S. and international economy that had direct financial linkages to commercial paper markets.

The special feature that distinguishes contagion (in any format, market segment, or economic arena) from other major causes of systemic instability in the financial system is the possibility for contagious runs to propagate among institutions and in markets *indiscriminately*. Contagion is indiscriminate when it afflicts healthy, solvent institutions and markets rather than only dysfunctional or insolvent ones.⁴⁵⁸ Financial institutions (including even prime MMMFs) are vulnerable to contagion because they depend on short-term borrowing to fund their longer-term investment activity, e.g., loans in the case of banks and finance companies. If investors in short-term debt instruments suddenly become unwilling to extend funding continuously to the financial system, these institutions might fail.

Although contagion is closely linked with, and usually culminates in, run behavior by short-term creditors, run behavior may be rational or irrational. Importantly, not all runs involve indiscriminate contagion. Under certain circumstances, a run by short-term creditors can be informed, rational, and targeted to a single or limited number of financial institutions, for example, ones that become known to have incurred significant losses.⁴⁵⁹ During a run that acquires contagious attributes, however, investors might also choose to withdraw funding from *multiple* institutions or markets that are *not* already the subject of runs and are *not* facing grave

⁴⁵⁷ See George Kaufman, *Bank Contagion: Theory and Evidence* (Fed. Reserve Bank of Chicago, June Working Paper Series, WP-92-13, June 1992),

http://www.chicagofed.org/digital_assets/publications/working_papers/1992/WP-92-12.pdf. “Panic,” a popular and historical term that is substantially synonymous with contagion, will be used interchangeably throughout this paper.

⁴⁵⁸ See Ted Temzelides, *Are Bank Runs Contagious?*, FED. RESERVE BANK OF PHILADELPHIA BUS. REV., Nov.-Dec. 1997, at 3-14, <http://www.philadelphiafed.org/research-and-data/publications/business-review/1997/november-december/brnd97tt.pdf>.

⁴⁵⁹ *Id.* at 4-6.

business distress. In this environment, the decision to exit is not made on the basis of specific information, but because investors possess insufficient information to differentiate their risks from those that others are, or appear to be, facing. This dynamic, one central banker has warned, may “lead to failures of other financial intermediaries, even when [they] have not invested in the same risks and are not subject to the same original shocks.”⁴⁶⁰ If these intermediaries fund themselves using short-term capital instruments, the manifestation of contagion effects may spread to the markets where these instruments trade. Sudden demand for liquidity by investors in intermediaries like MMMFs that normally hold these instruments, e.g., commercial paper, or a refusal on the part of interbank lenders to renew their funding, can trigger liquidations or freeze-ups in these markets that induce fire sales, cripple asset prices, and halt lending activity.

The two parts that follow, II.A.2 and II.A.3, elaborate on the overarching distinction between systemic risk that is linked to the business cycle (due both to correlation and connectedness risk), on the one hand, and to contagion, on the other. After surveying the impact that business cycle risk can exert on financial institutions (Part II.A.2), this study then considers the distinctive structural attributes shared between classic depository banking activity and contemporary financial intermediation, most notably the joint dependency of both activities on short-term borrowing, which render them equally susceptible to contagious runs to which the non-financial, non-short-term-funded economy is substantially invulnerable (Part II.A.3). Part II.A.4 next discusses the extension of contagion during the financial crisis of 2007-2009 to non-depository financial intermediaries and the short-term capital markets, before turning to consideration of strategies for counteracting it in Parts II.B.1, II.B.2 and II.B.3.

2. Contagion or Selective Withdrawals?

Financial historians disagree about how much responsibility to assign to contagion effects for the periodic disruption to the U.S. financial system recorded over the past two centuries. Some analysts believe that worsening economic conditions may cause depositors to take their money out of weak banks and put it into healthy ones.

⁴⁶⁰ Jean-Claude Trichet, Pres., Eur. Cent. Bank, Text of the Clare Distinguished Lecture in Economics and Public Policy (Dec. 10, 2009), http://www.ecb.int/press/key/date/2009/html/sp091210_1.en.html (analyzing the linkage between systemic risk and contagion).

A study of the Chicago Banking Panic of 1932 by Calomiris and Mason (1997) arrives at this conclusion, showing that most bank failures were the result of homogenous balance sheets impairments caused by the collapse in asset prices after the onset of the Depression.⁴⁶¹ This finding is striking given the tight geographic focus of the panic and its feverish atmosphere, in which some 40 Chicago-area banks failed, including 26 in only seven days during June 1932.⁴⁶² Although these characteristics appear to resemble a classic bank run, the authors reject this interpretation, insisting instead that most of the banks that did succumb were “distinguishable months before the panic,”⁴⁶³ the evidence of their preexisting mass insolvency “reflected in stock prices, failure probabilities, the opinions of bank examiners, debt composition, and interest rates.”⁴⁶⁴ Calomiris and Mason further find, by contrast, that solvent banks did not fail during the Chicago Panic.⁴⁶⁵ Part of the explanation for the sharply differentiated performance of solvent banks may be that these healthy banks were able to supplement lost deposits by coordinating private interbank lending facilities, to which insolvent institutions did not have access.⁴⁶⁶ The systematically different experiences of solvent and insolvent banks are held to illustrate that the wave of failures in Chicago, and in certain other instances⁴⁶⁷ during the Depression, was driven by an exogenous shock to asset prices in the context of an adverse economy. The effect of this shock brought about a system-wide adjustment in the allocation of funding that destabilized insolvent institutions, yet contagion effects for the most part were not implicated.

On a similar note, certain studies that examined the externalities of the Lehman failure have concluded that the collapse of Lehman and AIG were not direct causes of the financial crisis that ensued. For example, Taylor, in studying LIBOR-OIS spreads as a proxy for counterparty risk in the financial system, found that in the five days following the Lehman

⁴⁶¹ Charles Calomiris & Joseph Mason, *Contagion and Bank Failures During the Great Depression: The June 1932 Chicago Banking Panic*, 87 AM. ECON. REV. 863, 881 (Dec. 1997), <http://www.jstor.org.ezp-prod1.hul.harvard.edu/stable/pdfplus/2951329.pdf> (finding “failures during the [Chicago] panic reflected relative weakness of failing banks in the face of a common asset value shock rather than contagion”).

⁴⁶² *Id.* at 865. In total there were forty-nine bank failures in Illinois in June 1932. *Id.*

⁴⁶³ *Id.* at 881.

⁴⁶⁴ *Id.*

⁴⁶⁵ *Id.* at 864.

⁴⁶⁶ *Id.* at 864, 868-69 (noting that “at least one solvent bank” was saved from failing through the assistance of the Chicago clearing house banks).

⁴⁶⁷ Charles Calomiris, *Bank Failures in Theory and History: The Great Depression and Other “Contagious” Events* 25 (Nat’l Bureau of Econ. Research, Working Paper No. 13597, Nov. 2007), <http://www.nber.org/papers/w13597> (arguing that “panics played a small-role in [1930s] Depression-era distress”).

failure, spreads increased only modestly.⁴⁶⁸ He concluded that the failure of Lehman and AIG per se did not cause an immediate breakdown of the system; rather, what severely worsened the situation was the government policy that followed. The spreads shot up to unprecedented levels only after Friday September 19, 2008, the day when TARP was announced. Cochrane and Zingales held the same view.⁴⁶⁹ Besides LIBOR-OIS spreads, they also looked at the CDS spread for Citigroup around the week of the Lehman event and found it to behave similarly. This suggests investors did not panic about Citigroup immediately after the Lehman failure, but rather they became much more concerned about the health of large financial institutions after the TARP announcement and Henry Paulson's and Ben Bernanke's testimony before Congress. However, this view is not without opposition. Sterling argued that Taylor's, Cochrane's, and Zingales's results are based on an incomplete set of financial market condition indicators.⁴⁷⁰ Using the Bloomberg Financial Conditions Index, which incorporates a broader set of indicators, Sterling showed that the Lehman failure was an immediate and massive shock to an already stressed financial system.

The U.S. commercial bank JPMorgan Chase (JPMorgan) was apparently a prime beneficiary of this kind of funding transfer during the financial crisis of 2007-2009, as retail customer deposits⁴⁷¹ and prime brokerage assets⁴⁷² flowed out of weakened commercial and investment banking institutions and into JPMorgan's insured deposit and prime brokerage accounts. Writing in his annual letter in 2009, Jamie Dimon, JPMorgan's chief executive officer, advised shareholders that JPMorgan received a net *inflow* of depositor funds as investors fled lower-quality institutions during the crisis. "As we entered the most tumultuous financial markets since the Great Depression," Dimon wrote, "we experienced the opposite of a 'run on

⁴⁶⁸ John Taylor, *The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong* (Nat'l Bureau of Econ. Research, Working Paper No. 14631, Nov. 2008).

⁴⁶⁹ John Cochrane & Luigi Zingales, *Lehman and the Financial Crisis*, WALL ST. J., Sept. 15, 2009.

⁴⁷⁰ William Sterling, *Looking Back at Lehman: An Empirical Analysis of the Financial Shock and the Effectiveness of Countermeasures*, 57 MUSASHI UNIV. J. (Nov. 2009).

⁴⁷¹ See JPMorgan Chase, Letter to Shareholders, Annual Report, at 28 (2009), http://files.shareholder.com/downloads/ONE/1017247059x0x362440/1ce6e503-25c6-4b7b-8c2e-8cb1df167411/2009AR_Letter_to_shareholders.pdf.

⁴⁷² *The Run on Morgan Stanley*, FT.COM/ALPHAVILLE, Sept. 18, 2008, <http://ftalphaville.ft.com/blog/2008/09/18/16082/the-run-on-morgan-stanley> (reporting that JPMorgan "[was] thought" to have received \$40 billion in prime brokerage inflows in the two days following the bankruptcy of Lehman Brothers).

the bank’ as deposits flowed in (in a two-month period, \$150 billion flowed in—we barely knew what to do with it).”⁴⁷³

Some historians trace the frequency of bank failures in U.S. history to an abnormally high level of concentration risk that was promoted by the decentralized structure of the U.S. banking system. This was a product of a restructuring of the American banking industry during the National Banking Era stimulated by distinctive legislative changes in the United States that were not duplicated in other national economies.⁴⁷⁴ According to this account, branching restrictions embodied in the National Bank Act of 1864 propelled a thirteen-fold increase in the total number of U.S. banks over the next fifty years. By 1914, the unprecedented expansion and decentralization of banking institutions in the United States had culminated in a unit banking system comprising 22,030 institutions nationally.⁴⁷⁵ The massive proliferation of small banks managing localized loan portfolios created concentration risks that may have rendered many small banks acutely sensitive to the impact of an economic downturn, exacerbating the overall failure rate within the system (it is also plausible, however, that in other circumstances localization could lower correlation to generalized economic effects).⁴⁷⁶ These small banks may also have suffered from poorer management relative to their more sophisticated larger peers. This literature is an interesting counterpoint to those seeking smaller banks.

Countries in which the banking system did not develop pervasive decentralized characteristics did not face repeated waves of financial panic. In Canada, for example, where banking activity assumed a more consolidated format, bank failures were rare events, even though the Canadian macroeconomic environment tracked the U.S. experience:⁴⁷⁷ between 1870 and 1913, Canadian banks underwent 23 liquidations, compared with 3,208 recorded in the United States in the same period. No banks failed in Canada between 1923 and 1985, but

⁴⁷³ JPMorgan Chase, Letter to Shareholders, *supra* note 471.

⁴⁷⁴ Stephen Williamson, *Bank Failures, Financial Restrictions, and Aggregate Fluctuations: Canada and the United States, 1870–1913*, FED. RESERVE BANK OF MINNEAPOLIS Q. REV., Summer 1989, http://www.minneapolisfed.org/publications_papers/pub_display.cfm?id=218.

⁴⁷⁵ RICHARD S. CARNELL, JONATHAN R. MACEY & GEOFFREY P. MILLER, *THE LAW OF BANKING AND FINANCIAL INSTITUTIONS* 11 (4th ed. 2008).

⁴⁷⁶ Williamson, *supra* note 474, at 3 (finding that banks subject to a unit banking restriction are less diversified, “more sensitive to idiosyncratic shocks, and...experience runs and fail with higher probability”).

⁴⁷⁷ *Id.* at 3-6, 13-19.

between 1930 and 1933 alone, 9,000 U.S. banks suspended operations.⁴⁷⁸ Such discrepancies are not attributable to the variance in the performance of the Canadian and U.S. economies, but may trace to the dramatic differences in the shape of industry consolidation across the two systems.⁴⁷⁹ On the other hand, the different bank failure rates across the two systems might also be the result of any number of other political, regulatory, and social factors distinguishing the Canadian and U.S. environments from each other during the Depression. The link drawn to industry consolidation is provisional only.

Studies of selected bank failures in the 1970s and 1980s yield at best only mixed evidence attesting to the presence of contagion effects.⁴⁸⁰ More recently, some scholars and finance professionals have minimized the role of contagion in the unfolding of the financial crisis of 2007-2009. Wolf (2008), while not neglecting the effects of contagion, assigns primary blame for the crisis to asset shocks and macroeconomic instabilities linked to long-term international imbalances in global trade, savings rates, and investment.⁴⁸¹ At the microeconomic level, Dumontaux and Pop (2010) scrutinized the impact on financial institutions of the bankruptcy of Lehman Brothers on September 15, 2008, determining that contagion effects, to the extent any existed at all, were “firm-specific, rational and discriminating rather than industry-wide-specific, ‘pure’ panic-driven or undifferentiated.”⁴⁸² Like the bank failures in the 1932 Chicago panic, firms that were affected the most by the collapse of Lehman, the authors argue, possessed comparable core business characteristics, operating fundamentals, and a performance record that was measurably correlated with Lehman’s.⁴⁸³ Appraising the totality of the evidence,

⁴⁷⁸ *Id.* at 5; see also FRIEDMAN & SCHWARTZ, *supra* note 455, at 352-53 (discussing absence of runs on Canadian banks during the Depression and its impact on the money supply).

⁴⁷⁹ Williams, *supra* note 474, at 19 (noting that “Canada had a branch banking system, with few banks compared to the U.S. unit banking system”); see also Temzelides, *supra* note 458, at 8 (discussing Williamson’s findings).

⁴⁸⁰ Joseph Aharony & Itzhak Swary, *Contagion Effects of Bank Failures: Evidence from Capital Markets*, 56 J. BUS. 305 (1983), <http://www.jstor.org.ezp-prod1.hul.harvard.edu/stable/pdfplus/2352800.pdf>.

⁴⁸¹ See generally MARTIN WOLF, *FIXING GLOBAL FINANCE* (2008).

⁴⁸² Nicolas Dumontaux & Adrian Pop, *Contagion Effects in the Aftermath of Lehman’s Collapse: Measuring the Collateral Damage* 14 (Dec. 2009), http://gdre_mbf_2010.u-bordeaux4.fr/sites/gdre_mbf_2010/IMG/pdf/dumontaux_pop.pdf.

⁴⁸³ *Id.* at 15.

Dumontaux and Pop conclude that the effects of Lehman’s failure on financial institutions were neither indiscriminate nor contagious.⁴⁸⁴

As is discussed in more detail below, however, several important U.S. financial firms that arguably possessed considerably stronger business models, such as Morgan Stanley and Goldman Sachs, do appear to have been affected by some degree of run behavior after the failure of Lehman, an apparent qualification attached to these findings. Scott (2011) notes that, though “[s]ignificant bank runs were not a feature of the financial crisis,” important *non*-bank financial institutions, beginning with the investment bank Bear Stearns, and later spreading to critical segments of the short-term capital markets, did undergo serious runs.⁴⁸⁵ Further, although no significant financial institution sharing Lehman’s basic business attributes collapsed as a result of Lehman’s failure, quite importantly, this may reflect the bailout signal transmitted by the federal government’s subsequent intervention to preempt the disorderly unwinding of AIG as well as by the multifaceted public support programs instituted by the U.S. Treasury and the Federal Reserve⁴⁸⁶ (described below), not the absence of contagion. In fact, analysis in Part II.A.4 finds evidence of substantial contagion effects on display elsewhere in the financial system at the “market” level. These effects were transmitted initially through the Reserve Primary Fund to other prime MMMFs, among certain segments of the asset-backed, financial, and even corporate commercial paper markets, and to unsecured interbank lending markets and secured repo borrowing markets. Ultimately, they resulted in serious runs on other investment banks (for example, through the prime brokerage units of Goldman Sachs, Morgan Stanley, and Merrill Lynch) as investor confidence in the vitality of the independent investment banking business model deteriorated. These findings, which are reviewed below, collectively represent a challenge to Dumontaux and Pop’s conclusions.

Managers of financial institutions that survived the crisis continue to urge that their firms were safely positioned and would not have become subject to the type of run that contributed to the dismantling of Bear Stearns and Lehman Brothers. Top executives at Goldman Sachs, for

⁴⁸⁴ *Id.* at 15-16 (calling the “market reaction to Lehman’s failure...selective and well-informed, rather than random and indiscriminate”).

⁴⁸⁵ Scott, *How to Improve Five Important Areas of Financial Regulation*, *supra* note 4, at 117-18.

⁴⁸⁶ For a summary, see HAL S. SCOTT & ANNA GELPERN, *INTERNATIONAL FINANCE* 42-82 (18th ed. 2011).

example, have repeatedly emphasized that Goldman was adequately capitalized to withstand the failure of major counterparties, including AIG. This claim, however, relates more to the nature of Goldman's interconnectedness to its counterparties and the adequacy of the collateral it held against its positions with AIG, than to its vulnerability to a generalized financial panic, manifested through a run of its short-term creditors.⁴⁸⁷ Absent additional evidence to support the claim, it is equally plausible that the bailout signal established by rescuing AIG forestalled broader panic in markets to which Goldman was and would have been exposed. As described above, JPMorgan experienced substantial net inflows of guaranteed retail deposits and non-guaranteed prime brokerage assets during the crisis, emerging from the collapse of Lehman Brothers with strengthened liquidity reserves and enhanced share and competitive positioning in the retail, commercial, and investment banking markets. Finance professionals perhaps have a rational incentive to understate the degree to which their firms are susceptible to contagious market forces outside their control and to overstate the role played by defective risk management policies and exposure to low-quality assets in the prominent institutional failures of the crisis. This incentive is illustrated by Alan Schwartz, formerly chief executive officer of Bear Stearns, in his televised assurances to the marketplace in March 2008 that market rumors about Bear's decaying liquidity were untrue, even though a "cash crunch" was apparently already underway when he made these remarks.⁴⁸⁸

3. Contagious Failure: The Run-Panic Theory

The best-developed theory of systemic risk attributes the prototypical financial panic to run behavior by short-term creditors that spreads across multiple institutions in the financial system. Depositors withdraw from all banks, indiscriminately, based on the existence of asymmetric information.

Various attempts have been made to explain what factors induce short-term creditors of a previously stable financial institution to initiate a run in the first place. Diamond and Dybvig have suggested that the "shift in [creditor] expectations" can "depend on almost anything,"

⁴⁸⁷ Goldman Sachs Group, Inc., Business Update Conference Call Transcript (Mar. 20, 2009).

⁴⁸⁸ Andrew Fisher, *Bear Stearns CEO: No Liquidity Crisis for Firm*, CNBC, Mar. 12, 2008, http://www.cnbc.com/id/23590249/Bear_Stearns_CEO_%C2%A0_No_Liquidity_Crisis_for_Firm.

whereas Gorton attributes it to a change in the business cycle.⁴⁸⁹ Scott (2010) describes contagious run behavior as originating from a lack of timely market information.⁴⁹⁰ Social-psychology models such as Bikhchandani, Hirshleifer, and Welch (1992) characterize financial panics as one instance of a more general form of crowd behavior documented in non-financial contexts too. This view imputes contagion effects to “informational cascades” in which individual market participants use the actions of peers as cost-effective surrogates for actual data about an underlying reference entity that might otherwise be prohibitively expensive to obtain.⁴⁹¹ All of these explanations recognize that contagion is not preconditioned on prior insolvency of a bank. Instead, it is a liquidity-driven phenomenon that reflects the maneuvering of short-term creditors in response to informational constraints, rational incentives, and structural vulnerabilities uniquely characteristic of financial intermediaries dependent on short-term borrowing. These constraints can provoke short-term creditors to withdraw from institutions preemptively even if they are fundamentally well-capitalized and have no exposure to losses connected to an asset shock, such as occurred during the financial crisis of 2007-2009 in MMMFs that did not own debt issued by Lehman Brothers (described in Part II.A.4).

Applied to classic banking activity, contagion theory historically focused on runs by uninsured depositors to explain the wave of bank failures of the 1930s and elsewhere in modern financial history. The underlying economic explanation for a contagious run extends, however, to the behavior of non-deposit short-term creditors too, as is described in II.A.4.⁴⁹² Contagion can spread indiscriminately to solvent institutions, causing “real economic problems because even ‘healthy’ banks can fail.”⁴⁹³ Financial institutions that succumb to contagion may be solvent immediately beforehand and may not display characteristic warning signs of distress, for

⁴⁸⁹ Douglas W. Diamond & Philip H. Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 24 FED. RESERVE BANK OF MINNEAPOLIS Q. REV. 14 (2000), <http://minneapolisfed.org/research/QR/QR2412.pdf>; Gary Gorton, *Banking Panics and Business Cycles*, 40 OXFORD ECON. PAPERS 751 (1988).

⁴⁹⁰ SCOTT & GELPERN, *supra* note 486, at 26.

⁴⁹¹ See, e.g., Sushil Bikhchandani et al., *A Theory of Fads, Fashion, Custom, and Cultural Change as Informational Cascades*, 100 J. POL. ECON. 992, 1012-13 (Oct. 1992) (comparing the initiation of a bank run to “a cascade in which small depositors fear for the solvency of a bank and act by observing the withdrawal behavior of other depositors”); see also CHARLES P. KINDLEBERGER, *MANIAS, PANICS, AND CRASHES: A HISTORY OF FINANCIAL CRISES* 38, 145 (5th ed. 2005).

⁴⁹² See, e.g., Morgan Ricks, *Shadow Banking and Financial Regulation* 13 (Columbia Law and Econ., Working Paper No. 370, Aug. 30, 2010) (extending the economic explanation for run behavior to the so-called shadow banking system).

⁴⁹³ Diamond & Dybvig, *supra* note 489.

example a decline in operating performance or deterioration in balance sheet quality, for regulators to detect in advance.⁴⁹⁴ Importantly, contagion in the financial system and runs on individual financial institutions within it are two different phenomena, though they are closely related to each other. An isolated run by short-term investors on a single financial institution is not an example of contagion. Contagion only occurs when a run at one institution or some other event induces short-term creditors of multiple other institutions to run too, even from institutions that are adequately capitalized and may have no financial linkage to the same set of problematic risk exposures.⁴⁹⁵ Nonetheless, the two phenomena are linked because under certain circumstances individual runs can generate systemic contagion effects that are then translated into further runs. Crucially, runs that mutate into contagious panics are not always, and do not need to be, preceded by the actual failure of one or more distressed or insolvent financial institutions. On the contrary, contagion can develop from a generalized fear of failure on the part of short-term creditors as much as it can represent an overt reaction to specific cases of real distress. Financial institutions are vulnerable to contagion following the drying up of short-term funding markets since they, unlike non-financial companies, can be brought down by runs of this kind.

The basic economic explanation for how contagion unfolds is rooted in classic bank run behavior, articulated in the model of bank runs developed by Diamond and Dybvig (1983). This model establishes that banks, and equally any other financial institution that serves as an intermediary to a maturity transforming transaction by issuing short-term debt, exist at “multiple equilibria.” Because maturity transformation requires the intermediary to finance long-term illiquid assets (such as mortgages with maturities spanning multiple decades)⁴⁹⁶ with short-term or demand liabilities that are redeemable at par, one of these equilibria is a run:

Banks are able to transform illiquid assets by offering liabilities with a different, smoother pattern of returns over time than the illiquid assets offer. These contracts have multiple equilibria. If confidence is maintained, there can be efficient risk sharing, because in that equilibrium a withdrawal will indicate that a depositor should withdraw under optimal risk sharing. If agents panic, there is a

⁴⁹⁴ *Id.* at 410.

⁴⁹⁵ See Scott, *How to Improve Five Important Areas of Financial Regulation*, *supra* note 4, at 114.

⁴⁹⁶ Markus K. Brunnermeier, *Deciphering the Liquidity and Credit Crunch 2007–2008*, 23 J. ECON. PERSP. 77, 79 (Winter 2009).

bank run and incentives are distorted. In that equilibrium, everyone rushes in to withdraw their deposits before the bank gives out all of its assets. The bank must liquidate all its assets, even if not all depositors withdraw, because liquidated assets are sold at a loss.⁴⁹⁷

The core of this account is constructed around what some commentators have labeled a “collective action” problem:⁴⁹⁸ short-term creditors of a maturity-transforming firm that is suspected to be verging on insolvency develop a rational motive to withdraw funding before the firm’s supply of liquid reserves is drained by others who are responding to the same pattern of incentives. Generating enough liquidity to redeem exiting creditors at par forces the firm into monetizing long-term assets at non-economic valuations. In the ensuing fire sale, the bank incurs actual losses, thus realizing the concern that had caused creditors to panic in the first place. Even though all short-term creditors would *collectively* be served better by remaining invested and seeking to maximize their recoveries through an orderly disposition of long-term assets (accompanied by a wind-down of operations) conducted over a longer time period, each *individually* has a strong incentive to be first to exit, rather than risking potentially more severe impairment as a result of a fire sale. A downward spiral at one firm becomes contagious when it induces short-term creditors of other firms to develop symmetrical concerns and incentives, initiating a chain reaction of distressed liquidations that ultimately engulfs healthy financial institutions, drives down asset prices below fair market valuations, and causes systemic balance sheet impairment both through forced sales and mark-to-market accounting losses.⁴⁹⁹

Runs on bank- and non-bank financial institutions can develop into contagion even if the institutions are initially well capitalized and display no leading indicators of financial distress. As this begins to occur, fire sales initiated by affected institutions to (1) fund withdrawals of liquidity, (2) post margin, or (3) cover defaults by counterparties through the liquidation of

⁴⁹⁷ Diamond & Dybvig, *supra* note 489, at 403. *See also* Gerald Corrigan, Fed. Reserve Bank of Minneapolis, *Are Banks Special* (Jan. 1982), <http://www.minneapolisfed.org/pubs/ar/ar1982a.cfm> (noting that “[o]nly banks issue transaction accounts; that is, they incur liabilities payable on demand at par and are readily transferable by the owner to third parties”).

⁴⁹⁸ CARNELL ET AL., *supra* note 475, at 310 (characterizing uninsured depositors as “fac[ing] a collective action problem of the sort game theorists call the *prisoner’s dilemma*”); *see also* Ricks, *supra* note 492, at 13.

⁴⁹⁹ *See, e.g.*, Scott, *The Reduction of Systemic Risk in the United States Financial System*, *supra* note 1, at 674-75 (describing the prototypical depositor-initiated contagious run and linking it to the broader problem of systemic risk in the financial system); Andrei Shleifer & Robert Vishny, *Fire Sales in Finance and Macroeconomics*, 25 J. ECON. PERSP. 29 (Winter 2011); Temzelides, *supra* note 458, at 5.

collateral⁵⁰⁰ cause asset prices to fall, impairing institutional balance sheets, depleting capital, and driving institutions into the state of insolvency anticipated by short-term creditors when the runs began. As Friedman and Schwartz (1963) observe, at this point the run may become “self-justifying” since the fire sale “force[s] a decline in the market value of...the remaining assets” held on institutional balance sheets, which in the worst cases brings about actual insolvency.⁵⁰¹ Shleifer and Vishny (2011) point out that collapsing asset prices can also force financial institutions to recognize mark-to-market accounting losses, compounding the insolvency effect of the runs.⁵⁰² Institutions that are initially untouched by contagion can thus be brought down by large mark-to-market accounting losses that wipe out capital even if those institutions have not participated in the fire selling and their balance sheet losses remain unrealized.⁵⁰³

The fire sales that accompany a serious run can help to explain why ex ante strategies like capital requirements, which seek to stop the development of contagion by preventing financial institutions from becoming insolvent and failing, might be unable to overcome the dynamics that initiate and sustain a contagious run that unfolds independently of an institution’s solvency. Greenwood et al. have recently developed a model of the systemic effects of fire sales, distinguishing and measuring (a) “aggregate vulnerability,” the financial-sector-wide impact caused by fire sales, (b) “systemicness,” the separate impact of the liquidation of an individual financial institution on the aggregate value of the financial sector, and (c) “vulnerability,” the impact of shocks on each individual institution.⁵⁰⁴ Importantly, this explanatory and predictive framework suggests that a firm’s “systemicness,” rather than its direct exposure to an asset shock, should inform policy responses.

Contagion presents a systemic risk of a singular nature to financial institutions, going beyond what their industrial counterparts confront.⁵⁰⁵ Even critics such as Kaufman (1992) who

⁵⁰⁰ Shleifer & Vishny, *supra* note 499, at 37 (discussing the impact of margin requirements and collateral liquidations on fire sales).

⁵⁰¹ FRIEDMAN & SCHWARTZ, *supra* note 455, at 355 (reporting that “impairment in the market value of assets held by banks, particularly in their bond portfolios, was the most important source of impairment of capital leading to bank suspensions, rather than the default of specific loans or of specific bond issues [of the early 1930s]”).

⁵⁰² Shleifer & Vishny, *supra* note 499, at 29-30.

⁵⁰³ *Id.*

⁵⁰⁴ Robin Greenwood et al., *Vulnerable Banks* 1 (Working Draft, Nov. 2011), http://www.newyorkfed.org/research/conference/2011/global_sys_risk/vulnerable_banks18.pdf.

⁵⁰⁵ Kaufman, *Bank Contagion: Theory and Evidence*, *supra* note 457, at 3.

urge that contagion is an overstated force in financial markets concede that, compared to other industries, it (1) strikes financial institutions more often, unfolding more rapidly than in other sectors of the economy, (2) spreads among a larger constellation of peer institutions, (3) causes a larger number of failures, and (4) spills over to the real economy where it inflicts collateral damage on industries that depend on the financial sector as a source of long-term capital.⁵⁰⁶ Above all, since contagion is a structural feature of the financial system that is endogenous to the economics of maturity transformation, it is not likely to be resolved through better risk management or improved prudential oversight. Policymakers should not take too much comfort from the fact that past bank failures may have been driven by fluctuation in the business cycle, correlation, concentration, or interconnectedness. Absent affirmative, systematic steps taken to contain it, the problem of contagion will continue to haunt the financial system for the future.

Historical experience supplies evidence that the problem of contagion is not hypothetical. The seminal review of the banking panics of the early 1930s by Friedman and Schwartz concludes that instability during this period exhibited salient hallmarks of contagion.⁵⁰⁷ Saunders and Wilson (1996) present evidence to support their conclusions.⁵⁰⁸ Gorton concurs that the disruptions in the banking system at the outset of the Depression differed in foundational aspects from mass insolvencies during the National Banking Era, and can be attributed to structural weaknesses intrinsic to banking institutions and the banking system.⁵⁰⁹ Senior U.S. policymakers point to the role of contagion in the financial crisis of 2007-2009. Federal Reserve chairman Ben Bernanke, though pointing to “fundamentals” including massive balance sheet impairments linked to losses from residential and commercial mortgage lending that “played a critical role in triggering” the crisis, has also reserved room for the decisive effects of what he has called “classic panic” at play among non-bank financial institutions and MMMFs, in interbank

⁵⁰⁶ *Id.*

⁵⁰⁷ FRIEDMAN & SCHWARTZ, *supra* note 455, at 308-15 (describing a “contagion of fear spread[ing] among depositors” beginning in 1929).

⁵⁰⁸ Anthony Saunders & Berry Wilson, *Contagious Bank Runs: Evidence from the 1929–1933 Period*, 5 J. FIN. INTERMEDIATION 409 (1996) (researching the 1930–1933 period and finding some evidence of contagion, but attributing much of the bank crisis to the impact of economic deterioration).

⁵⁰⁹ Gorton, *supra* note 489, at 752.

unsecured lending markets, as well as in repo and ABCP markets during September and October of 2008.⁵¹⁰

More exacting scrutiny is needed to establish the scale of the problem of contagion in the financial institutional context. The portrait of financial institutions that has been developed here, however, indicates that contagious runs are endemic to all issuers of short-term uninsured debt instruments acting as credit intermediaries in the process of maturity transformation. If this portrait is accurate, then strategies to contain financial contagion must go beyond promoting greater loss imposition (e.g., through capital requirements and resolution procedures) and controlling risk-taking by institutions in the financial system, and must address the structural source of this recurring hazard, the importance of short-term funding, facing credit intermediaries to ensure we have an adequate toolkit to fight contagion when it does occur.

4. Financial Contagion as a Market Phenomenon

a. Non-Depository Financial System: Money Market Mutual Funds and Commercial Paper

Until recently the bulk of attention devoted to contagion focused on its effects upon the depository banking system and upon demand deposits, the principal source of short-term credit to that system.⁵¹¹ The evolution of financial linkages in the economy over the past 30 years and growing intermediation of financial markets via derivatives, asset securitization, and structured finance have introduced a new universe of credit intermediaries to the financial system and a new range of short-term credit markets that supply them, as well as banks, with non-deposit wholesale funding.⁵¹² Collectively, the non-bank financial institutions serve largely the same economic role as the conventional banking system, as Gorton (2009) and many others have noted.⁵¹³ Like traditional depository institutions, many of these intermediaries conduct maturity

⁵¹⁰ Ben S. Bernanke, Chairman, Fed. Reserve Bd., Remarks at the Federal Reserve Bank of Kansas City's Annual Economic Symposium, Jackson Hole, Wyo. (Aug. 21, 2009), <http://www.federalreserve.gov/newsevents/speech/bernanke20090821a.htm>.

⁵¹¹ Ricks, *supra* note 492, at 3.

⁵¹² For discussion of the increasing complexity in the contemporary financial system and its role in the financial crisis of 2007–2009, see, for example, SCOTT & GELPERN, *supra* note 486, at 704-91.

⁵¹³ Gary Gorton, *Slapped in the Face by the Invisible Hand: Banking and the Panic of 2007*, at 43 (Yale and Nat'l Bureau of Econ. Research, May 2009), <http://www.frbatlanta.org/news/CONFEREN/09fmc/gorton.pdf> (concluding that “[r]eforms to the current system must address the reality of [the] shadow banking system as a banking system”).

transformation (or intermediate the process of maturity transformation through ownership of short-term liabilities issued by other maturity transforming firms) and are financed on a short-term or demand basis by wholesale sources. Unlike depository institutions, however, they do not take deposits. Non-bank financial intermediaries fund themselves in a variety of short-term secured and unsecured borrowing markets, including the markets for commercial paper, ABCP, unsecured interbank lending, and secured repo borrowing. The major buyers of the money market instruments (including ABCP and repo) issued into these markets are 2(a)-7 MMMFs, unregulated investment funds, and various securities lenders.⁵¹⁴ The contemporary collection of non-bank financial institutions, credit intermediaries, and short-term capital and money markets that ultimately provide funding to them are sometimes referred to as the “shadow banking system”⁵¹⁵ (or the “securitized” banking system),⁵¹⁶ but as Scott (2011) observes, this term is imprecise and designates different activities, actors, and markets at different times.⁵¹⁷ That said, these new sources of funding are important to the financial system.

Among the most important attributes distinguishing the system of non-bank institutional intermediaries from traditional depository banking activity is its substantially greater level of intermediation. Classic banking conventionally involves a single intermediary (a bank) that originates long-term loans and issues short-term deposit accounts or other funds. By contrast, non-bank institutional credit creation often entails multiple layers of intermediation, resulting in the creation of greater amounts of short-term liabilities to finance assets held by intermediaries at each layer.⁵¹⁸ For example, Pozsar (2010) characterizes at least seven representative stages in the process of originating, warehousing, and funding long-term assets. Each stage involves the participation of different categories of non-bank financial institutions, each of which is funded in

⁵¹⁴ See also Zoltan Pozsar et al., *Shadow Banking* 11-14 (Fed. Reserve Bank of N.Y. Staff Report No. 458, Jul. 2010), http://www.newyorkfed.org/research/staff_reports/sr458.pdf.

⁵¹⁵ The term “shadow banking system” is attributed to Paul A. McCulley, managing director at PIMCO. It has since been widely adopted by the financial press. Paul A. McCulley, *Teton Reflections*, PIMCO (Sept. 2007); see also Pozsar et al., *supra* note 514.

⁵¹⁶ Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo* (Yale ICF Working Paper No. 09-14, Nov. 2010), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1440752.

⁵¹⁷ Scott, *How to Improve Five Important Areas of Financial Regulation*, *supra* note 4, at 117.

⁵¹⁸ Hyun Song Shin, *Macroprudential Policies Beyond Basel III* at 8 (Int’l Ctr. for Fin. Reg., Research Prize 2010, 2010), <http://www.icffr.org/getdoc/3fa60720-1232-4d7d-8da6-0dcc3d0e9632/ICFR-FT-Research-Prize-2010-Hyun-Song-Shin---winni.aspx>.

a number of different wholesale markets.⁵¹⁹ In the first stage, loan origination is conducted by non-bank finance companies funded in the commercial paper markets (and by longer-term notes).⁵²⁰ Loans are subsequently warehoused in a variety of funding conduits financed using ABCP before undergoing securitization through SPVs created by broker-dealers (stages 2-3).⁵²¹ Next, the asset-backed securities (ABS) created from the securitization process are warehoused temporarily on broker-dealer trading books funded with short-term secured repo (stage 4) and structured into asset-backed or synthetic CDOs (stage 5).⁵²² They may undergo further intermediation through structured investment vehicles (SIVs), credit hedge funds, and other conduits funded in the repo and ABCP markets and by longer-term bond markets (stage 6).⁵²³ Finally, the collection of commercial paper, ABCP, and repo funding issued to finance various stages in the intermediation process are absorbed by wholesale funding markets through regulated 2(a)-7 MMMFs, unregulated enhanced cash funds, and direct investors in money markets, among other cash investors.⁵²⁴ Longer-term liabilities created in the process may be purchased by mutual funds, pension funds, and other long-term investors.⁵²⁵

Though the actual number of steps in the intermediation of financial assets varies (for example, depending on the quality of the assets being financed at the origination stage),⁵²⁶ the economic outcome of the process is almost the same as in the depository banking context: long-term assets, including residential and commercial mortgages, auto loans, credit card loans, and corporate bank debt, ultimately are converted to short-term debt instruments such as commercial paper. These instruments often incorporate exceptionally short maturities. In 2008, for example, 69% of total outstanding commercial paper was one to four days maturity and 75% was nine days or less.⁵²⁷ As Shin (2010) observes, proliferating shorter liability maturities are the direct result of lengthening intermediation chains, since “[a]t each stage of the intermediation chain, the

⁵¹⁹ Pozsar et al., *supra* note 514, at 11.

⁵²⁰ *Id.* at 12.

⁵²¹ *Id.*

⁵²² *Id.*

⁵²³ *Id.* at 13; *see also* SCOTT & GELPERN, *supra* note 486, at 714-17 (describing the steps in the process of creating of a CDO).

⁵²⁴ Pozsar et al., *supra* note 514, at 13.

⁵²⁵ *Id.* at 13.

⁵²⁶ *Id.* at 14.

⁵²⁷ Richard G. Anderson & Charles S. Gascon, *The Commercial Paper Market, the Fed, and the 2007–2009 Financial Crisis*, FED. RES. BANK OF ST. LOUIS REV. 589, 590 (Nov./Dec. 2009), <http://research.stlouisfed.org/publications/review/09/11/Anderson.pdf>.

funding interest rate must be lower than the asset interest rate,” creating demand for “more short-term funding...to support the chain.”⁵²⁸ Apart from the involvement of multiple layers of intermediation and the creation of increasing amounts of short-term liabilities, the primary difference in the non-bank style of credit creation relative to depository banking is that the ultimate sources of financing to the origination process are the capital markets: short-term commercial paper markets including ABCP, unsecured and secured repo borrowing markets, plus the markets for bonds and other long-term capital instruments. MMMFs dominate the buy-side of the market for the shorter maturity instruments (commercial paper, ABCP, and repo) issued through this process.

Unlike traditional bank deposits in the United States, these liabilities are uninsured, though as Wermers (2010) notes, “some investors seem to believe that implicit guarantees [of MMMFs] exist, either from the management company or from the U.S. Government.”⁵²⁹ But since they serve an equivalent function in transforming short-term maturities indirectly into longer-term capital, they are subject to the identical collective action problems, liquidity issues, and run risks that historically have attached only to uninsured bank deposits.⁵³⁰ Since the fundamental economic role served by non-depository, non-bank financial intermediaries, including MMMFs, exposes them to periodic runs, they are also vulnerable to contagion. Importantly, due to the liability interconnectedness of MMMFs discussed in Part I.B.5, this vulnerability extends to major commercial and investment banking institutions that are dependent on uninsured wholesale funding to support their business models. Non-deposit funding is not only crucial to investment banks that have become bank holding companies, like Goldman Sachs and Morgan Stanley, but also important to traditional commercial banks (*see* Figure 2.1).

⁵²⁸ Shin, *supra* note 518, at 9.

⁵²⁹ Russ Wermers, *Money Fund Runs* 1 (Sept. 2010) (noting that “[i]n the eyes of some investors, money market funds have become a substitute for bank deposits”); *see also* Ricks, *supra* note 492, at 4 (noting that “the short-term financing sources on which [the system of MMMFs and other credit intermediaries] relies are the functional equivalent of bank deposits”); *see also* Gorton, *supra* note 513, at 30 (arguing that “[r]epo is essentially depository banking, built around informationally-insentive debt”).

⁵³⁰ Ricks, *supra* note 492, at 3-6, 9-11; *see e.g.*, Brooke Masters & Jeremy Grant, *Finance: Shadow Boxes*, FIN. TIMES, Feb. 2, 2011 (defining and describing “shadow banking” and noting that “[s]ome non-banks...engage in what is known as ‘maturity transformation’...[s]ometimes...within a single institution but...also...in long chains that encompass everything from mortgage brokers and packagers of loans into securities, to the money market funds and special-purpose vehicles that hold them”).

Figure 2.1: U.S. Commercial and Investment Banks Summary of Assets and Liabilities at Year End 2008⁵³¹
\$ millions

	JPMorgan	Citigroup	Bank of America	Wells Fargo	Goldman Sachs	Morgan Stanley
Balance sheet date	12/31/2008	12/31/2008	12/31/2008	12/31/2008	11/28/2008	11/30/2008
Total assets	\$2,175,052	\$1,945,263	\$1,817,943	\$1,309,639	\$884,547	\$658,812
Liabilities:						
Deposits	\$1,009,277	\$774,185	\$882,997	\$781,402	\$27,643	\$42,755
Secured repo ^(a)	192,546	205,293	206,598	62,203	118,626	129,749
CP and other short-term	37,845	126,691	158,056	45,871	52,658	10,483
Non-deposit short-term	230,391	331,984	364,654	108,074	171,284	140,232
Trading account, derivative, brokerage, and other ^(b)	166,878	238,452	87,996	--	429,815	245,112
Accrued expenses and other ^(c)	187,978	90,275	36,952	53,921	23,216	16,445
Other ^(d)	142,961	--	--	--	--	--
Long-term debt	270,683	359,593	268,292	267,158	168,220	163,437
Total liabilities	2,008,168	1,794,489	1,640,891	1,210,555	820,178	607,981
Shareholders' equity	166,884	150,774	177,052	99,084	64,369	50,831
Total liabilities and equity	\$2,175,052	\$1,945,263	\$1,817,943	\$1,309,639	\$884,547	\$658,812
Non-deposit short-term debt % assets	10.6%	17.1%	20.1%	8.3%	19.4%	21.3%
% as of Year End 2010	14.7%	14.0%	13.5%	4.4%	28.5%	23.6%

(a) Includes federal funds purchased and sold, securities borrowed, loaned, or sold under repurchase agreements, plus other collateralized borrowings.

(b) Includes trading and derivative liabilities, payables to customers, counterparties, brokers, dealers, and clearing services.

(c) Includes reserves for unfunded lending commitments, allowances for credit losses, and other payables.

(d) For JPMorgan includes borrowings associated with the Federal Reserve AML facility.

Because short-term instruments including ABCP, other commercial paper, and various forms of repo financing, the byproducts of the process outlined above, are issued into and exchanged within capital markets, they too can directly experience, or else provide a conduit for, the systemic spread of contagion effects. The basis for this vulnerability is not that short-term capital markets and their direct participants such as MMMFs unilaterally perform all of the functions of traditional banks, or conduct maturity transformation singlehandedly. MMMFs, in fact, often hold short-term, marketable instruments in the form of assets, such as commercial paper and repo borrowing, incurring little maturity mismatch. But these and other instruments

⁵³¹ See JPMORGAN CHASE, 2008 ANNUAL REPORT (FORM 10-K); CITIGROUP INC., 2008 ANNUAL REPORT (FORM 10-K); BANK OF AMERICA CORPORATION, 2008 ANNUAL REPORT (FORM 10-K); WELLS FARGO & CO., 2008 ANNUAL REPORT (FORM 10-K); GOLDMAN SACHS, 2008 ANNUAL REPORT (FORM 10-K); MORGAN STANLEY, 2008 ANNUAL REPORT (FORM 10-K).

that are commonly traded in the short-term capital markets are ultimately issued to finance, and thus are indirectly backed by, an array of non-bank financial institutions that *collectively* provide traditional banking functions to the economy, including maturity and liquidity transformation and loan origination that is conducted in an intermediated format.⁵³² Sudden withdrawals by investors from MMMFs and other short-term capital markets instruments can thus eliminate a vital source of funding to originators positioned further up the intermediation chain. As a result of this liability interconnectedness (i.e., financial institutions' reliance on MMMFs as a source for short-term funding), contagious runs on MMMFs can spread to the banks that rely on this funding, potentially causing a run on the banks themselves. Not only does this MMMF domino effect illustrate the amplifying effect of liability interconnectedness on contagion, but it also highlights the particular importance of MMMF regulatory solutions (discussed below in Part II.B.1.b.iv, Part II.B.1.b.v and Part II.B.1.c).⁵³³ Such runs can also potentially trigger forced liquidations of assets that then depress prices, encourage further fire sales, impede new investment, and, ultimately, damage the overall level and pace of economic activity.

The downward spiral in asset prices can become self-reinforcing, if impairment to the creditworthiness of originators situated “upstream” prompts successive waves of withdrawals by investors in MMMFs and short-term instruments positioned “downstream,” whose recoveries are linked to the solvency of the originators (and the value of the assets they have created). As in the traditional banking context, this cycle is provoked through the combination of maturity mismatch (perhaps disguised temporarily through the intermediation of maturity transformation) and fire sales. The link between the short-term capital markets and traditional credit creation means that the problem of contagion is now a market phenomenon. Taken together the size of these markets eclipses the sum of insured deposits outstanding in the U.S. financial system. Estimates of the total amount of non-deposit banking liabilities outstanding within the financial system range from \$11 trillion⁵³⁴ to \$16 trillion.⁵³⁵ At the end of 2008, money market funds alone managed

⁵³² Pozsar et al., *supra* note 514, at 11-14, 58-59.

⁵³³ For a discussion of the concerns about banks' reliance on MMMF funding and other “flighty” sources of capital, see Paul Tucker, Deputy Governor for Fin. Stability, Bank of England, Remarks at the European Commission High Level Conference: Shadow Banking: Thoughts for a Possible Policy Agenda (Apr. 27, 2012).

⁵³⁴ Ricks, *supra* note 492, at 11.

⁵³⁵ Pozsar et al., *supra* note 514, at 5.

\$3.8 trillion in assets,⁵³⁶ as against \$4.8 trillion of deposits insured by the Federal Deposit Insurance Corporation (FDIC) at traditional U.S. depository institutions.⁵³⁷ The broadening of the parameters of the systemic risk presented by contagion is confirmed further by its visible influence on the behavior of ABCP, interbank, and repo borrowing markets and on MMMFs during the financial crisis of 2007-2009, discussed below. For these reasons, the search for strategies to block the spread of contagion in a crisis period must not neglect the market dimension.

The influence of contagion on non-depository credit intermediaries and money markets has been succinctly documented by Federal Reserve chairman Ben Bernanke in a speech in 2009 that noted the extension of “classic panic” behavior to the non-deposit-taking segment of the financial system during the crisis:

[Classic] [p]anics arose in multiple contexts last year. For example, many financial institutions, notably including the independent investment banks, financed a portion of their assets through short-term repo agreements...As we saw last fall, when a vicious funding spiral of this sort is at work, falling asset prices and the collapse of lender confidence may create financial contagion [in repo markets], even between firms without significant counterparty relationships. In such an environment, the line between insolvency and illiquidity may be quite blurry...Panic-like phenomena occurred in other contexts as well. Structured investment vehicles and other asset-backed programs that relied heavily on the commercial paper market began to have difficulty rolling over their short-term funding very early in the crisis, forcing them to look to bank sponsors for liquidity or to sell assets. Following the Lehman collapse, panic gripped the money market mutual funds and the commercial paper market...More generally, during the crisis runs of uninsured creditors have created severe funding problems for a number of financial firms. In some cases, runs by creditors were augmented by other types of “runs”—for example, by prime brokerage customers of investment banks concerned about the funds they held in margin accounts. Overall, the role played by panic helps to explain the remarkably sharp and sudden intensification of the financial crisis last fall, its rapid global spread, and the fact that the abrupt deterioration in financial conditions was largely unforecasted by standard market indicators.⁵³⁸

⁵³⁶ Baba et al., *supra* note 372, at 65, 68.

⁵³⁷ FED. DEPOSIT INS. CORP., 2008 ANNUAL REPORT 12, 53 (June 2009), http://www.fdic.gov/about/strategic/report/2008annualreport/index_pdf.html.

⁵³⁸ Bernanke, Remarks at the Federal Reserve Bank of Kansas City's Annual Economic Symposium, *supra* note 510.

The bankruptcy of Lehman Brothers in September 2008, though less destructive than some who regarded the firm as “too interconnected to fail”⁵³⁹ had predicted at the outset as discussed in Part I,⁵⁴⁰ produced significant contagion effects in the short-term capital markets. Lehman’s collapse triggered a major run on U.S. MMMFs and short-term ABCP markets after the \$62.6 billion Reserve Primary Fund (RPF) recorded unprecedented write-downs on \$785 million of unsecured Lehman commercial paper instruments.⁵⁴¹ The RPF episode bore trademark signs both of a targeted run (on the RPF and other managers with direct exposure to Lehman, such as Wachovia’s investment management business, Evergreen Investments)⁵⁴² and broader contagion among non-bank financial institutions and markets with no direct exposure to Lehman. Contagion effects spread from the MMMFs to the ABCP market, interbank lending markets including the market for unsecured LIBOR borrowing and secured repo, and to other areas of the non-depository banking system.⁵⁴³

On the day Lehman filed in U.S. bankruptcy court, the RPF received redemption requests from investors amounting to approximately \$25 billion in total.⁵⁴⁴ To satisfy these requests the RPF liquidated its portfolio and wrote down its Lehman holdings to zero, momentarily “breaking the buck” as its NAV fell to \$0.97.⁵⁴⁵ Like in a classic bank run, sudden demand for immediate liquidity from investors forced the RPF into a disorderly liquidation of assets, crystallizing actual losses whose imagination prompted investors to rush to exit in the first place. By September 19, investors demanded redemptions totaling \$60 billion from the RPF.⁵⁴⁶ Other MMMFs that belonged to the Reserve fund family, for example its “U.S. Government Fund,” experienced significant withdrawals “even though they had not broken the buck and had no investments in Lehman paper.”⁵⁴⁷ Unlike the flood of deposits to risk-free accounts issued by JPMorgan, the

⁵³⁹ See, e.g., *Interconnectedness*, *supra* note 85, at 4-5.

⁵⁴⁰ See also *Derivatives Market Trades on Sunday to Cut Lehman Risk*, REUTERS, Sept. 14, 2008, <http://www.reuters.com/article/idUSN1444498020080914> (quoting Bill Gross PIMCO predicting that Lehman’s bankruptcy risked “immediate tsunami” associated with the liquidation of derivatives and CDS positions by counterparties).

⁵⁴¹ ICI MONEY MARKET REPORT, *supra* note 376, 59 (Mar. 2009).

⁵⁴² FCIC REPORT, *supra* note 26, at 354 (noting that “[i]nvestors pulled out of funds with known exposure to that jeopardy, including... Wachovia’s Evergreen Investments”).

⁵⁴³ See *infra* Part I.B.5.

⁵⁴⁴ INV. CO. INST., *supra* note 541, at 59.

⁵⁴⁵ *Id.* at 60.

⁵⁴⁶ Baba et al., *supra* note 372, at 72.

⁵⁴⁷ See *id.*; see *supra* Part I.B.5.

RPF's safest (though not risk-free) funds underwent *outflows*. At least 36 of the largest 100 U.S. prime MMMFs managed by 20 different firms faced a decline below the \$1.00 NAV level and required sponsor support.⁵⁴⁸ As of September 18, \$142 billion of institutional investment money had been withdrawn from prime funds (amounting to 16% of prime MMMF holdings).⁵⁴⁹ Individuals had withdrawn an additional \$27 billion (3% of holdings).⁵⁵⁰ As of the end of the week, a total \$300 billion of investment in prime MMMFs had been liquidated by investors.⁵⁵¹ Although prime MMMFs had already begun to reduce investment in commercial paper prior to Lehman's failure, shifting funds into risk-free U.S. government securities, they continued to hold "about 40% of their assets in commercial paper and corporate notes, with about 25% of their assets in bank notes and certificates of deposit (CDs)." As MMMF investment continued to shift out of commercial paper instruments and into risk-free government securities, "the flight...stressed commercial paper...markets, causing second-tier thirty-day commercial paper rates to double within two days."⁵⁵²

Appetite for commercial paper contracted severely, with annual average daily issuance volume plummeting from approximately \$150 billion per day in 2008 to under \$100 billion in 2009.⁵⁵³ The contraction in commercial paper was sustained across all segments of the market, with the sharpest declines seen in asset-backed and financial commercial paper outstanding (see Figure 2.2 for seasonally adjusted figures).⁵⁵⁴

⁵⁴⁸ Eleanor Laise, 'Breaking the Buck' Was Close for Many Money Funds, WALL ST. J., Aug. 10, 2010, <http://online.wsj.com/article/SB10001424052748703428604575419812292841830.html>.

⁵⁴⁹ Baba et al., *supra* note 372, at 72.

⁵⁵⁰ *Id.*

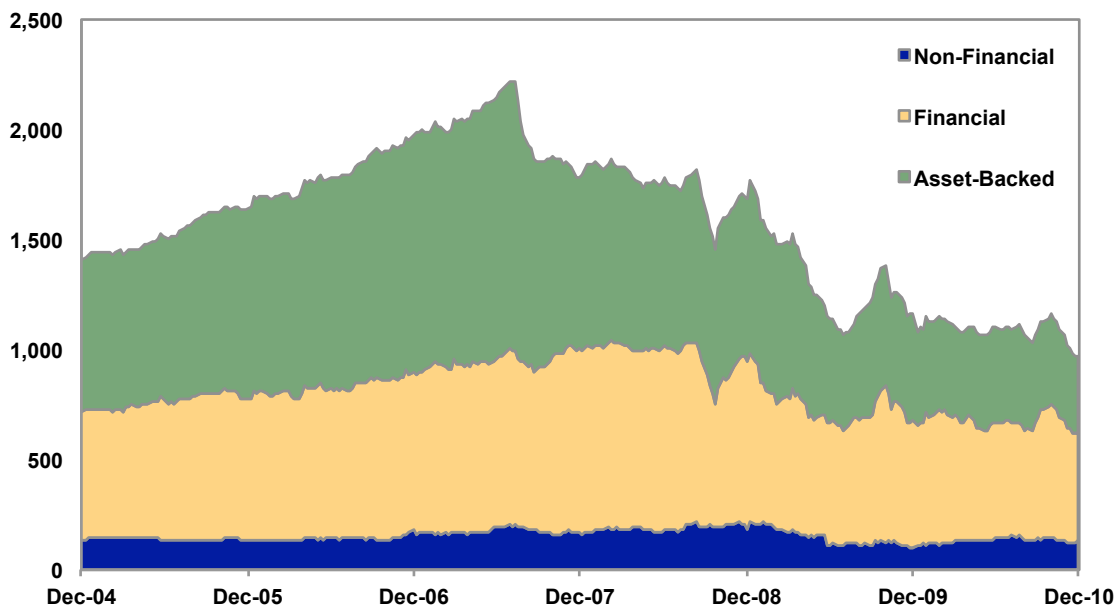
⁵⁵¹ David Serchuk, *Another Run on Money Market Funds?*, FORBES, Sept. 25, 2009, <http://www.forbes.com/2009/09/24/money-market-lehman-intelligent-investing-break-buck.html>.

⁵⁵² Baba et al., *supra* note 372, at 70-72.

⁵⁵³ Fed. Reserve Release, *Volume Statistics for Commercial Paper Issuance*, <http://www.federalreserve.gov/releases/CP/volumestats.htm>; Bryan Keogh & Christopher Condon, *Commercial Paper Falls Most Ever as ConEd Sells Bonds*, BLOOMBERG, July 16, 2009, http://www.bloomberg.com/apps/news?pid=newsarchive&sid=ahK_pFZq4Wp4.

⁵⁵⁴ Marcin Kacperczyk & Philipp Schnabl, *When Safety Proved Risky: Commercial Paper During the Financial Crisis of 2007–2009*, 24 J. ECON. PERSP. 29, 41 (Winter 2010), http://pages.stern.nyu.edu/~sternfin/pschnabl/kacperczyk_schnabl.pdf; Chris Reese, *US Asset-Backed Commercial Paper Shrinks Markedly*, REUTERS, Sept. 18, 2008, <http://www.reuters.com/article/idUSN1840345120080918>.

Figure 2.2: Commercial Paper Outstanding – Seasonally Adjusted⁵⁵⁵
\$ billions



The scaling back of investment in commercial paper caused overnight spreads to leap to unprecedented highs.⁵⁵⁶ The total value of commercial paper outstanding continued to fall even after the U.S. Treasury announced on September 29, 2008 that it would guarantee MMMFs.⁵⁵⁷ The corporate commercial paper market, an important short-term credit source for non-financial companies distinct from ABCP, suffered much less disruption, though major corporate issuers such as Coca-Cola, General Electric, and WellPoint replaced commercial paper financing with higher yielding long-term debt,⁵⁵⁸ and also reacted by drawing on balance sheet cash and reducing overheads including employment.⁵⁵⁹ The impact on MMMFs and the partial paralysis of commercial paper markets in the aftermath of the RPF debacle thus began to spill directly into the non-financial economy as contagion effects were transmitted to capital markets for corporate borrowing. Testifying before the FCIC, Lehman’s noted bankruptcy attorney Harvey Miller

⁵⁵⁵ *Commercial Paper Outstanding Seasonally Adjusted* [Functions: FCPONCS, FCPOFCS, FCPOAB], Bloomberg Terminal, BLOOMBERG LP (last accessed Feb. 9, 2011).

⁵⁵⁶ Kacperczyk & Schnabl, *supra* note 554, at 40. For example, when Lehman filed for bankruptcy, the spread between overnight asset-backed commercial paper and the federal funds rate ballooned to over 300 basis points, up dramatically from already-steep spreads of 25 to 30 basis points over the previous weeks.

⁵⁵⁷ *Id.* at 30; Press Release, U.S. Dep’t of the Treasury, Treasury Announces Temporary Guarantee Program for Money Market Funds (Sept. 29, 2008), <http://www.ustreas.gov/press/releases/hp1161.htm>.

⁵⁵⁸ Kacperczyk & Schnabl, *supra* note 554, at 46.

⁵⁵⁹ FCIC REPORT, *supra* note 26, at 394.

observed that “[w]hen the commercial paper market died, the biggest corporations in America thought they were finished.”⁵⁶⁰

b. Repos and Interbank Lending

Although most visibly on display in the immediate impact on MMMFs and commercial paper markets, contagion following Lehman also affected the behavior of short-term interbank lending channels and the market for repurchase agreement (repo) financing. In the London Interbank Offered Rate (LIBOR) market where financial institutions extend unsecured loans to each other for periods ranging from overnight to three months, borrowing costs rose sharply and in unison. One-month U.S. dollar LIBOR rose to 3.43% by September 24, 2008, its highest level since the beginning of the year.⁵⁶¹ Euro and pound LIBOR rates exhibited similar increases.⁵⁶² The LIBOR-OIS spread (defined as the difference between LIBOR and the overnight indexed swap rate), a measure of interbank credit risk, rose sharply.⁵⁶³ The TED spread, another important indicator of the cost of interbank borrowing⁵⁶⁴ (defined as the difference between the LIBOR rate and the risk-free rate on short-term U.S. government borrowing), widened dramatically, registering an all-time high of 464 basis points on October 10, 2008, thirteen times

⁵⁶⁰ *Id.* at 355. For discussion of the wider impact of the financial crisis of 2007–2009 on the real (non-financial) economy, see generally FCIC REPORT, *supra* note 26, at 389-410; Thomas A. Russo & Aaron J. Katzel, *The 2008 Financial Crisis and Its Aftermath: Addressing the Next Debt Challenge* 61-62 (Working Draft, Oct. 25, 2010).

⁵⁶¹ Gavin Finch & Kim-Mai Cutle, *Libor Jumps as Banks Seek Cash to Shore Up Finances*, BLOOMBERG, Sept. 24, 2008, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aVGxm.ZU.0jM&>.

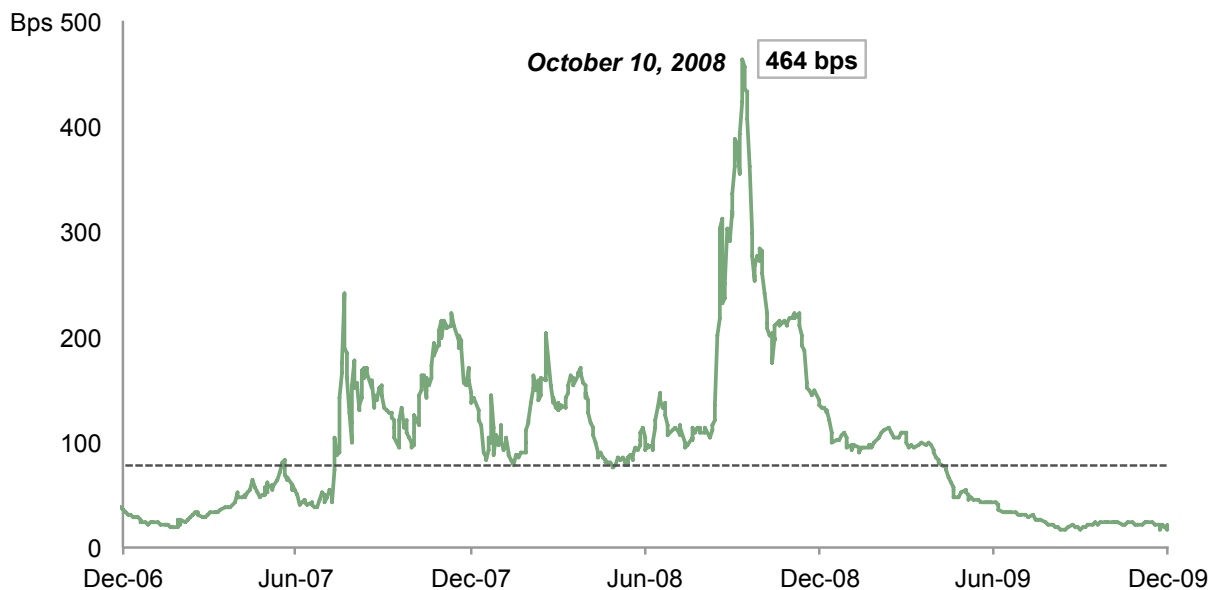
⁵⁶² *Id.*

⁵⁶³ *LIBOR-OIS Spread* [Functions: LOIS], Bloomberg Terminal, BLOOMBERG LP (last accessed Feb. 9, 2011). The LIBOR-OIS spread measures the difference between the London Interbank Offered Rate (LIBOR) and the overnight indexed swap (OIS) rate. The 3-month LIBOR is the rate at which banks borrow unsecured funds from other banks in the London wholesale money market for a 3-month period. An OIS allows a bank to exchange a fixed rate of interest on a notional amount for a reference floating rate (typically the federal funds rate) on that notional amount. The OIS rate is generally viewed as a measure of investor expectations of the effective federal funds rate, whereas LIBOR reflects credit risk and expectations of future overnight rates. The LIBOR-OIS spread can therefore be viewed as the premium banks are willing to pay to avoid the need to roll over the funds on a daily basis at changing overnight rates. Rajdeep Sengupta and Yu Man Tam, *The LIBOR-OIS Spread as a Summary Indicator*, FED. RES. BANK OF ST. LOUIS (2008), <http://research.stlouisfed.org/publications/es/08/ES0825.pdf>. See also FCIC REPORT, *supra* note 26, at 355.

⁵⁶⁴ See discussion in Brunnermeier, *supra* note 496, at 85 (noting the utility of the TED spread as a measure of liquidity in the financial system).

its level two years earlier on December 31, 2006, and six times its median level through December 31, 2009 (see Figure 2.3 below).⁵⁶⁵

Figure 2.3: TED Spread – Historical Evolution (bps)⁵⁶⁶



Traders and analysts described an effective disappearance of the market for unsecured lending.⁵⁶⁷ According to the FCIC’s Financial Crisis Inquiry Report, many banks simply discontinued lending to each other altogether.⁵⁶⁸ Inability to obtain financing from crippled interbank borrowing markets exacerbated the decline in bank stock prices that had been underway for over a year.⁵⁶⁹ Ordinary depositors of well-known consumer banks including Wachovia and Washington Mutual, the largest U.S. thrift, reacted by initiating so-called “silent runs,” withdrawing funds electronically en masse,⁵⁷⁰ compounding the drain on funding. Both

⁵⁶⁵ *Bloomberg.com Ted Spread Index*, BLOOMBERG, <http://www.bloomberg.com/apps/quote?ticker=.TEDSP:IND> (depicting historical data).

⁵⁶⁶ *TED Spread* [Functions: .TEDSP:INDEX], Bloomberg Terminal, BLOOMBERG LP (last accessed Feb. 9, 2011).

⁵⁶⁷ Finch & Cutle, *supra* note 561.

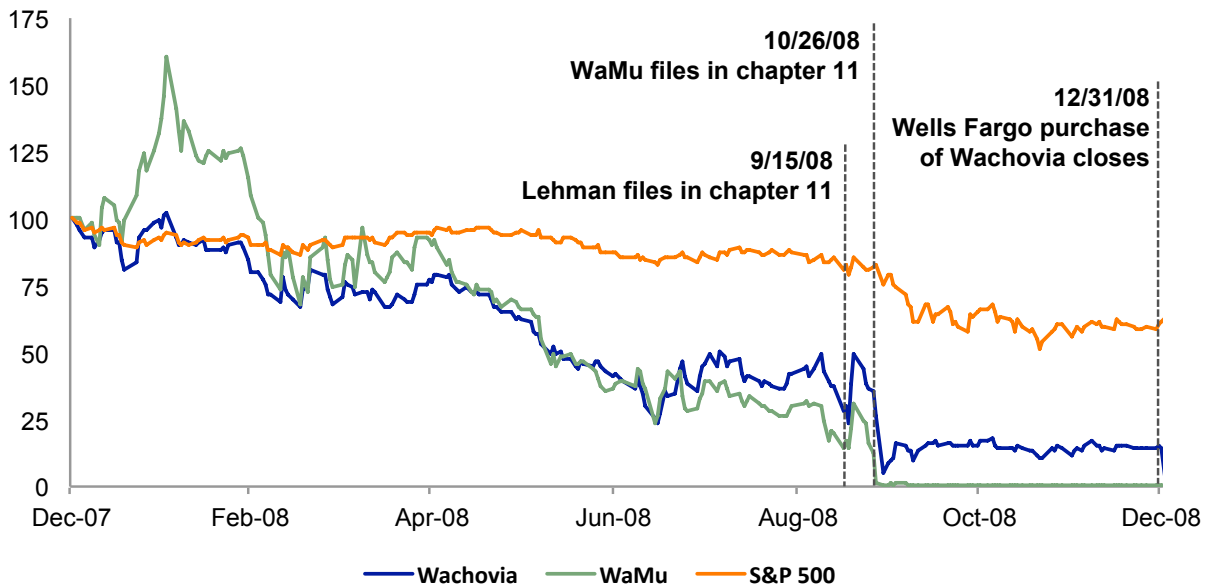
⁵⁶⁸ FCIC REPORT, *supra* note 26, at 355.

⁵⁶⁹ See Figures 2.3 and 2.4.

⁵⁷⁰ Rick Rothacker & Kerry Hall, *Wachovia Faced a ‘Silent’ Bank Run*, CHARLOTTE OBSERVER, Oct. 2, 2008, <http://www.charlotteobserver.com/2008/10/02/226799/wachovia-faced-a-silent-bank-run.html>; Brunnermeier, *supra* note 496, at 90 (noting silent run on Washington Mutual prior to its being placed in receivership and sold to JPMorgan Chase).

institutions ultimately failed and were acquired by Wells Fargo⁵⁷¹ and JPMorgan,⁵⁷² respectively (see Figure 2.4).

Figure 2.4: Wachovia and Washington Mutual – Share Price Evolution⁵⁷³



Repo markets were also seized by contagion. Repo borrowing rates increased across the board.⁵⁷⁴ The quantity of collateral demanded by lenders in interdealer repo markets (excluding tri-party repo), measured by the haircuts imposed on collateral posted in exchange for funding, skyrocketed.⁵⁷⁵ An index of haircuts on interdealer repo borrowing constructed by Gorton and Metrick (2010) indicates that haircuts on less liquid collateral (not including U.S. Treasury securities) leapt from an average of 25% to 45% during September 2008, after already having risen from 0% in January 2007.⁵⁷⁶ A study of the tri-party repo market undertaken by the Task

⁵⁷¹ News Release, Wells Fargo & Company, Wells Fargo and Wachovia Merger Completed (Jan. 1, 2009), https://www.wellsfargo.com/press/2009/20090101_Wachovia_Merger; News Release, Wells Fargo & Company, Wells Fargo's Merger with Wachovia to Proceed as Whole Company Transaction with All of Wachovia's Banking Operations (Oct. 9, 2008), https://www.wellsfargo.com/press/2008/20081009_merger_proceed.

⁵⁷² Press Release, Fed. Deposit Ins. Corp., JPMorgan Chase Acquires Banking Operations of Washington Mutual (Sept. 25, 2008), <http://www.fdic.gov/news/news/press/2008/pr08085.html>.

⁵⁷³ *Wachovia and Washington Mutual, Inc. Historical Share Prices* [Functions: WB Equity, WAMUQ Equity], Bloomberg Terminal, BLOOMBERG LP (last accessed Feb. 9, 2011).

⁵⁷⁴ See Gorton & Metrick, *supra* note 516, at 27, 50 (finding that increases in repo spreads and repo haircuts during the financial crisis of 2007–2009 were correlated with uncertainty concerning counterparty risk and collateral values, respectively).

⁵⁷⁵ *Id.* at 27, 47.

⁵⁷⁶ *Id.* The authors' data set focuses on interdealer repo markets and excludes the tri-party repo market.

Force on Tri-Party Repo Infrastructure has echoed these conclusions, determining that the breakdown in the tri-party repo market was central to the liquidity crisis at securities firms during the crisis.⁵⁷⁷ In contrast with interdealer repo markets, however, haircuts in the tri-party repo market rose very little, suggesting that some cash investors (including certain MMMFs, which constituted between a quarter and a third of cash invested in the tri-party repo market)⁵⁷⁸ simply withdrew entirely from investing in tri-party repo instead of demanding more or higher-quality collateral.⁵⁷⁹ On balance, however, the tri-party repo market appears to have weathered the post-Lehman after-effects with more resilience than the interdealer market or the unsecured interbank lending market. Analysis by Copeland, Martin, and Walker (2010) highlights how the targeted run on Lehman caused its tri-party repo borrowing book to decline precipitously (from \$150 billion encompassing 60 investors on September 8 to \$95 billion or 40 investors on September 12, to fewer than 20 investors on September 15, 2008)⁵⁸⁰ but records only a gradual reduction in the overall amount of tri-party repo collateral across the entire marketplace after the Lehman bankruptcy.⁵⁸¹

c. Effects of Contagion on Major Investment Banks

Contagion effects in the short-term capital markets appear to have shaken the confidence of customers and investors in the ability of the surviving investment banks to continue funding themselves. Hedge funds and other prime brokerage customers of Morgan Stanley, Goldman Sachs, and Merrill Lynch reacted by withdrawing assets on deposit and diverting them to

⁵⁷⁷ FED. RES. BANK OF N.Y., TASK FORCE ON TRI-PARTY REPO INFRASTRUCTURE, PROGRESS REPORT 2 (Dec. 22, 2009), http://www.ny.frb.org/prc/report_091222.pdf.

⁵⁷⁸ Adam Copeland et al., *The Tri-Party Repo Market Before the 2010 Reforms* 6 (Fed. Reserve Bank of N.Y., Staff Report No. 477, Nov. 2010), http://www.ny.frb.org/research/staff_reports/sr477.pdf.

⁵⁷⁹ *Id.* at 2; Antoine Martin et al., *Repo Runs* 5 (Fed. Reserve Bank of N.Y., Staff Report No. 444, May 2010), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1594895&rec=1&srcabs=1138609 (finding that tri-party repo haircuts exhibited more stability through the crisis, suggesting that investors in tri-party repo agreements opted to cut off dealer financing rather than increase haircuts). Collateral securing tri-party repo transactions consists predominantly of U.S. Treasury and agency MBS and debentures, which composed over 80% of the tri-party repo market as of the first quarter of 2010. *See* Fed. Reserve Bank of N.Y., *Tri-Party Repo Infrastructure Reform* 8 (White Paper, May 17, 2010), http://www.newyorkfed.org/banking/nyfrb_triparty_whitepaper.pdf.

⁵⁸⁰ Copeland et al., *supra* note 578, at 56.

⁵⁸¹ *Id.* at 47-48.

JPMorgan, Credit Suisse, and Deutsche Bank.⁵⁸² Morgan Stanley may have sustained \$20 to \$120 billion in outflows in the weeks surrounding the bankruptcy of Lehman, some of which flowed into JPMorgan Chase's prime brokerage business.⁵⁸³ Interviews with Morgan Stanley executives by the FCIC indicate that hedge funds requested \$10 billion in redemptions on Monday, September 15 and as much as \$32 billion on Wednesday, September 17, 2008.⁵⁸⁴ Withdrawals of prime brokerage assets by hedge funds were partly driven by investor redemptions underway at hedge funds themselves, which averaged 20% of assets in the fourth quarter of 2008 according to a survey conducted by the FCIC.⁵⁸⁵ Furthermore, hedge funds and other institutional clients began to insist on segregated accounts and refused to allow the rehypothecation of their collateral.⁵⁸⁶ As a result, prime brokers saw a dramatic decline in their holdings of pledgeable collateral. In particular, from August 2008 to November 2008, Morgan Stanley's holdings fell from \$877 billion to \$294 billion, while Goldman Sachs's fell from \$832 billion to \$579 billion.⁵⁸⁷

The outflows from prime brokerage and mounting skepticism about the future of the independent investment banking business model propelled CDS spreads on Goldman Sachs and Morgan Stanley upward.⁵⁸⁸ For example, the cost of insuring \$10 million of debt issued by Morgan Stanley rose 88% (from \$363,000 to \$682,000 annually) between September 12 and

⁵⁸² FCIC REPORT, *supra* note 26, at 355 (noting effect of hedge fund withdrawals of assets held by Merrill Lynch prior to the closing of its merger with Bank of America and flows to "large commercial banks with...more diverse sources of liquidity"); Allan Sloan, *A Year After Lehman, Wall Street Acting Like Wall Street Again*, WASH. POST (Sept. 8, 2009), <http://www.washingtonpost.com/wp-dyn/content/article/2009/09/07/AR2009090701798.html>.

⁵⁸³ *The Run on Morgan Stanley*, FT.COM/ALPHAVILLE, *supra* note 472; Saijel Kishan & Katherine Burton, *Morgan Stanley Loses Hedge-Fund Clients on Stock Drop*, BLOOMBERG, Sept. 18, 2008, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aFsdjjZ3hSec&refer=home>; Bess Levin, *Running Down Wall Street*, DEALBREAKER.COM, Sept. 18, 2008, <http://dealbreaker.com/2008/09/running-down-wall-street/>.

⁵⁸⁴ FCIC REPORT, *supra* note 26, at 361.

⁵⁸⁵ *Id.* at 361 n.34.

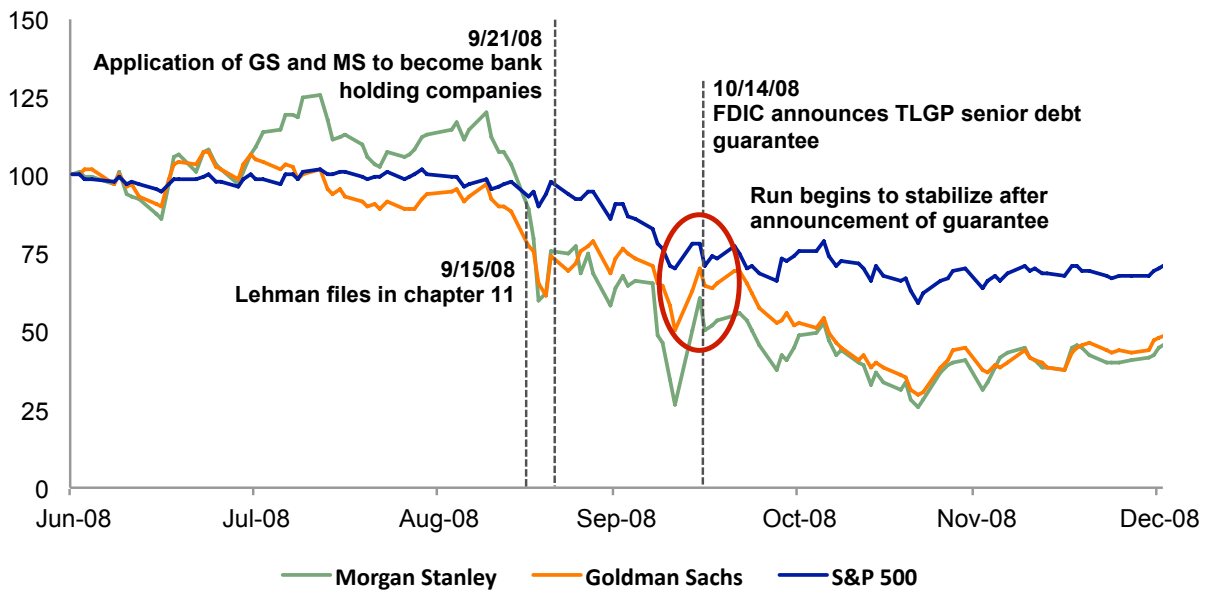
⁵⁸⁶ Singh & Aitken, *supra* note 205, at 7-8.

⁵⁸⁷ *Id.*

⁵⁸⁸ Christine Harper, *Morgan Stanley Said to Weigh Deal with Wachovia as Shares Sink*, BLOOMBERG, Sept. 17, 2008, <http://www.bloomberg.com/apps/news?pid=newsarchive&refer=home&sid=ai1ZDv3cwcL4>; Tiernan Ray, *Goldman Shares Off 33% For Week as CDS Fears Spread*, BARRON'S, Sept. 17, 2008, <http://blogs.barrons.com/stockstowatchtoday/2008/09/17/goldman-shares-33-off-this-week-as-cds-fears-spread/>.

September 15, 2008.⁵⁸⁹ The share prices of both banks plummeted dramatically, falling 12% and 14% respectively on September 15, a further 2% and 11% on September 16, and continuing to fall 14% and 24% on September 17,⁵⁹⁰ prompting speculation that Morgan Stanley would seek a merger with a commercial banking partner.⁵⁹¹ The run on both investment banks continued even after the Federal Reserve approved the conversion of each to a bank holding company on September 21,⁵⁹² and was finally averted only after the FDIC issued guarantees of new unsecured senior bank debt the next month through the TLGP program discussed below in subsection (d),⁵⁹³ after which the share price decline at both banks began to stabilize (*see* Figure 2.5).

Figure 2.5: Morgan Stanley and Goldman Sachs – Share Price Evolution⁵⁹⁴



⁵⁸⁹ FCIC REPORT, *supra* note 26, at 360. This increase in CDS spreads affected both dealers and end clients. *See* Or Shachar, *Exposing The Exposed: Intermediation Capacity in the Credit Default Swap Market* (Nov. 2011). Shachar examined sample CDS contracts among the top dealers from 2007 to mid-2009, and found that after Lehman's bankruptcy, dealers found it more difficult to offset their positions, so the interdealer market was "congested" and dealers' ability to provide liquidity to their clients also decreased.

⁵⁹⁰ Christine Harper, *Morgan Stanley, Goldman Plummet After AIG Takeover*, BLOOMBERG, Sept. 17, 2008, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=arhxN1IPfEfY&refer=us>.

⁵⁹¹ Harper, *supra* note 588.

⁵⁹² *See* Press Release, Bd. of Governors of the Fed. Reserve Sys. (Sept. 21, 2008), <http://federalreserve.gov/newsevents/press/bcreg/20080921a.htm>.

⁵⁹³ *See* Press Release, Fed. Deposit Ins. Corp., FDIC Announces Plan to Free Up Bank Liquidity (Oct. 14, 2008), <http://www.fdic.gov/news/news/press/2008/pr08100.html>.

⁵⁹⁴ *Morgan Stanley and Goldman Sachs Historical Share Prices* [Functions: MS Equity, GS Equity], Bloomberg Terminal, BLOOMBERG LP (last accessed Feb. 9, 2011).

d. The Government Response to Contagion

The federal government took a multipronged approach to the freeze-up across the market.⁵⁹⁵ In the commercial paper market, the Fed extended indirect access to the discount window to MMMFs through the Federal Reserve's \$150 billion Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF),⁵⁹⁶ creating the \$350 billion Commercial Paper Funding Facility (CPFF)⁵⁹⁷ and the Money Market Investor Funding Facility (MMIFF).⁵⁹⁸ Perhaps most dramatically, the U.S. Treasury provided an effective \$3.2 trillion temporary guarantee of the liabilities of the money market funds through the U.S. Treasury's Exchange Stabilization Fund.⁵⁹⁹ In addition, the Federal Reserve sponsored the term auction facility (TAF) in December 2007,⁶⁰⁰ extended access to the discount window to primary dealers including investment banks through the Primary Dealer Credit Facility (PDCF) in connection with the acquisition of Bear Stearns by JPMorgan on March 16, 2008,⁶⁰¹ and created the term securities lending facility (TSLF) in March 2008⁶⁰² and the term asset-backed securities loan facility (TALF).⁶⁰³ In September 2008, the Federal Reserve participated in the rescue of AIG by providing the failing insurer with an \$85 billion two-year loan.⁶⁰⁴ In October 2008, the FDIC

⁵⁹⁵ See SCOTT & GELPERN, *supra* note 486, at 42-82.

⁵⁹⁶ Press Release, Bd. of Governors of the Fed. Reserve Sys. (Sept. 19, 2008), <http://www.federalreserve.gov/newsevents/press/monetary/20080919a.htm>; Bd. of Governors of the Fed. Reserve Sys., *Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility*, <http://www.federalreserve.gov/monetarypolicy/abcpmmmf.htm>.

⁵⁹⁷ Press Release, Bd. of Governors of the Fed. Reserve Sys. (Oct. 7, 2008), <http://www.federalreserve.gov/newsevents/press/monetary/20081007c.htm>.

⁵⁹⁸ Press Release, Bd. of Governors of the Fed. Reserve Sys. (Oct. 21, 2008), <http://www.federalreserve.gov/newsevents/press/monetary/20081021a.htm>.

⁵⁹⁹ Press Release, U.S. Dep't of the Treasury, *supra* note 557.

⁶⁰⁰ Press Release, Bd. of Governors of the Fed. Reserve Sys. (Dec. 12, 2007), <http://www.federalreserve.gov/newsevents/press/monetary/20071212a.htm>.

⁶⁰¹ Press Release, Bd. of Governors of the Fed. Reserve Sys. (Mar. 16, 2008), <http://www.federalreserve.gov/newsevents/press/monetary/20080316a.htm>; Fed. Reserve Bank of N.Y., *Primary Dealer Credit Facility: Frequently Asked Questions*, http://www.newyorkfed.org/markets/pdcf_faq.html (last visited Feb. 27, 2012); Fed. Reserve Bank of N.Y., *Primary Dealer Credit Facility: Program Terms and Conditions*, http://www.newyorkfed.org/markets/pdcf_terms.html (last visited Jan. 9, 2011).

⁶⁰² Press Release, Bd. of Governors of the Fed. Reserve Sys. (Mar. 11, 2008), <http://www.federalreserve.gov/newsevents/press/monetary/20080311a.htm>; see also HAL S. SCOTT, *THE GLOBAL FINANCIAL CRISIS* 21-32 (2009).

⁶⁰³ Press Release, Bd. of Governors of the Fed. Reserve Sys. (Nov. 25, 2008), <http://www.federalreserve.gov/newsevents/press/monetary/20081125a.htm>; see also Fed. Reserve Bank of N.Y., *Term Asset-Backed Securities Loan Facility: Frequently Asked Questions*, http://www.newyorkfed.org/markets/talf_faq.html (last visited Feb. 27, 2012).

⁶⁰⁴ Press Release, Bd. of Governors of the Fed. Reserve Sys. (Sept. 16, 2008), <http://www.federalreserve.gov/newsevents/press/other/20080916a.htm>.

instituted the Temporary Liquidity Guarantee Program (TLGP) to provide limited guarantees of new senior unsecured debt issued by banks and thrifts.⁶⁰⁵ Most prominently of all, the Treasury used the Troubled Asset Relief Fund (TARP) to inject equity into failing major financial institutions through the Capital Purchase Program (CPP)⁶⁰⁶ and to restructure the Federal Reserve's emergency support for AIG.⁶⁰⁷

The panoply of government-administered guarantees and facilities to restore liquidity halted the run on the financial system and contained the transmission of contagion. But the shockwaves generated through the failure of Lehman Brothers, its immediate effects upon the RPF, and the broad contagious consequences for the capital markets underline the centrality of non-deposit short-term funding and intermediation by non-bank financial institutions in the U.S. financial system.⁶⁰⁸

The intermediation of credit creation by non-bank financial institutions has expanded the scope of the systemic risk presented by contagion because this system forms a novel channel for maturity transformation that is conducted in a securitized format.⁶⁰⁹ Like ordinary depositors, investors participating in this process, particularly those invested in MMMFs, regard their funds as cash equivalents to which the threat of impairment of any kind is intolerable, and which are prone to the same form of run behavior.⁶¹⁰ Whether in securitized or traditional form, however, maturity transformation is unquestionably a source of profound surplus value to the economy

⁶⁰⁵ Press Release, Fed. Deposit Ins. Corp., *supra* note 593; *see also* Fed. Deposit Ins. Corp., *Temporary Liquidity Guarantee Program*, <http://www.fdic.gov/regulations/resources/tlgp/index.html> (last visited Feb. 27, 2012).

⁶⁰⁶ U.S. DEP'T OF THE TREASURY, THIRD TRANCHE REPORT TO CONGRESS (Dec. 2, 2008); U.S. Dep't of the Treasury, *Investment Programs: Capital Purchase Program*, <http://www.treasury.gov/initiatives/financial-stability/TARP-Programs/bank-investment-programs/cap/Pages/overview.aspx>.

⁶⁰⁷ Joint Press Release, Bd. of Governors of the Fed. Reserve Sys. & U.S. Dep't of the Treasury, U.S. Treasury and Federal Reserve Board Announce Participation in AIG Restructuring Plan (Mar. 2, 2009), <http://www.federalreserve.gov/newsevents/press/other/20090302a.htm>; Press Release, Bd. of Governors of the Fed. Reserve Sys. (Nov. 10, 2008), <http://www.federalreserve.gov/newsevents/press/other/20081110a.htm>.

⁶⁰⁸ *See, e.g., Causes of the Recent Financial and Economic Crisis: Hearing Before the Fin. Crisis Inquiry Comm'n* (Sept. 2, 1010) (statement of Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys.), <http://www.federalreserve.gov/newsevents/testimony/bernanke20100902a.htm> (identifying as a cause of the financial crisis of 2007–2009 the “major role in global finance” served by “financial entities other than regulated depository institutions... dependent on various forms of short term wholesale funding”).

⁶⁰⁹ Martin et al., *supra* note 579, at 3-5 (noting that “[a]n overnight repo is a short-term liability that is backed by a long-term asset, in the form of a security”); Ricks, *supra* note 492, at 3-6.

⁶¹⁰ Ricks, *supra* note 492, at 10, 19-20 (“Many of these short-term instruments make their way to money market mutual funds, where, in a final step of maturity transformation, they serve as the basis for the creation of demand money (transaction accounts) for retail and institutional customers.”).

and its participants, since by holding longer term assets than liabilities, the financial sector allows households and businesses to mitigate the risks arising from cash flow uncertainties.⁶¹¹ Involving the securitized debt markets in this activity ultimately lowers the social cost of capital, to the extent that contagion in these markets can be managed cost-effectively. As such, the size and centrality, but most importantly the economic role of these market-based credit intermediaries mandate their inclusion within the coverage of any regulatory regime designed to address and contain the problem of contagion comprehensively.

B. Potential Solutions to Contagion

The paper now turns to a discussion of solutions to contagion. It is worth noting that this section does not discuss other proposed financial regulatory reform initiatives that do not directly address financial contagion. For example, the Volcker Rule, which prohibits commercial banks from engaging in proprietary trading and limits their investments in private equity or hedge funds, does not make financial institutions less susceptible to the flight of short-term creditors. Rather, “the Rule’s ultimate intention was less to cure a particular cause of the financial crisis and more to champion the populist view that commercial banking should be separated from investment banking.”⁶¹² This section’s discussion of potential solutions to contagion is divided into three parts. First, it focuses on the three strategies that have been favored by policy makers since the crisis: capital requirements, liquidity requirements, and resolution procedures. It also discusses proposals for money market mutual fund reform. Second, it discusses mechanisms that directly address the contagion risks posed by the structural dependency on short-term funding, namely through the protection of short-term creditors in the form of lender of last resort or public guarantees. Finally, it turns to strategies actually used during the crisis but which have become disfavored due to their element of public support under the rubric of “bailouts”: lender of last resort and guarantees, and injection of public capital.

⁶¹¹ FINANCIAL SERVICES AUTHORITY, THE TURNER REVIEW: A REGULATORY RESPONSE TO THE GLOBAL BANKING CRISIS 21 (Mar. 2009), http://www.fsa.gov.uk/pubs/other/turner_review.pdf; *see also* Gorton, *supra* note 513, at 42 (noting that “securitization is a more efficient way to finance loans”).

⁶¹² Charles K. Whitehead, *The Volcker Rule and Evolving Financial Markets*, 1 HARVARD BUS. L. REV. 39, 41-42 (2011), http://www.hblr.org/download/HBLR_1_1/Whitehead-Volcker_Rule.pdf.

1. Capital Requirements, Liquidity Requirements, Resolution Procedures, and Money Market Mutual Fund Reform

Since the financial crisis of 2007-2009, the adequacy of three prominent strategies to counter contagion has been placed in question: (1) ex ante capital requirements designed to enable financial institutions that are operating as going concerns to incur losses without failing; (2) ex ante private liquidity requirements that ensure the existence of high-quality assets that can be sold or pledged as collateral to meet sudden withdrawals (allowing institutions to survive without public liquidity support); and (3) ex post resolution procedures that impose losses on the debt and equity holders of financial institutions that are being wound down. Loss imposition and the avoidance of government support are the basic objectives common to all three strategies. Both are crucial preconditions for limiting moral hazard and minimizing subsidization of uneconomic risk-taking in the financial system. But unless the strategies explored below either incorporate or are mated to mechanisms that directly eliminate the enormous potential costs contemplated by financial contagion, regulatory efforts to enforce strict cost internalization are likely to prove insufficient.

This study's fundamental concern with all three strategies is that none may supply the financial system with a direct mechanism for deterring runs by short-term creditors, nor is equipped as a result to suppress contagion. Capital requirements can reduce the chance that a systemically important financial institution could fail—the more capital an institution has, the better it can withstand a run. That being said, runs are likely to overwhelm any reasonable capital requirements, even a “Swiss finish” to Basel III (i.e., the more stringent capital requirements imposed by the Swiss government), due to losses that will follow from fire sales of assets. Capital requirements cannot prevent contagion generally, both because the amount of capital might prove to be insufficient and also because short-term debt holders might not pay attention to an institution's solvency during a run. Related to capital requirements is the strategy of liquidity requirements. Liquidity requirements can secure temporary access to liquid assets, but cannot indefinitely resist a contagious run that outlasts the coverage they provide. Both strategies may also be considerably less efficient than liquidity provided by a public lender-of-last-resort, a major function of central banking. Resolution procedures that threaten short-term debt holders with losses are likely to *provoke* contagion, unless they assure these creditors of a bailout

beforehand, which may be impractical and, under Dodd-Frank, statutorily impermissible. In any event it is hard to see how resolution procedures can have any appreciable impact on minimizing contagion whatever their utility is in decreasing moral hazard and avoiding taxpayer losses from bank failure.

a. Ex Ante Capital Requirements: Basel III Framework

In theory, government-imposed capital requirements are generally thought necessary to mitigate the ex ante effects of regulatory safety nets on banks' risk taking and level of leverage. A significant effect of deposit insurance is that since depositors no longer face the same risk exposure as without the insurance, it transforms deposits from "*de jure* overnight debt financing," which provides a high degree of market credit discipline on a bank, into "*de facto* patient debt financing" that is much less sensitive to the bank's riskiness.⁶¹³ As a result, the cost of short-term bank debt from deposits is relatively insensitive to the bank's leverage even as this leverage increases. While banks clearly have an incentive to pile on this relatively "cheap" debt, the cost of the bank's increased risk of default is borne by the deposit insurance fund, effectively allowing banks to extract rent from the insurer. The imposition of capital requirements stems this moral hazard based on the proposition that "capital reduces incentives for incurring risks."⁶¹⁴ In addition to the effects on risk taking, justification for government imposed capital requirements includes the fact that "capital serves as a buffer against unexpected losses."⁶¹⁵ Unexpected losses and the bank's consequent deleveraging can result in the fire sale of bad assets, likely causing negative knock-on effects on otherwise healthy banks that hold the same or similar assets.⁶¹⁶ Furthermore, in the case of a macro shock occurring during a credit crunch, this deleveraging could further impair the health of an already weakened macro economy. Capital requirements potentially mitigate these negative externalities, which can arise regardless of deposit insurance or even the presumption of public bailouts. A third justification for capital requirements is that "a

⁶¹³ Viral Acharya, Hamid Mehran, Til Schuermann & Anjan Thakor, *Robust Capital Regulation* (Ctr. for Econ. Pol'y Research, Discussion Paper Series No. 8792, Jan. 2012).

⁶¹⁴ Martin Hellwig, *Capital Regulation after the Crisis: Business as Usual?*, Max Planck Institute for Research on Collective Goods (July 2010).

⁶¹⁵ *Id.*

⁶¹⁶ See Samuel Hanson, Anil K. Kashyap & Jeremy C. Stein, *A Macroprudential Approach to Financial Regulation*, J. ECON. PERSP. (forthcoming).

capital requirement provides the supervisor with room for intervention before the bank becomes insolvent.”⁶¹⁷

These traditional justifications for government-imposed capital requirements are subject to some serious questions, however. First, as later discussed, an increasing part of banks’ short-term liabilities are uninsured and thus could be subject to market discipline. Second, given the relatively low levels of capital required even by Basel III, i.e., 7% of common equity plus a buffer, the potential for significant moral hazard still exists. The relatively small increase in required capital is not likely to appreciably reduce the willingness of management or shareholders to “risk the farm” in the face of an impending insolvency, although it may affect monitoring behavior on behalf of longer-term exposed creditors. The incentive to increase capital levels already exists to some extent as a result of credit ratings and the related cost of debt financing. In any event, as discussed below, government imposed capital requirements are unlikely to be sufficient to withstand contagious runs.

Skepticism of existing regimes governing the capital requirements to which financial institutions are subject has been vindicated to a significant extent by the financial crisis of 2007-2009.⁶¹⁸ As these regimes have come to be viewed as inadequate,⁶¹⁹ the first major strategy for financial reform that was widely considered by policymakers was to recalibrate the existing framework for capital regulation. The basic rationale for strengthened capital requirements is that capital allocates a “strategic reserve” of resources to the financial system that fortifies it against future shocks. Capital standards that are conservative, robust to economic downturns, and that behave countercyclically through the credit cycle serve to position financial institutions to absorb large losses and internalize the costs of distress without forcing the government to step in with

⁶¹⁷ Hellwig, *supra* note 614.

⁶¹⁸ See generally CAPITAL ADEQUACY BEYOND BASEL: BANKING, SECURITIES, AND INSURANCE (Hal S. Scott ed., 2005); CCMR PLAN FOR REGULATORY REFORM, *supra* note 8, at 57-82; SCOTT & GELPERN, *supra* note 486, at 412-73; DANIEL K. TARULLO, BANKING ON BASEL: THE FUTURE OF INTERNATIONAL FINANCIAL REGULATION (2008); Scott, *The Reduction of Systemic Risk in the United States Financial System*, *supra* note 1, at 679-86.

⁶¹⁹ Scott, *The Reduction of Systemic Risk in the United States Financial System*, *supra* note 1, at 679-80. The SEC’s implementation of Pillar I of Basel II for U.S. securities firms allowed the five major U.S. investment banks (Goldman Sachs, Morgan Stanley, Merrill Lynch, Lehman Brothers, and Bear Stearns) to reach leverage ratios of greater than thirty to one; see also CCMR PLAN FOR REGULATORY REFORM, *supra* note 8, at 57-82 (considering initiatives to improve capital regulation); Comm. on Capital Mkts. Reg., *Future Research—Capital Study*, <http://www.capmksreg.org/futureresearch.html> (last visited Feb. 27, 2012) (detailing forthcoming research program on the role of markets in setting capital requirements).

public support by undertaking an expensive bailout or acting as lender-of-last-resort. This lowers the likelihood of a systemically important institution failing, imposing losses on the public, and becoming a transmission line for contagion.

The core of this rationale often presumes that contagion is triggered by an actual failure of a financial firm. Assuming this is one of its preconditions, capital requirements might help to lower the risk of contagion by reducing the likelihood of such failures taking place.⁶²⁰ The most serious contagion effects (for example, on MMMFs and short-term capital markets) witnessed in the financial crisis only began to spread after the collapse of Lehman Brothers and the run on the RPF, lending some credibility to this diagnosis. On the other hand, the analysis of those episodes conducted in Part II.A.4 establishes that these effects reached far beyond institutions that were exposed to Lehman in any significant degree. This makes it appear more likely that the contagious aftershocks were evidence of a reaction by short-term creditors to the withdrawal of the implied federal guarantee of financial institutions signaled by the government's decision not to rescue Lehman.⁶²¹ Concern that the next failure would not be entitled to a bailout might have prompted creditors to exit from institutions regardless of their relationship to Lehman, or Lehman's actual failure. Once the run was underway, all short-term investors in a position to exit (and lacking a government guarantee) possessed a rational incentive to do so.

The demand for liquidity forced institutions that were affected by runs to engage in fire sales of long-term assets. Since these assets were illiquid, institutional sellers had to accept discounts on many of the sales. Massive disorderly selling drove asset prices down further for other institutions holding these assets, wiping out existing capital, causing further withdrawals, and exacerbating fear and lost confidence among short-term investors. If contagion had been the result of fear that the next series of failures and market freeze-ups would not be offset by a government guarantee, then capital requirements would not have been sufficient to overcome it. In the end, only promising multiple explicit public guarantees was enough to halt the spread of contagion, indicating that assurances about institutional solvency transmitted through capital

⁶²⁰ See BASEL COMM. ON BANKING SUPERVISION, STRENGTHENING THE RESILIENCE OF THE BANKING SECTOR: CONSULTATIVE DOCUMENT (Dec. 2009), <http://www.bis.org/publ/bcbs164.htm> (attributing the origins of the financial crisis of 2007–2009 to suboptimal capitalization and insufficient liquidity).

⁶²¹ This argument is raised by Peter Wallison in his dissent from the conclusions of the Financial Crisis Inquiry Report released by the Financial Crisis Inquiry Commission. See FCIC REPORT, *supra* note 26, at 445.

ratios were inadequate. Moreover, because Basel III will apply narrowly to traditional banking institutions, large portions of the non-bank financial system that share the same dependency on short-term debt will probably not be required to comply with its new capital requirements. This could encourage migration of existing banking activity into non-bank financial institutions beyond Basel III's reach. As we have discussed, today, depository banking is no longer the central source of systemic risk to the financial system, so capital regulation oriented only at preserving *bank* solvency cannot be a general solution to the problem of contagion.

The leading reform proposal for international capital regulation that has emerged from the financial crisis is called “Basel III” and was developed by the Basel Committee on Banking Supervision (Basel or Committee) of the Bank for International Settlements.⁶²² Basel III is part of a broader series of reform initiatives sponsored by the Group of 20 (G-20) in response to the financial crisis.⁶²³ U.S. regulators issued a notice of proposed rulemaking in June 2012 implementing key provisions of Basel III.⁶²⁴ These provisions include minimum regulatory capital requirements, a standardized approach for the calculation of risk-weighted assets (“RWAs”), and a revision to the advanced approach risk-based capital rule, which aims to replace references to credit ratings with alternative standards of creditworthiness.⁶²⁵ Some

⁶²² BASEL COMM. ON BANKING SUPERVISION, *supra* note 620; Press Release, Basel Comm. on Banking Supervision, Group of Governors and Heads of Supervision Announces Higher Global Minimum Capital Standards (Sept. 12, 2010), <http://www.bis.org/press/p100912.pdf> [hereinafter Press Release, Minimum Capital Standards]; Jaime Caruana, Gen. Manager, Bank for Int'l Settlements, Speech at the 3rd Santander International Banking Conference: Basel III: Towards a Safer Financial System (Sept. 15, 2010), <http://www.bis.org/speeches/sp100921.pdf>; BASEL COMMITTEE ON BANKING SUPERVISION, BANK FOR INT'L SETTLEMENTS, ANNEX (July 26, 2010), <http://www.bis.org/press/p100726/annex.pdf>.

⁶²³ LEADERS OF THE GROUP OF 20, DECLARATION: SUMMIT ON FINANCIAL MARKETS AND THE WORLD ECONOMY (Nov. 15, 2008), http://www.meti.go.jp/policy/trade_policy/wto/declaration.pdf.

⁶²⁴ Joint Press Release, Bd. of Governors of the Fed. Res. Sys., Fed. Deposit Ins. Corp., Office of the Comptroller of the Currency, Agencies Seek Comment on Regulatory Capital Rules and Finalize Market Risk Rule (June 12, 2012), <http://www.federalreserve.gov/newsevents/press/bcreg/20120612a.htm>; see *Dodd-Frank Act Hearing Before the S. Comm. on Banking, Housing & Urban Affairs*, 112th Cong. (July 21, 2011) (statement of Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Res. Sys.) (noting that “the Federal Reserve...working with other banking agencies, is on schedule to implement Basel III”). Though Basel II was published in June 2004, it remains only partially implemented in the United States. In June 2011 the FDIC approved a rule implementing the Dodd-Frank Act's “Collins Amendment,” which mandates that banks with over \$250 billion in assets (those eligible under Basel II to use internal risk models) calculate regulatory capital requirements based on the Basel I-based standard used by smaller banks, and adhere to whichever capital requirement is higher. Alan Zibel, *U.S. Approves Minimum Capital Standard for Big Banks*, WALL ST. J., June 14, 2011, <http://online.wsj.com/article/SB10001424052702303848104576385593574391846.html>.

⁶²⁵ See Bd. of Governors of the Fed Res. Sys., *Basel III Memoranda: Notices of Proposed Rulemaking - Enhancements to the Regulatory Capital Requirements* (June 4, 2012) http://www.federalreserve.gov/aboutthefed/boardmeetings/Basel_memo_20120607.pdf.

believe that selected systemically important non-bank financial institutions subject to supervision by the Federal Reserve could also be required to adopt Basel III under §165 of Dodd-Frank,⁶²⁶ though this is not certain nor expressly required by the statute. Section 165 directs the Federal Reserve and the Financial Stability Oversight Council (FSOC) to “establish prudential standards for nonbank financial companies...that...are more stringent than the standards and requirements applicable to nonbank financial companies...not present[ing] similar risks to the financial stability of the United States.”⁶²⁷ These standards are stated to include “risk-based capital requirements and leverage limits.”⁶²⁸ At this time it is not yet clear, however, if regulators will choose to use this statutory language to support the application of Basel III to designated systemically important non-bank financial institutions.

The centerpiece of Basel III is a series of amendments to the capital adequacy standards embodied in the worldwide framework for capital regulation created by Basel I and extensively revised and expanded under Basel II.⁶²⁹ These amendments specify three broad revisions to the Basel I and II architecture: (1) increases in minimum mandatory bank capital requirements, (2) new measures to control countercyclicality in capital regulation, (3) new restrictions on what instruments qualify as capital and adjustments to risk weightings, and (4) expanded stress testing requirements.

⁶²⁶ Dodd-Frank Act § 165; Ernest Patrikis, *Higher Minimum Capital Standards: Basel Committee On Banking Supervision Crowns Common Equity King*, BNA INSIGHTS, Nov. 30, 2010.

⁶²⁷ Dodd-Frank Act § 165(a)(1), (a)(1)(A).

⁶²⁸ *Id.* § 165(b)(1)(A)(i).

⁶²⁹ See BASEL COMM. ON BANKING SUPERVISION, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS 3 (1998), <http://www.bis.org/publ/bcbssc111.pdf>.

Figure 2.6: Basel III Capital Requirements Provisional Phase-In Schedule⁶³⁰

Phase-in year	Basel II Current	2013	2015	2017	January 1, 2019
COMMON EQUITY					
Common equity capital	2.00%	3.50%	4.50%	4.50%	4.50%
Add: Capital conservation buffer	--	0.00%	0.00%	1.25%	2.50%
Common equity + buffer	2.00%	3.50%	4.50%	5.75%	7.00%
<i>N.B.: Including maximum 2.5% countercyclical buffer</i>					9.50%
TIER 1 AND TOTAL CAPITAL					
Minimum tier 1 capital	4.00%	4.50%	6.00%	6.00%	6.00%
Add: Capital conservation buffer	--	0.00%	0.00%	1.25%	2.50%
Tier 1 capital + buffer	4.00%	4.50%	6.00%	7.25%	8.50%
Minimum total capital	8.00%	8.00%	8.00%	8.00%	8.00%
Add: Capital conservation buffer	--	0.00%	0.00%	1.25%	2.50%
Total capital + buffer	8.00%	8.00%	8.00%	9.25%	10.50%
<i>N.B.: Including maximum 2.5% countercyclical buffer</i>					13.00%

With respect to capital requirements, Basel III raises the minimum common equity capital ratio requirement expressed as a percentage of risk-weighted assets (RWA) from 2% to a base level of 4.5% by 2015.⁶³¹ It further provides for a cumulative increase of 2% in minimum Tier 1 capital, raising the minimum Tier I ratio from 4% currently to 6% by the start of 2015. Minimum Tier II capital will be reduced from 4% to 2% of RWA, maintaining the total Tier I plus Tier II capital ratio at its present 8% level through the phase-in period. In addition to imposing higher “basic” equity and Tier I capital ratios, Basel III further requires financial institutions to institute a supplementary common equity capital “conservation buffer” equivalent to an additional 2.5% of RWA to be fully implemented by the start of 2019. Thus, in total, the minimum common equity capital requirement imposed under Basel III at the conclusion of the phase-in period will amount to 7% of RWA, inclusive of the capital conservation buffer.⁶³² Once phase-in of the regime is completed by the end of 2018, minimum Tier 1 capital and total capital under Basel III will amount to 8.5% and 10.5% of RWA (*see* Figure 2.6).

Basel III further augments mandatory capital by imposing an additional capital requirement on designated global systemically important non-bank financial institutions (G-

⁶³⁰ Press Release, Minimum Capital Standards, *supra* note 622, at 7.

⁶³¹ For introductory discussion to the concept of risk-weighting, see CARNELL ET AL., *supra* note 475, at 257-63, 272.

⁶³² Press Release, Minimum Capital Standards, *supra* note 622; Caruana, *supra* note 622.

SIFIs), similar to Dodd-Frank under §165.⁶³³ In July 2011, the Basel Committee released, and the Financial Stability Board endorsed, a consultative document outlining proposed methodology for determining the global systemic importance of banks, surcharge requirement magnitudes, and arrangements to phase in these requirements.⁶³⁴ Based primarily on cross-jurisdictional activity, size, interconnectedness, substitutability, and complexity, systemically important banks will be required to hold an additional common equity buffer ranging from 1% to 2.5% of RWA.⁶³⁵

Finally, in addition to these risk-weighted capital requirements, Basel III further provides for a non-weighted Tier 1 leverage ratio, provisionally set at 3% of total assets and subject to adjustment during the phase-in.⁶³⁶ Though intended “as a backstop to the risk-based measures,”⁶³⁷ a leverage requirement that does not rely on RWA seems to run counter to the basic premise of the Basel initiative, that capital adequacy should not be judged without considering the riskiness of the assets.⁶³⁸

In addition to increasing existing capital requirements, Basel III prescribes a new discretionary “countercyclical buffer” ranging from 0% to a maximum 2.5% of common equity (or “fully loss absorbing” equivalents, i.e., Tier 1 capital) for banks located in countries where “excess credit growth...is resulting in a system wide build up of risk.”⁶³⁹ It ties the

⁶³³ Dodd-Frank Act § 165 (directing the Federal Reserve to establish “more stringent” “risk-based capital requirements and leverage limits” for bank holding companies with over \$50 billion in consolidated assets deemed systemically important); Press Release, Minimum Capital Standards, *supra* note 611; *see also* Patrikis, *supra* note 626.

⁶³⁴ BASEL COMM. ON BANKING SUPERVISION, GLOBAL SYSTEMICALLY IMPORTANT BANKS: ASSESSMENT METHODOLOGY AND THE ADDITIONAL LOSS ABSORBANCY REQUIREMENT (July 2011), <http://www.bis.org/publ/bcbs201.pdf>. In November 2011, the FSB released its first list of G-SIFIs, which included the following 29 financial institutions: Bank of America, Bank of China, Bank of New York Mellon, Banque Populaire Cde, Barclays, BNP Paribas, Citigroup, Commerzbank, Credit Suisse, Deutsche Bank, Dexia, Goldman Sachs, Group Crédit Agricole, HSBC, ING Bank, JP Morgan Chase, Lloyds Banking Group, Mitsubishi UFJ FG, Mizuho FG, Morgan Stanley, Nordea, Royal Bank of Scotland, Santander, Société Générale, State Street, Sumitomo Mitsui FG, UBS, Unicredit Group, and Wells Fargo. Fin. Stability Board, *Policy Measures to Address Systemically Important Financial Institutions* (Nov. 4, 2011), http://www.financialstabilityboard.org/publications/r_111104bb.pdf.

⁶³⁵ *Id.* Based on a current application of the assessment methodology, twenty-eight banks would be subject to a capital surcharge.

⁶³⁶ Press Release, Minimum Capital Standards, *supra* note 622.

⁶³⁷ *Id.*

⁶³⁸ *Testimony Before the S. Comm. on Banking, Housing & Urban Affairs*, 112th Cong. 18 (July 21, 2011) (statement of Hal S. Scott, Director, Comm. on Capital Mkts. Reg.), http://www.capmktreg.org/pdfs/2011.07.21_Senate_Statement.pdf.

⁶³⁹ Press Release, Minimum Capital Standards, *supra* note 622.

countercyclical buffer (but not the conservation buffer) to supervisory discretion, prescribing it for use in overheated credit markets that promote rising asset values with an accompanying procyclical increase in bank leverage. The decision to implement this buffer and the assessment of its magnitude would be made by a designated national authority identified by the Committee member jurisdiction.⁶⁴⁰ Patrikis analogizes both the countercyclical and conservation buffers to forms of loan loss reserve intended to be drawn down to absorb unanticipated credit losses.⁶⁴¹ The Basel III capital standards, including the supplementary buffers, are scheduled to be phased in gradually from January 2013 to January 2018 with some requirements in force before then (see schedule in Figure 2.6).⁶⁴²

While Basel III increases minimum capital requirements through the direct measures described above, it also effectively increases the amount of capital required by restricting the range of instruments that are eligible for inclusion in the calculation of Tier 1 capital and revising its overall approach to risk weighting.⁶⁴³ In particular, Basel III calls for eliminating certain elements from qualifying common equity Tier I capital (CET1), to be phased in gradually through 2018.⁶⁴⁴ These eliminations include certain deferred tax assets, mortgage servicing assets, and significant investments in the common shares of unconsolidated financial institutions.⁶⁴⁵ The revisions also attach more stringent risk-weightings to securitization exposures including CDOs of ABS.⁶⁴⁶ Patrikis (2010) notes that these new risk-weightings may reduce existing capital ratios of certain banks by a factor of up to one half, thus requiring them to raise a considerable amount of new capital.⁶⁴⁷ However, Patrikis's estimate may prove to be conservative, as regulators continue to review the underlying risk-weighting assumptions amidst increased scrutiny of banks' flexible calculation methodologies.⁶⁴⁸ As large banking institutions

⁶⁴⁰ See BASEL COMM. ON BANKING SUPERVISION, *BASEL III: A GLOBAL REGULATORY FRAMEWORK FOR MORE RESILIENT BANKS AND BANKING SYSTEMS* 58 (June 2011).

⁶⁴¹ Patrikis, *supra* note 626.

⁶⁴² Press Release, Minimum Capital Standards, *supra* note 622.

⁶⁴³ *Id.*; see also Press Release, Basel Comm. on Banking Supervision, Basel II Capital Framework Enhancements Announced by the Basel Committee (July 13, 2009), <http://www.bis.org/press/p090713.htm>.

⁶⁴⁴ BASEL COMM. ON BANKING SUPERVISION, *supra* note 640.

⁶⁴⁵ *Id.* at 21-27.

⁶⁴⁶ Press Release, Basel Comm. on Banking Supervision, Basel II Capital Framework Enhancements Announced by the Basel Committee, *supra* note 643; Patrikis, *supra* note 626.

⁶⁴⁷ Patrikis, *supra* note 626.

⁶⁴⁸ David Enrich & Max Colchester, *EU Banks' Risk in Eyes of Beholder*, WALL ST. J., Jun. 22, 2012, <http://online.wsj.com/article/SB10001424052702304441404577480443348931240.html>.

are currently given relative discretion over the risk weighting of their assets—through the Basel II-sanctioned “internal model method”⁶⁴⁹—the possibility exists for certain banks to underrepresent the risk-based denominator, thereby artificially bolstering reported capital ratios.⁶⁵⁰ Basel III seeks to mitigate this concern through more robust model approval processes and concrete risk-weighting measurements. Further addressing the skepticism embedded in RWA assumptions, the Federal Reserve Board has recently submitted two alternative calculation methodologies in its recent notice of proposed rulemaking.⁶⁵¹ This submission is consistent with the requirement under Title IX, §939A of the Dodd-Frank Act to remove references to credit ratings in RWA calculations.

Finally, Basel III addresses the stress-testing requirements established under Basel II through expansion of the internal capital adequacy assessment process (ICAAP). In general, stress tests are an analysis of a bank’s capital adequacy under varying adverse economic scenarios. Stress tests augment the Basel capital requirements by requiring financial institutions to plan proactively for these highly adverse events. Basel III requires banks to have a comprehensive stress-testing program that aims to address the possibility of severe shocks and changes in market conditions.⁶⁵² U.S. regulators issued a final rule in November 2011 requiring all U.S.-domiciled bank holding companies (BHCs) with consolidated assets of \$50 billion or more to submit to an annual Comprehensive Capital Analysis and Review (CCAR).⁶⁵³ Each year, covered BHCs must develop and submit a three-year capital plan to the Federal Reserve. The Federal Reserve will then carry out a supervisory stress test based on a predetermined, though not publicly disclosed, stress scenario that projects losses given the realization of a low-

⁶⁴⁹ See BASEL COMM. ON BANKING SUPERVISION, REVISIONS TO THE BASEL II MARKET RISK FRAMEWORK (Feb. 2011), <http://www.bis.org/publ/bcbs193.pdf>.

⁶⁵⁰ Patrikis, *supra* note 626.

⁶⁵¹ Bd. of Governors of the Fed Res. Sys., *supra* note 625. Under the proposal, banking institutions would be allowed to utilize either the Supervisory Formula Approach (SFA) or the simplified version of this approach (SSFA) subject to approvals.

⁶⁵² BASEL COMM. ON BANKING SUPERVISION, PRINCIPLES FOR SOUND STRESS TESTING PRACTICES AND SUPERVISION (May 2009), <http://www.bis.org/publ/bcbs147.pdf>.

⁶⁵³ See Press Release, Bd. of Governors of the Fed. Res. Sys. (Nov. 22, 2011), <http://www.federalreserve.gov/newsevents/press/bcreg/20111122a.htm>.

probability, yet realistic, event. Based on the resulting determination of the adequacy of each firm's capital plan, the BHC may be required to raise additional capital.⁶⁵⁴

However, while the aim of stress tests is to reduce uncertainty among investors regarding future losses and capital needs, the stress-test designs to date have fallen short of addressing contagion risk. Neither Basel III nor the CCAR have considered behavioral assumptions about BHC creditors and the possibility of runs by short-term creditors in the adverse scenarios.⁶⁵⁵ As such, these stress tests so far have failed to assess the impact of widespread contagion on capital adequacy. The Office of Financial Research (OFR) has pointed to two primary limitations of the current designs: (i) a lack of fire sale or run considerations and (ii) a failure to capture potential feedback effects of external shocks, such as the potential reduction of credit availability to the firm resulting from its losses.⁶⁵⁶

Since promulgation, the Basel III framework has received a vigorous critique for not providing for enough capital.⁶⁵⁷ However, Scott (2010) notes that in 2007 the average regulatory capital ratio for the top 20 U.S. banks was 11.7%, which exceeded regulatory minimums by 50%.⁶⁵⁸ By this time, the major U.S. investment banks had also implemented Basel II pursuant to regulation by the SEC.⁶⁵⁹ Yet despite being effectively compliant under the Basel II framework before the financial crisis, these institutions did not hold enough capital to survive the crisis without public support. In fact, the 2009 IMF Global Financial Stability Report found that risk-weighted capital adequacy ratios were unable to clearly identify which institutions would require government assistance, even finding that capital ratios were actually higher on average for commercial banks needing intervention.⁶⁶⁰ Furthermore, analysis by Chiaramonte and Casu (2011) finds that bank default risk as measured by CDS spreads did not correlate meaningfully

⁶⁵⁴ *Id.*

⁶⁵⁵ Board of Governors of the Fed. Res. Sys., *Comprehensive Capital Analysis and Review 2012: Methodology and Results for Stress Scenario Projections 2*, Mar. 13, 2012.

⁶⁵⁶ U.S. DEP'T OF THE TREASURY, 2012 OFFICE OF FINANCIAL RESEARCH ANNUAL REPORT TO CONGRESS (July 20, 2012), http://www.treasury.gov/initiatives/wsr/ofr/Pages/2012annual_rpt.aspx.

⁶⁵⁷ See, e.g., Martin Wolf, *Basel: The Mouse That Did Not Roar*, FIN. TIMES, Sept. 14, 2010, <http://www.ft.com/cms/s/0/966b5e88-c034-11df-b77d-00144feab49a.html>.

⁶⁵⁸ Hal S. Scott, *Reducing Systemic Risk Through the Reform of Capital Regulation*, 13 J. INT'L ECON. L. 763, 773 (2010).

⁶⁵⁹ 17 C.F.R. §§ 200.30-3, 240.3a4-2 to -6, 240.3a5-1, 240.3b-17 to -18, 240.15a-7 to -9 (2004).

⁶⁶⁰ INT'L MONETARY FUND, GLOBAL FINANCIAL STABILITY REPORT (Apr. 2009), www.imf.org/external/pubs/ft/gfsr/2009/01/pdf/text.pdf.

with regulatory capital ratios during the crisis, feeding “doubts...in relation to the efficacy of the capital index Tier 1 Ratio as a safeguard against the risk of future default.”⁶⁶¹ The fact that minimum capital requirements did not capitalize U.S. financial institutions sufficiently to avoid public support in the crisis undercuts expectations for the framework’s performance in the future. On the other hand, more may be better.⁶⁶²

One paper authored by economists at the Bank of England recently called for bank equity capital requirements of between 16% and 20% of RWA (but noted that optimal bank capital ratios might exceed these levels).⁶⁶³ A government-appointed commission of noted policymakers in Switzerland proposed heightened capital requirements for UBS AG and Credit Suisse as an additional prophylactic measure for the Swiss economy, under which both banks would be required to hold total capital of 19% and be subject to a 10% common equity minimum due to their designation as “too big to fail.”⁶⁶⁴ This “too big to fail” legislation incorporating the so-called “Swiss finish” received final approval from both houses of the Swiss parliament in September 2011,⁶⁶⁵ and became effective on March 1, 2012, although implementation will be phased in through January 1, 2019.⁶⁶⁶ The new countercyclical measures instituted to supplement Basel III’s basic common and Tier 1 requirements might confer some added support, but it is open to question whether the regulatory judgment required to determine when a national economy is experiencing “excess” credit growth will be reliable.

According to a recent Basel Committee study, “Assuming full implementation of the Basel III requirements as of 30 June 2011...Group 1 banks would have an overall shortfall

⁶⁶¹ Laura Chiamonte & Barbara Casu, *Are CDS Spreads a Good Proxy of Bank Risk?: Evidence from the Financial Crisis* 30 (2011), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1666793.

⁶⁶² However, to that end a recent empirical study by Vallascas and Hagedorff has also found that capital requirements are only loosely related to the portfolio risk of banks, concluding that Basel III is unlikely to align capital requirements with a bank’s portfolio risk. Jens Hagedorff & Francesco Vallascas, *The Risk Sensitivity of Capital Requirements: Evidence from an International Sample of Large Banks*, REV. FIN. (2011).

⁶⁶³ David Miles, Jing Yang & Gilberto Marcheggiano, Bank of England, *Optimal Bank Capital* (Discussion Paper No. 31, Apr. 2011), <http://www.bankofengland.co.uk/publications/externalmpcpapers/extmpcpaper0031.pdf>; Brooke Masters & Patrick Jenkins, *Bank Researchers Call for Doubling Equity Safety Net*, FIN. TIMES, Jan. 27, 2011, <http://www.ft.com/cms/s/0/1f4841ea-2a0b-11e0-997c-00144feab49a.html#axzz1CNpz1rPk>.

⁶⁶⁴ Neil Maclucas & Katharina Bart, *UBS, Credit Suisse Face Tough New Capital Rules*, WALL ST. J., Oct. 4, 2010, <http://online.wsj.com/article/SB10001424052748704631504575531222507779044.html>.

⁶⁶⁵ Klaus Wille, *Swiss Lawmakers Approve Curbing Risks at UBS, Credit Suisse*, BLOOMBERG, Sept. 30, 2011, <http://mobile.bloomberg.com/news/2011-09-30/swiss-lawmakers-approve-curbing-risks-at-ubs-credit-suisse>.

⁶⁶⁶ SWISS NAT’L BANK, 2012 FINANCIAL STABILITY REPORT (June 2012), http://www.snb.ch/n/mmr/reference/stabrep_2012/source/stabrep_2012.n.pdf.

of...€485.6 billion for a [common equity Tier 1] target level of 7.0% (i.e., including the capital conservation buffer); the latter shortfall already includes the [global systemically important bank] surcharge where applicable.”⁶⁶⁷ According to Barclays Capital, the top 35 U.S. banks will need to raise \$100bn and \$150bn in equity capital to comply with the Basel III capital requirements, “with 90% of the shortfall concentrated in the biggest six banks.”⁶⁶⁸

The Basel III requirements also come with high and uncertain costs to the real economy. Although the precise economic impact is uncertain, several organizations have commissioned studies to make estimates. Studies have been published by the Macroeconomic Assessment Group (MAG), established by the Basel Committee, along with the Financial Stability Board (FSB); the Institute of International Finance (IIF); the IMF; the Organization for Economic Cooperation and Development (OECD); and a panel including staff from the Federal Reserve Bank of New York, Bank of Italy, BIS, European Central Bank, European Commission, and IMF.⁶⁶⁹ All of the studies predict that Basel III will have a negative impact on GDP. The peak effect is estimated to be up to 1.1% of global GDP for each additional percentage point in bank common equity. Altogether, IIF estimates the various Basel III requirements (excluding the leverage ratio) will reduce the real GDP of the United States, the Euro Area, the United Kingdom, Switzerland and Japan by about 3.2%, leading to 7.5 million fewer jobs being created by 2015.⁶⁷⁰ In addition, the Financial Stability Board, in collaboration with the IMF and World Bank, recently published a study that identified unintended consequences of regulatory reforms to emerging market and developing economies, particularly as it pertains to trade finance and restrained international

⁶⁶⁷ BASEL COMM. ON BANKING SUPERVISION, RESULTS OF THE BASEL III MONITORING EXERCISE AS OF JUNE 30, 2011 (Apr. 2012). Group 1 banks are internationally active banks with over €3 billion in Tier 1 capital. The BCBS study had close to 100% coverage of Group 1 banks. The BCBS study included 103 Group 1 banks. *Id.*

⁶⁶⁸ Brooke Masters & Justin Baer, *US Banks Face \$100bn Basel III Shortfall*, FIN. TIMES, Nov. 22, 2010, <http://www.ft.com/intl/cms/s/0/42d42de2-f593-11d1-99d6-00144feab49a.html#axzz1y12NPZzr>.

⁶⁶⁹ INST. OF INT’L FIN., THE NET CUMULATIVE ECONOMIC IMPACT OF BANKING SECTOR REGULATION: SOME NEW PERSPECTIVES (Oct. 2010), <http://www.iif.com/download.php?id=/0eTxourA+A=>; MACROECONOMIC ASSESSMENT GROUP, BANK FOR INT’L SETTLEMENTS, FINAL REPORT: ASSESSING THE MACROECONOMIC IMPACT OF THE TRANSITION TO STRONGER CAPITAL AND LIQUIDITY REQUIREMENTS (Dec. 2010), <http://www.bis.org/publ/othp12.pdf>; Paolo Angelini et al., *Basel III: Long-Term Impact On Economic Performance And Fluctuations* (Bank Of Int’l Settlements, Working Paper No. 338, Feb. 2011); Scott Roger & Jan Vlcek, *Macroeconomic Costs of Higher Bank Capital and Liquidity Requirements* (Int’l Monetary Fund, Working Paper No. 11/103, May 2011), <http://www.imf.org/external/pubs/ft/wp/2011/wp11103.pdf>; Patrick Slovik & Boris Cournède, *Macroeconomic Impact of Basel III* (Org. for Econ. Cooperation and Dev., Econ. Dep’t Working Paper No. 844, 2011), <http://dx.doi.org/10.1787/5kghwnhkkjs8-en>.

⁶⁷⁰ Phil Suttle, Inst. of Int’l Fin., *The Cumulative Impact on the Global Economy of Changes in the Financial Regulatory Framework*, Sept. 6, 2011, <http://www.iif.com/emr/resources+1359.php>.

capital flows.⁶⁷¹ Although mostly qualitative in nature, the analysis highlights the widespread economic impact of current regulatory reform measures.

These criticisms, some alleging that Basel III prescribes requirements that are too meager and others that the requirements are too severe, illustrate the practical obstacles to capital-based solutions to systemic risk and especially financial contagion. Capital-based solutions cannot ignore the necessity of determining how much capital is enough, what instruments count as capital, and the appropriate risk-weights of different assets. These are exceedingly difficult determinations to make. Attempts to set prices for goods and services, an easier job than pricing risk, have generally failed in the past.⁶⁷² A notable example of the difficulty of these determinations was the decision by the Basel Committee not to allow contingent convertible bonds (cocos) to count toward the surcharge imposed on systemically important financial institutions (SIFIs).⁶⁷³ The Committee said “[a]n analysis of the pros and cons of high-trigger contingent capital is made difficult by the fact that it is a largely untested instrument that could potentially come in many different forms.” It limited its analysis to cocos that meet a certain set of minimum requirements. While the Committee recognized that cocos have a number of similarities to common equity (including loss absorbency, pre-positioning, and pre-funding) as well as a number of pros relative to common equity (including avoiding agency problems associated with equity finance, incentive for shareholder discipline, contingent capital holder discipline, providing market information to supervisors, and cost effectiveness relative to common equity), the Committee also identified a number of cons relative to common equity. These included the risk of trigger failure in the relatively new instruments, cost effectiveness

⁶⁷¹ Fin. Stability Bd., *Identifying the Effects of Regulatory Reforms on Emerging Market and Developing Economies: A Review of Potential Unintended Consequences* (June 19, 2012), www.financialstabilityboard.org/publications/r_120619e.pdf. Input for this study was received from national authorities in 35 EMDEs that are members of the FSB or an FSB Regional Consultative Group. The FSB additionally cautions that “[w]hile it is too early to be able to fully assess the materiality and persistence of the effects of regulatory reforms on EMDEs, it would be useful to monitor them on an ongoing basis as well as to share experiences and implementation lessons.” *Id.* at 4.

⁶⁷² See Scott, *The Reduction of Systemic Risk in the United States Financial System*, *supra* note 1, at 683; DWIGHT R. LEE & RICHARD B. MCKENZIE, *FAILURE AND PROGRESS: THE BRIGHT SIDE OF THE DISMAL SCIENCE* 56 (1993); H. Boissevain et al., *The Effectiveness of Phase II Price Controls*, 5 *INTERFACES*, Feb. 1975, at 33, 33 (maintaining that most price controls fail notwithstanding the successes of Phase II of the Economic Stabilization Program of 1971); Fiona M. Scott Morton, *The Problem of Price Controls*, *REGULATION*, Spring 2001, at 50.

⁶⁷³ BASEL COMM. ON BANKING SUPERVISION, *GLOBAL SYSTEMICALLY IMPORTANT BANKS: ASSESSMENT METHODOLOGY AND THE ADDITIONAL LOSS ABSORBENCY REQUIREMENT* (July 2011).

which may undermine the ability of the instrument to absorb losses, complexity of the instruments, risk of a “death spiral” downward pressure on equity prices as a firm approaches the conversion point, adverse signaling, and negative shareholder incentives. Based on the balance of pros and cons, the Committee decided to limit its additional loss absorbency requirement to Tier 1 common equity only and to exclude cocos. Nonetheless, the Committee agreed to continue to review contingent capital and to support its use to meet higher national loss absorbency requirements than the global requirement.

Apart from discussions of the general appropriateness of regulatory capital requirements, further criticism of the Basel III approach to capital adequacy argues that its increasing complexity may in fact be suboptimal. In particular, Haldane (2012) points out that in a financial environment filled with uncertainty, Basel III’s complex risk-weighting system for capital adequacy may be less optimal than a much simpler one.⁶⁷⁴ He finds that in the period leading up to the recent financial crisis, simple leverage ratios had greater power in predicting the failure of large global banks than the more complex risk-weighted measures of the Basel approach.⁶⁷⁵ Furthermore, regarding the definition of capital, simpler definitions of equity capital based on market prices dominate those based on the more complex accounting measures of Basel III. In short, Haldane determines that a simple market-based leverage ratio outperforms the more complex Basel III Tier 1 capital ratio by a factor of 10 to 1 as an indicator of bank solvency.⁶⁷⁶ In addition, Basel III’s increased reliance on internal risk models has led to overly complex measures with thousands, if not millions, of parameters. Calibration of these parameters will likely require decades of more data before the models are more robust than the much simpler alternatives.⁶⁷⁷ In terms of capital regulation, and in particular the Basel approach, less may be more.

In light of difficulties in making determinations about capital adequacy and concerns of complexity, one solution to improving the determination of capital adequacy is to assign a larger

⁶⁷⁴ See Andrew G. Haldane, Exec. Dir., Fin. Stability, Bank of England, Remarks at Federal Reserve Bank of Kansas City’s 36th Economic Policy Symposium: The Dog and the Frisbee (Aug. 31, 2012).

⁶⁷⁵ See *id.*

⁶⁷⁶ See *id.*

⁶⁷⁷ See *Id.*

role in the judgment to markets, an approach reflected in the CCMR's project on capital⁶⁷⁸ and proposals by Scott (2010).⁶⁷⁹ This approach will help to refine the determination of how much capital institutions should hold in normal times and to fortify them against normal economic shocks.

Proponents of enhanced capital requirements trace the origins of contagion during the financial crisis of 2007-2009 directly to suboptimal capitalization in the financial sector in the face of faltering global economic growth and collapsing residential and commercial real estate prices. This diagnosis blames the toxic combination of “excessive on- and off-balance sheet leverage...insufficient liquidity buffers [and] a procyclical deleveraging process” for spreading “lost confidence in the solvency and liquidity of many banking institutions [then] transmitted to the rest of the financial system and the real economy, resulting in a massive contraction of liquidity and credit availability.”⁶⁸⁰ The noteworthy aspect of this explanation is its connection of ex ante capital inadequacy to the transmission of contagion effects during the crisis. If this connection is accurate, then more stringent capital requirements should help reduce runs on financial institutions in the future by mitigating the incidence of insolvency and failure.

The heaviest consideration weighing against capital requirements, however, is that this connection is too attenuated to be useful during a crisis: the strategic reserve that capital supplies to financial institutions certainly *cushions* short-term creditors from having to absorb losses, perhaps deterring the impulse to run, but does not *foreclose* the risk of suffering impairment altogether. As long as a financial institution is reliant on short-term funds, in any amount, to support long-term investment, as it must necessarily be in order to conduct maturity transformation, short-term creditors who supply those funds are exposed to the potential for losses incurred through fire sales of illiquid assets to fund withdrawals of liquidity during a panic. In a crisis, the rational option will be to run. When that happens, capital requirements can certainly lower public costs by ensuring that deeper reserves of private funding and capital are

⁶⁷⁸ Comm. on Capital Mkts. Reg., *Future Research—Capital Study*, <http://www.capmktreg.org/futureresearch.html>.

⁶⁷⁹ Scott, *The Reduction of Systemic Risk in the United States Financial System*, *supra* note 1, at 682-85; Andrew Kuritzkes & Hal Scott, Op-Ed., *Markets Are the Best Judge of Bank Capital*, FT.COM, Sept. 23, 2009, <http://www.ft.com/intl/cms/s/0/2ca160b0-a870-11de-9242-00144feabdc0.html#axzz1csApxdIO>.

⁶⁸⁰ BASEL COMM. ON BANKING SUPERVISION, STRENGTHENING THE RESILIENCE OF THE BANKING SECTOR: CONSULTATIVE DOCUMENT (Dec. 2009), <http://www.bis.org/publ/bcbs164.htm>.

available to the distressed institution. What they cannot do is prevent the run in the first place, or stop it from becoming generalized to the financial system. Capital requirements implemented under Basel III also neglect non-bank financial institutions, a critical source of systemic risk in the financial crisis of 2007-2009. Considered as a solution to the problem of contagion, capital-based solutions are incomplete.

b. Ex Ante Liquidity Requirements: Basel and U.K. FSA Proposals and Capping Short-term Funding

Liquidity is a central pillar of institutional regulation slated for reform in the wake of the financial crisis. Minimum private liquidity requirements are supposed to assure financial institutions' uninterrupted holding of a pool of high-quality liquid assets that can be sold off (or pledged as collateral) to accommodate a sudden surge of withdrawals by depositors and other short-term debt holders, for example during a serious crisis involving contagion.⁶⁸¹ In principle, maintaining sufficient high-quality assets should help financial institutions to withstand periodic instability created by the dependency on short-term funds.

Initially, liquidity requirements seem to represent a more promising regulatory approach than capital since contagion originates in (and propagates through) runs that are fundamentally liquidity-driven. The main objections against the adequacy of private liquidity requirements are four-fold, however. First, like capital requirements, the liquidity proposals discussed below (with the exception of redemption restrictions and liquidity requirements for MMMFs) apply mainly to traditional banks. Second, the stock of high-quality assets that private liquidity requirements can furnish to financial institutions is limited by nature. Basel's proposal, for instance, would require banks to retain sufficient liquid assets to match net cash outflows over 30 days.⁶⁸² The Basel Committee has said it is appraising more liberal variations of this proposal, under which high-quality corporate bonds and similar securities would qualify as "liquid," as well as more conservative ones, which would employ a more restrictive definition of liquid assets. Under any definition, however, it is always possible that persistent disruption to short-term borrowing markets leading to sustained investor outflows stretching over a longer period could eventually

⁶⁸¹ Patrikis, *supra* note 626.

⁶⁸² BASEL COMM. ON BANKING SUPERVISION, INTERNATIONAL FRAMEWORK FOR LIQUIDITY RISK MEASUREMENT, STANDARDS AND MONITORING: CONSULTATIVE DOCUMENT (Dec. 2009), <http://www.bis.org/publ/bcbs165.pdf> [hereinafter BASEL COMMITTEE, INTERNATIONAL FRAMEWORK].

overrun even the strongest portfolio of liquid assets, making it difficult to liquidate even “liquid” assets and forcing financial institutions into liquidating long-term assets to meet incremental redemptions anyway. Short-term creditors of a financial institution subject to such liquidity requirements would thus still have an incentive to exit sooner, while that portfolio was still intact, rather than later, after waves of outflow exhausted it. Third, holding assets suited to meeting the purposes of liquidity requirements entails costs to financial institutions and to the economy, since every dollar of capital allocated to low-yielding, liquid, short-term securities is unavailable to finance longer-term lending to borrowers. This theoretically lowers the amount of new credit that financial institutions can create and raises the overall cost of capital to the real economy. Fourth, securing emergency liquidity to the financial system through private reserves that have to be maintained at all times, but may be exhausted by severe freeze-ups, may be less efficient than a public central bank lender-of-last-resort that would provide unlimited liquidity (albeit with adequate collateral), but only in an emergency. For these reasons, private liquidity requirements are both under-inclusive and over-inclusive: under-inclusive because they provide coverage that is limited in amount, do not apply to non-bank financial institutions, and will not always forestall runs by short-term creditors; over-inclusive because they may unnecessarily raise the cost of real economic activities that depend on the intermediation of financial institutions but do not create systemic risk.

Two proposals for reforming liquidity requirements and a proposal for regulating funding requirements are considered here.

i. Basel Liquidity Reform

The Basel Committee announced new liquidity standards for phase-in at the start of 2011, to be completed by 2015.⁶⁸³ These standards encompass two novel measures for controlling shorter- and longer-term liquidity. Basel’s shorter-term metric, known as the “liquidity coverage ratio” (LCR), requires banks to at all times hold unencumbered high quality assets sufficient to

⁶⁸³ Press Release, Basel Comm. on Banking Supervision, Report to the G20 on Response to the Financial Crisis Released by the Basel Committee (Oct. 2010), <http://www.bis.org/press/p101019.htm>; BASEL COMM. ON BANKING SUPERVISION, THE BASEL COMMITTEE’S RESPONSE TO THE FINANCIAL CRISIS: REPORT TO THE G20 (Oct. 2010), <http://www.bis.org/publ/bcbs179.pdf>.

meet all outstanding 30-day-or-fewer liabilities.⁶⁸⁴ Financial institutions that achieve compliant LCRs must hold a “stock of high quality assets” equal to 100% or more of their net cash outflows over a 30-day period.⁶⁸⁵ Maintaining a 100% LCR in principle should enable an institution to use the sale of its own assets to satisfy all potential net outflows during a full calendar month without impairing its capital by selling longer-term assets at discounted prices, giving managers and regulators breathing room to devise a comprehensive response to the crisis or to wind down the institution when necessary.⁶⁸⁶ Qualifying “high quality assets” that count toward short-term liquidity are liquid assets that can immediately be converted to cash equal to their carrying values during a crisis.⁶⁸⁷ Among other restricting criteria, qualifying assets must be unencumbered securities with low credit- and market-risk and performance that is not correlated to riskier asset classes. Further, they must be exchange-listed, trade in active and liquid markets, and easily be susceptible of valuation. Examples of high quality assets satisfying Basel’s multifactor standard are cash, central bank reserves, marketable securities with 0% Basel II risk-weightings, and domestic currency government debt.⁶⁸⁸ The effectiveness of the LCR at meeting demand for liquidity during a crisis depends on making an accurate regulatory judgment beforehand about the appropriate quantity and quality of assets that banks operating under the proposal would be required to hold. This judgment involves significant guesswork about the severity of future crises and assumes that assets thought to be of high quality today will measure up to regulatory expectations during a period of market dislocation. Likewise, to be effective, the LCR must accurately estimate the 30-day net cash outflow that would arise from a “combined idiosyncratic and market-wide shock.”⁶⁸⁹ Regulators have promulgated minimum 30-day run-off

⁶⁸⁴ BASEL COMM. ON BANKING SUPERVISION, INTERNATIONAL FRAMEWORK, *supra* note 682, at 5-19, <http://www.bis.org/publ/bcbs165.pdf>.

⁶⁸⁵ *Id.* at 5.

⁶⁸⁶ *Id.*

⁶⁸⁷ *Id.* at 7.

⁶⁸⁸ *Id.* at 9. Under Basel II’s standardized approach for calculating regulatory capital, EU member states’ sovereign debt in domestic currency is assigned a risk weight of 0%. Under this regime, even the sovereign debt of an EU state facing a major fiscal crisis (for example, Greece in 2011) would receive a 0% weighting. This type of misleading risk-weight may call into question the efficacy of an LCR metric based on a definition of high quality asset derived from Basel II. Basel II’s weighting of EU sovereign debt points to a broader potential regulatory conflict, which is also highlighted by U.S. regulators’ bullish rhetoric in the wake of S&P’s recent downgrade of the country’s credit. While regulators are tasked with developing rules to accurately risk-weight assets (including their own governments’ debt), they must contend with their potentially conflicting interest in avoiding rapid sell-offs of their own sovereign debt in the case of a downgrade or other negative indicator.

⁶⁸⁹ *Id.* at 6.

rates for various liability classes, but have provided little empirical evidence to support these stress test standards.⁶⁹⁰

To the LCR, Basel adds a longer-term metric called the “net stable funding ratio” (NSFR) designed to secure institutions with enough liquidity support for one year. The components of “stable funding”⁶⁹¹ are capital, preferred stock, other liabilities with maturities of more than one year, plus “stable” deposits.⁶⁹² All components are discounted by weightings reflective of their relative stability.⁶⁹³ One hundred percent NSFR-compliant institutions maintain stable funding levels in excess of total assets (both on- and off-balance sheet), weighted according to liquidity and resilience in a period of stress.⁶⁹⁴ Beyond LCR and NSFR, the Basel proposal introduces other measurements oriented at facilitating supervisory monitoring of institution liquidity. Their focus is on maturity (mis-)matching, wholesale funding dependency, and amount of available unencumbered assets. Finally, Basel endorses market-based liquidity monitoring using equity prices and CDS spreads.⁶⁹⁵ Although the NSFR is a valuable supplement to shorter-term liquidity requirements that will provide stability to banks over a longer period of time, it too requires regulators to make accurate forecasts about the stability of funding and the quality and liquidity of a bank’s assets during a crisis.

A recent Basel Committee Study assuming full implementation of the Basel III liquidity requirements as of June 30, 2011, found that for internationally active banks with over €3 billion in capital the aggregate LCR shortfall is €1.76 trillion and the aggregate shortfall for the NSFR is €2.78 trillion.⁶⁹⁶ However, the Basel Committee study notes, “the shortfalls in the LCR and the NSFR are not necessarily additive, as decreasing the shortfall in one standard may result in a similar decrease in the shortfall of the other standard, depending on the steps taken to decrease

⁶⁹⁰ *Id.* Indeed, in its consultative document on liquidity risk measurement, the Basel Committee has outlined run-off rates for various funding sources (e.g., minimum 7.5% for stable deposits, minimum 15% for less stable deposits, 100% for funding from repo of illiquid assets), but does not explain the methodology used to derive these rates.

⁶⁹¹ Defined as “equity and liability financing expected to be reliable sources of funds over a one-year time horizon under conditions of extended stress.” *Id.* at 20.

⁶⁹² *Id.* at 20-22.

⁶⁹³ *See id.* at 21-22 tbl.1.

⁶⁹⁴ *Id.* at 22-24.

⁶⁹⁵ *Id.* at 25-31.

⁶⁹⁶ *See* BASEL COMM. ON BANKING SUPERVISION, *supra* note 667, at 3.

the shortfall.”⁶⁹⁷ According to Barclays Capital, the largest 35 U.S. banks will need to come up with \$500 billion in cash and liquid assets to comply with the Basel III liquidity requirements, which is roughly 32% of total U.S. Treasury Bills outstanding as of July 2012.⁶⁹⁸ The Basel III liquidity requirements, combined with a growing demand for safe collateral resulting from an increase in central clearing of derivatives,⁶⁹⁹ will put further upward pressure on the prices of liquid assets, and cause further increases in funding costs for financial institutions. A recent WSJ article reports that the Basel Committee is considering reducing the liquidity requirements to make them “more realistic.”⁷⁰⁰ Given the potential concerns, central bank lender-of-last-resort facilities that accept as collateral a wider range of assets than qualify for Basel III’s liquidity requirement may be a better method of dealing with liquidity concerns. Not only would the depth of public liquidity support deter runs by short-term creditors who would otherwise have concern about an institution’s liquidity, but it could also do so without negatively affecting asset prices.

ii. U.K. FSA Liquidity Reform

The second proposal for reform, authored by the U.K. Financial Services Authority (FSA), echoes the basic policies of Basel. For example, the FSA introduces rule sets requiring institutions to hold adequate inventories of high-quality assets including government debt and central bank reserves.⁷⁰¹ It tethers the expected magnitude of institutional liquidity buffers to a multifactor combination of an institution’s risk management practices, stress test performance, and “contingency funding plans.”⁷⁰² Financial institutions must turn over existing liquidity buffers in the private markets on a regular basis. Periodically, they are expected to access emergency central banking facilities, including the Bank of England and Federal Reserve discount windows and the European Central Bank’s marginal lending facility.⁷⁰³ Mandating regular access to the private and public markets is intended to reduce negative signaling

⁶⁹⁷ *Id.* at 22.

⁶⁹⁸ Masters & Baer, *supra* note 668; SIFMA, *U.S. Treasury Securities Outstanding*, <http://www.sifma.org/uploadedFiles/Research/Statistics/StatisticsFiles/TA-US-Treasury-Debt-Outstanding-SIFMA.xls> (noting total outstanding amount of U.S. Treasury Bills was \$1,581 billion as of July 2012).

⁶⁹⁹ See Hobson, *supra* note 447.

⁷⁰⁰ See David Enrich & Victoria McGrane, *Regulators Weigh Easing of Global Bank Rules*, WALL ST. J., June 15, 2012.

⁷⁰¹ FIN. SERVS. AUTHORITY, POLICY STATEMENT 09/16: STRENGTHENING LIQUIDITY STANDARDS 45 (Oct. 2009), http://www.fsa.gov.uk/pubs/policy/ps09_16.pdf.

⁷⁰² *Id.*

⁷⁰³ *Id.* at 46.

associated with the stigma of emergency borrowing.⁷⁰⁴ The FSA proposal directs financial institutions to undergo stress tests and develop contingency plans for navigating severe liquidity freeze-ups. Like Basel, the FSA introduces novel liquidity reporting requirements, metrics, and minimum standards.⁷⁰⁵

iii. Capping Short-term Funding

A third approach, endorsed by the U.K. Independent Commission on Banking in its September 2011 “Vickers Report,” would ensure bank liquidity by placing a cap on the portion of a bank’s balance sheet that can be funded with short-term liabilities. A focus on the wholesale short-term funding of financial institutions is supported empirically by a number of recent academic studies, which show that banks more reliant on such funding are more likely to suffer distress.⁷⁰⁶ The IMF has found that commercial and investment banks that required government assistance during the recent financial crisis held significantly higher ratios of short-term debt to total debt than did banks that did not require assistance, reinforcing the importance of solutions targeting short-term funding.⁷⁰⁷ Short-term wholesale funding has also been found to be the best predictor of a bank’s contribution to systemic risk.⁷⁰⁸ While the Vickers Report focuses primarily on a proposed system of “ring-fencing” depository banking businesses from investment banking businesses, it also seeks to place a limit on the amount of short-term wholesale funding a ring-fenced bank can raise.⁷⁰⁹ The report recommends:

[I]n addition to existing regulations backstop limits should be placed on the absolute level of wholesale funding permitted. A cap on the absolute level would act as a check against attempts to arbitrage more complex regulations... The limit should be calibrated so that it is non-binding for a bank as of today but guards against de-stabilising wholesale funded growth in the future.⁷¹⁰

⁷⁰⁴ *Id.*

⁷⁰⁵ *Id.*

⁷⁰⁶ See e.g., Asli Demirgüç-Kunt & Harry Huizinga, *Bank Activity and Funding Strategies: The Impact on Risk and Returns*, 98 J. FIN. ECON. 626 (Dec. 2010) (finding short-term non-deposit funding increases certain measures of bank fragility); Lev Ratnovski & Rocco Huang, *Why Are Canadian Banks More Resilient?*, (IMF Working Paper No. 09/152, July 2009) (finding that the ratio of depository funding to total assets was an “important predictor of bank resilience during the turmoil.”)

⁷⁰⁷ IMF GLOBAL FINANCIAL STABILITY REPORT (Apr. 2009), *supra* note 660.

⁷⁰⁸ See López-Espinosa, Germán, Antonio Morena, Antonio Rubia & Laura Valderrama, *Short-Term Wholesale Funding and Systemic Risk: A Global CoVaR Approach*, 36 J. BANKING & FIN. (2012).

⁷⁰⁹ INDEP. COMM’N ON BANKING, FINAL REPORT RECOMMENDATIONS 61-62 (Sept. 2011), <http://bankingcommission.s3.amazonaws.com/wp-content/uploads/2010/07/ICB-Final-Report.pdf>.

⁷¹⁰ *Id.* at 61-62.

Overall, the Vickers Report introduces an approach that aims to minimize the flight of short-term creditors that left many apparently solvent financial institutions facing potentially ruinous liquidity crunches in late 2008. However, consideration of a short-term funding cap would require a more detailed proposal; one that suggests an appropriate short-term wholesale funding limit, provides a detailed system of implementation, and analyzes any consequent effects of the higher average funding costs on financial institutions. Furthermore, while the Vickers proposal only considers the maturity of liabilities, a more sensible and effective approach to capping short-term funding may be to focus on the maturity mismatch between an institution's assets and its short-term liabilities. Given the role of reliance on short-term funding in transmitting contagion, proposals such as this to limit that reliance may be prudent.

In addition to the proposal in the Vickers Report, Paul Tucker, the Deputy Governor of the Bank of England, has highlighted the importance of policy that focuses on “the liability structure and sources of funding of the banking system.”⁷¹¹ In this manner, Mr. Tucker is particularly concerned with the problems posed by contagious runs on the providers of short-term funding (such as MMMFs) that then propagate throughout the financial system due to liability interconnectedness. In expressing a concern about the ability of the SEC to safeguard these sources of short-term funding, with particular reference to the MMMF industry, he suggests limiting “the extent to which banks [can] fund themselves short-term from US money funds and other fragile/flighty sources....”⁷¹² The aim of his policy is not to target the U.S. MMMF industry per se, but rather to ensure the prudence of banks that fund themselves in the short-term markets.

Along with the Vickers Report and Mr. Tucker's proposal, various academic studies have suggested indirect ways in which restrictions on short-term funding might be implemented. Many of these proposals are aimed at reforming the use of repurchase agreements and money market funds, which dominate the short-term financing markets. Asset backed commercial paper

⁷¹¹ Paul Tucker, *supra* note 533.

⁷¹² *Id.*

has largely disappeared as a funding instrument for financial companies since the financial crisis.⁷¹³

Hoening and Morris (2011) recommend reducing banks' reliance on short term funding by rolling back 2005 amendments to the U.S. bankruptcy code that exempted repurchase agreements on mortgage-related assets from bankruptcy requirements.⁷¹⁴ Prior to 2005, collateral in repurchase agreement transactions eligible for the automatic stay was limited to U.S. government and agency securities, bank certificates of deposits, and bankers' acceptances. Rolling back these exemptions would reintroduce counterparty risks to these repurchase agreements and arguably reduce financial institutions' reliance on repurchase agreements.

Gorton and Metrick (2010) have called for strict regulation of securities used as collateral in repurchase agreements, limiting such collateral to only the highest quality securities for banks.⁷¹⁵ Krishnamurthy, Nagel, and Orlov (2012) found that during the financial crisis the contraction in repurchase agreements played a significant role for systemically important dealer banks. For example, nearly half of the repurchase agreements of Merrill Lynch, Goldman Sachs and Citigroup with money market funds were backed by non-agency MBS/ABS and corporate debt, and almost all of this financing disappeared during the crisis.⁷¹⁶ The FSB recently recommended that regulators should consider mandatory haircuts on collateral for all repurchase agreements.⁷¹⁷ This is consistent with recent work by Geanakoplos (2010).⁷¹⁸

There are also alternative proposals intended to address short term funding markets more generally that would certainly affect banks' reliance on short term funding. For example, Ricks (2010) recommends that in order for an entity to significantly rely on any form of short-term funding it must apply for a license. Such a license would come with extensive activities restrictions, agency supervision, capital requirements, deposit insurance and access to a lender of

⁷¹³ Thomas M. Hoening & Charles S. Morris, *Restructuring the Banking System to Improve Safety and Soundness* (May 2011).

⁷¹⁴ *Id.*

⁷¹⁵ Gary Gorton & Andrew Metrick, *Regulating the Shadow Banking System*, 41 BROOKINGS PAPERS ON ECON. ACTIVITY 261 (2010).

⁷¹⁶ Arvind Krishnamurthy, Stefan Nagel & Dmitry Orlov, *Sizing up Repo* (NBER Working Paper No. 17768, Jan. 2012).

⁷¹⁷ FIN. STABILITY BD., *SHADOW BANKING: STRENGTHENING OVERSIGHT AND REGULATION* 23 (2011).

⁷¹⁸ John Geanakoplos, *The Leverage Cycle* (Cowles Found., Discussion Paper No. 1304, 2010), <http://cowles.econ.yale.edu/~gean/art/p1304.pdf>.

last resort.⁷¹⁹ Gorton and Metrick (2010) recommend a similar regulatory regime for any entity funding itself in the short-term secured financing market. The FSB has also made broad recommendations regarding short-term funding, suggesting that regulators should ensure any bank-affiliated entities that fund themselves with short-term debt are consolidated onto a bank's balance sheet.

Finally, there have been suggestions that firms' reliance on short-term funding can be reduced by the government "crowding out" their issuance of short-term debt. Pozsar (2011) has suggested that "one way to manage the size of the shadow banking system is by adopting the supply management of treasury bills as a macro prudential tool."⁷²⁰ Greenwood, Hanson, and Stein (2010) assert that the government could reduce the size of short-term funding markets by tilting its issuance more towards short maturities. This solution is premised on the idea that "government may have a comparative advantage relative to the private sector in bearing refinancing risk, and hence should aim to partially crowd out the private sector's issuance of short-term debt."⁷²¹ This approach of "crowding out" the private sector incentive would affect not only banks but also the shadow-banking sector, reducing the likelihood of liquidity-driven fire sales. This recommendation is intended to address the widely accepted notion that short term funding markets developed in part due to an increase in demand from foreign investors and institutional cash pools intent on acquiring secured short-term AAA assets.⁷²²

c. Ex Post Resolution Procedures

From the perspective of systemic risk regulation, the protection of short-term creditors of financial institutions should be the prime function that is served by resolution procedures. By design, capital and liquidity requirements reach their useful limit when the financial institutions that are subject to them fail, since at this point there is not enough capital or liquid assets

⁷¹⁹ See Morgan Ricks, *A Regulatory Design for Monetary Stability* (John M. Olin Ctr. for Law, Econ., and Bus., Discussion Paper No. 706, 2011).

⁷²⁰ Zoltan Pozsar, *Institutional Cash Pools and the Triffin Dilemma of the U.S. Banking System 1* (IMF Working Paper No. 11/190, 2011).

⁷²¹ See Greenwood et al., *A Comparative-Advantage Approach to Government Debt Maturity* (Harv. Univ. Discussion Paper, 2012).

⁷²² See Ben S. Bernanke et al., *International Capital Flows and the Returns to Safe Assets in the United States, 2003 - 2007* (Bd. of Governors of the Fed. Reserve Sys., Int'l Fin. Discussion Papers, No. 1014, 2011), <http://www.federalreserve.gov/pubs/ifdp/2011/1014/ifdp1014.pdf>.

available for sale to cushion short-term creditors from the risk of having to absorb losses. If adverse market forces overwhelm capital and liquidity buffers, or if for any reason short-term creditors anticipate that they could be overwhelmed, neither is likely to stop a run. Resolution procedures that are sensitive to this limitation might succeed at limiting contagion by restructuring failed financial institutions in a way that protects short-term debt holders even after capital and liquidity buffers have been overridden. But resolution rules that exempt short-term debt holders from impairment by definition limit the amount of losses that can be imposed on failed financial institutions, possibly creating a need for public support. Furthermore, if the short-term creditors are unsecured, such resolution rules may violate contractually established priorities that would normally apply in bankruptcy. Finally, blanket protection for short-term creditors may make the system even more prone to runs by encouraging creditors to be even more short-term than at present.

The recurring criticism of the different sets of resolution strategies discussed below is that they all refuse to accept the public costs associated with this trade-off, at best providing indirect or incomplete protection to short-term debt holders (for example, by imposing first losses on long-term debt holders or by reserving limited room for discretionary carve-outs from normal priority rules in bankruptcy) that falls far short of what probably is required to deter a run driven by fear of insolvency. Rather than explicitly protecting short-term debt holders from loss during the reorganization of a failed financial institution in a manner that is certain, automatic, and non-discretionary, they instead prioritize avoiding public support and internalizing costs to all debt and equity holders. In doing so they increase rather than offset the risk of contagion by jeopardizing short-term creditors and encouraging preemptive withdrawals.

Out of the many different resolution strategies that have been put forward in response to this aspect of the financial crisis of 2007-2009, this study considers:⁷²³

- Issuing contingent capital to enhance loss absorption at senior, non-equity levels of the institutional capital structure,⁷²⁴

⁷²³ Citations to the main sponsors of these strategies are included in the fuller discussion of each that follows below.

⁷²⁴ Evaluation of contingent capital is reserved for this section, rather than the discussion of capital buffers to which it arguably belongs, because of its close substantive relation to creditor bail-ins.

- Employing creditor “bail-ins” to force contingent-capital-inspired loss absorption upon debt holders without the necessity of proceeding through a disruptive judicial or administrative resolution process;
- Ring-fencing seriously impaired “bad” assets through good-bank/bad-bank bifurcated resolution structures;
- Instituting living wills, prepackaged resolution plans formulated by systemically important institutions as an aid to orderly wind-ups during a crisis; and
- Use of the Orderly Liquidation Authority under Title II of Dodd-Frank to resolve non-bank financial institutions that are deemed systemically important.

Several of these strategies have already been incorporated into the regulatory framework of Dodd-Frank, which empowers the Federal Reserve and FSOC to require institutions to issue contingent capital after a feasibility study,⁷²⁵ provides for the formulation of living wills by systemically important financial institutions,⁷²⁶ and directs the FDIC to develop rules implementing the Orderly Liquidation Authority.⁷²⁷ Discussion of two other strategies that are not contemplated by the Dodd-Frank reforms, the expanded use of insurance for short-term liabilities and strengthened lender-of-last-resort powers, is reserved to Part II.B.2, since neither is a resolution procedure.

i. Contingent Capital Instruments

The term “contingent capital” is the name given to a group of long-term hybrid debt instruments, in the past used by insurance companies to manage loss exposures and now being tested in the banking industry. The distinguishing characteristic of all contingent capital instruments is an embedded equity conversion provision, triggered automatically after the

⁷²⁵ Dodd-Frank Act §§ 115(c), 165(c). FSOC can recommend contingent capital only after conducting a study to be submitted to Congress within two years of the legislation’s enactment. *Id.* § 115(c).

⁷²⁶ *Id.* § 165(d). On September 13, 2011, the FDIC approved two sets of rules mandating living wills: one governs large bank holding companies, the other addresses the depository arms of the largest thirty-seven U.S. banks (those with over \$50 billion in total assets). Press Release, Fed. Deposit Ins. Corp., FDIC Board Approves Interim Final Rule Requiring Resolution Plans for Insured Depository Institutions over \$50 Billion (Sept. 13, 2011), <http://www.fdic.gov/news/news/press/2011/pr111150.html>; Press Release, Fed. Deposit Ins. Corp., FDIC Adopts Final Rule on Resolution Plans Under Dodd-Frank (Sept. 13, 2011), <http://www.fdic.gov/news/news/press/2011/pr111151.html>.

⁷²⁷ The FDIC has issued a final rule regarding certain orderly liquidation authority provisions, effective August 15, 2011. 12 C.F.R. § 380 (2011).

issuer's financial profile deteriorates below a predefined threshold.⁷²⁸ Conversion is mandatory, not optional. Contingent capital instruments incorporate long-term maturities (for example, two series of contingent capital notes issued by European banking institutions are scheduled to mature after ten years) that enhance the total loss-absorbing capital available to financial institutions that issue them, thus protecting all non-convertible liabilities (including, indirectly, shorter-term debt) against losses large enough to overwhelm undiluted common equity. Since contingent capital is long-term debt, it is more economic to issue than equity given tax regimes permitting the deduction of interest on debt but not dividends on equity. Further, since contingent capital instruments convert automatically, they can absorb losses outside of a formal resolution process. In effect, they streamline loss absorption (and thus internalization of costs) beyond the common equity layer, free from the disturbance to short-term debt holders, and to the financial system, of the disruption and losses incurred in bankruptcy. For this reason, and owing to its substantive similarity to creditor bail-ins, discussed below, contingent capital is analyzed in this study as a resolution procedure rather than viewed as being simply an exotic variant of normal capital.

Analogous instruments predate the financial crisis in concept and practice. Reinsurance companies use contingent capital to manage risk from large, discrete loss exposures.⁷²⁹ As one example, in 1997 LaSalle Re Holdings Ltd. issued \$100 million of contingent capital structured as convertible preferred shares to cover “a major catastrophe or series of large catastrophes that cause[d] substantial losses” in the future.⁷³⁰ The adoption of contingent capital by the banking

⁷²⁸ Ass'n for Fin. Mkts. in Eur., *The Systemic Safety Net: Pulling Failing Firms Back From the Edge* 7 (Aug. 2010) [hereinafter AFME], <http://www.afme.eu/WorkArea/DownloadAsset.aspx?id=197>.

⁷²⁹ *Id.*; see, e.g., Christopher L. Culp, *Contingent Capital: Integrating Corporate Financing and Risk Management Decisions*, 15 J. APPLIED CORP. FIN. 46 (Spring 2002), <http://www.rmcsinc.com/articles/JACF151.pdf> (surveying forms of contingent capital); Russ Banham, *Just-in-Case Capital*, CFO MAGAZINE, June 1, 2001, http://www.cfo.com/article.cfm/2996186/c_2984346/?f=archives; Robert Hunter, *Preparing for Catastrophe: Can the Capital Markets Save the Insurance Industry From the Next Big One?*, DERIVATIVESSTRATEGY.COM, Nov. 1998, <http://www.derivativesstrategy.com/magazine/archive/1998/1198fea3.asp> (listing contingent capital deals involving reinsurers); Gallagher Polyn, *Swiss Re Strikes \$150 Million Contingent Capital Deal*, RISK.NET, Mar. 1, 2002, <http://www.risk.net/risk-magazine/news/1503664/swiss-re-strikes-usd150-million-contingent-capital-deal>.

⁷³⁰ See *LaSalle Re Signs \$100 Million Contingent Capital Program*, BUSINESS WIRE, Aug. 5, 1997, http://findarticles.com/p/articles/mi_m0EIN/is_1997_August_5/ai_19650965; Joe Niedzielski, *Aon-LaSalle Re Post \$100M Package*, NAT'L UNDERWRITER PROP. & CASUALTY, Aug. 6, 1997, <http://www.propertycasualty360.com/1997/08/06/aonlasalle-re-post-100m-package>.

industry is a more recent development that remains at a largely conceptual stage.⁷³¹ Variations of contingent capital instruments customized for bank and non-bank financial institutions have, however, gained traction with some policymakers.

Figure 2.7: Contingent Convertible Issuances (as of 7/31/12)⁷³²
\$ millions

Issue Date	Issuer	Issue Size
Nov. 2009	Lloyds Banking Group	\$13,700
Mar. 2010	Rabo Bank	1,250
Jan. 2011	Rabo Bank	2,000
Feb. 2011	Credit Suisse	2,000
Feb. 2011	Credit Suisse	6,200
May 2011	Bank of Cyprus	890
Sep. 2011	ANZ	1,250
Feb. 2012	UBS	2,000
Feb. 2012	ZKB	590
Mar. 2012	Credit Suisse	750
Mar. 2012	Macquarie	250

Figure 2.7 shows a comprehensive list of contingent convertible issuance as of July 2012. All of such issuance has been in Europe and not the United States. In Europe, while usage is still limited, some financial institutions have begun experimenting with contingent capital. Lloyds Banking Group issued \$13.7 billion in 10-year contingent capital bonds as part of a debt exchange in November 2009.⁷³³ Conversion of the bonds is triggered after Tier 1 capital falls to less than 5% of total RWA.⁷³⁴ In March 2010, the Dutch financial services firm Rabobank issued \$1.25 billion 6.875% 10-year “senior contingent notes” (SCNs), basing conversion on the firm’s

⁷³¹ See, e.g., Mark J. Flannery, *No Pain, No Gain: Effecting Market Discipline via Reverse Convertible Debentures*, in CAPITAL ADEQUACY BEYOND BASEL: BANKING, SECURITIES AND INSURANCE (Hal S. Scott ed., 2005) (proposing reverse convertible debentures for large financial institutions convertible based on pre-established market capital ratios as a mitigant against the costs of financial distress); John C. Coffee, Jr., *Bail-ins Versus Bail-outs: Using Contingent Capital to Mitigate Systemic Risk* (Columbia Univ. Center for Law & Econ. Studies, Working Paper No. 380, Oct. 2010), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1675015 (proposing contingent capital convertible into senior preferred stock).

⁷³² Jose Manuel Corcuera et al., *Pricing of Contingent Convertibles under Smile Conform Models* (May 3, 2012), <http://www.maths.bath.ac.uk/~ak257/WienerHopfCoCo12.pdf>.

⁷³³ John Glover, *Lloyds to Raise Capital From CoCo Securities, Stock*, BLOOMBERG, Nov. 3, 2009, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aoC.bktCZJ1o>.

⁷³⁴ *Id.* For description of core terms, see AFME, *supra* note 728, at 22.

equity capital ratio.⁷³⁵ Since then, Credit Suisse has indicated that it is considering issuance of up to \$30 billion in contingent capital bonds over several years.⁷³⁶ In early 2011, it began implementing this plan, announcing a \$6.2 billion issuance of contingent convertible bonds, offered in an exchange for existing hybrids held by investors Qatar Holding and Olayan Group. The notes pay coupon rates of 9.0% and 9.5%.⁷³⁷ Credit Suisse also issued \$2 billion in 7.125%⁷³⁸ 30-year notes in February 2011 and \$750 million in 7.875%⁷³⁹ 10-year notes in March 2012, both of which convert to equity should Credit Suisse's common equity Tier 1 capital fall below 7%.⁷⁴⁰ ZKB and Macquarie have also issued \$590 million and \$250 million of contingent convertible notes respectively in 2012, and UBS issued \$2 billion in 7.5%⁷⁴¹ 5-year notes with a 5% common equity Tier 1 capital trigger.⁷⁴² Finally, Barclays Capital has suggested it will structure bonus compensation to senior managing directors to include payment using convertible debt instruments.⁷⁴³ As can be seen from the Figure 2.7 data, the issuance of contingent capital instruments has slowed in 2012.

Using Tier 1 capital or any measure of regulatory capital to govern conversion presupposes correctly determining the appropriate regulatory capital ratio, an imposing challenge at the center of the reform of capital requirements discussed above. Nonetheless, policymakers in

⁷³⁵ Press Release, Rabobank Successfully Issues Senior Contingent Notes (Mar. 12, 2010), http://www.rabobank.com/content/news/news_archive/005-RabobanksuccessfullyissuesSeniorContingentNotes.jsp. Conversion of the SCNs is triggered if Rabobank's equity ratio falls below 7%.

⁷³⁶ Justin Baer et al., *Credit Suisse Considers Early Coco Issue*, FIN. TIMES, Dec. 12, 2010, <http://www.ft.com/intl/cms/s/0/93464bae-062b-11e0-976b-00144feabdc0.html#axzz1YWJwFBBeh>.

⁷³⁷ Jennifer Hughes & Patrick Jenkins, *Credit Suisse to Test Coco Market with \$7bn Issue*, FIN. TIMES, Feb. 14, 2011.

⁷³⁸ Jonathan Penner, *CS CoCo Pops Up with Biggest Swiss Capital Deal*, INT'L FIN. REV., Mar. 12, 2012, <http://www.ifre.com/cs-coco-pops-up-with-biggest-swiss-capital-deal/21005473.article>.

⁷³⁹ Matthew Attwood & Jane Merriman, *Credit Suisse Steps Up CoCo Pace with \$2 Bln Bond*, REUTERS, Feb. 17, 2011, <http://www.reuters.com/article/2011/02/17/creditsuisse-cocos-idUSLDE71G0R420110217>.

⁷⁴⁰ *Supra* note 732.

⁷⁴¹ Helene Durand, *UBS Opens Books for First Low-trigger CoCo Issue*, INT'L FIN. REV., Feb. 14, 2011, <http://www.ifre.com/ubs-opens-books-for-first-low-trigger-coco-issue/20048682.article>.

⁷⁴² *Supra* note 732.

⁷⁴³ Rob Cox, *At Barclays, A Pay System That May Please*, N.Y. TIMES, Dec. 5, 2010, <http://www.nytimes.com/2010/12/06/business/global/06views.html>; Megan Murphy & Jennifer Hughes, *Barclays Causes a Stir with Cocos Plan*, FIN. TIMES, Jan. 24, 2011.

the United States⁷⁴⁴ and internationally,⁷⁴⁵ including Federal Reserve officials William Dudley and Daniel Tarullo, have at times signaled approval of contingent capital. Title I, §165(c) of Dodd-Frank echoes enthusiasm among regulators, provisionally authorizing the Federal Reserve to require systemically important financial institutions to issue contingent capital instruments⁷⁴⁶ following a feasibility study conducted by FSOC.⁷⁴⁷ With the so-called “Swiss finish” described in Part II.B.1.a, Swiss policymakers have offered the most significant regulatory and legislative endorsement of contingent capital. Under the new Swiss regime, on top of the Basel III Tier 1 common ratio of 4.5%, the two systemically important Swiss banks, Credit Suisse and UBS, will be required to maintain an 8.5% capital conservation buffer, up to 3% of which may consist of contingent capital that converts to equity when Tier 1 common falls below 7% of RWA (“high trigger cocos”).⁷⁴⁸ The remaining 6% of RWA progressive surcharge may consist of contingent capital that converts when the Tier 1 common ratio falls below 5% (“low trigger cocos”).⁷⁴⁹

Nonetheless, other major regulatory developments over the past couple years may suggest waning international support for contingent capital. First, in February 2011, then FDIC Chairman Sheila Bair noted that while contingent convertible debt might be worth exploring as a form of incentive compensation, convertible debt should not count toward capital requirements.⁷⁵⁰ Then, in July 2011 the Basel Committee announced that the capital buffer for systemically important banks would be composed only of Tier 1 common equity, rejecting the use of contingent capital as an effective SIFI surcharge.⁷⁵¹ In a similar fashion, the September 2011 “Vickers Report,” issued by the U.K.’s Independent Commission on Banking, did not

⁷⁴⁴ See, e.g., Damian Paletta, *Fed’s Tarullo Talks Up ‘Contingent’ Capital Requirement*, WALL ST. J., Oct. 8, 2009, <http://blogs.wsj.com/economics/2009/10/08/feds-tarullo-talks-up-contingent-capital-requirement/?KEYWORDS=%22contingent+capital%22>; William C. Dudley, President and C.E.O., Fed. Reserve Bank of N.Y., Remarks at the Institute of International Bankers Membership Luncheon: Some Lessons from the Crisis (Oct. 13, 2009), <http://www.newyorkfed.org/newsevents/speeches/2009/dud091013.html>.

⁷⁴⁵ See, e.g., Adam Bradbery & Natasha Brereton, *Financial Stability Board’s Draghi Praises Contingent Capital for Banks*, WALL ST. J., Dec. 8, 2009, <http://blogs.wsj.com/source/2009/12/08/financial-stability-boards-draghi-praises-contingent-capital-for-banks/?KEYWORDS=%22contingent+capital%22>.

⁷⁴⁶ Dodd-Frank Act § 165(c).

⁷⁴⁷ Dodd-Frank Act § 115(c).

⁷⁴⁸ Swiss Fin. Mkt. Supervisory Auth., *Addressing “Too Big To Fail”: The Swiss SIFI Policy* 12 (June 23, 2011), <http://www.finma.ch/e/finma/publikationen/Documents/be-swiss-SIFI-policy-june-2011-summary-20110624-e.pdf>.

⁷⁴⁹ *Id.* FINMA’s planned “Swiss finish” effectively amounts to a Tier 1 common ratio of 10% of RWA, 3% of RWA in high trigger cocos, and 6% of RWA in low trigger cocos.

⁷⁵⁰ Dave Clarke, *FDIC’s Bair Eyes CoCos for Bank Bonuses*, REUTERS, Feb. 28, 2011, <http://www.reuters.com/article/2011/02/28/us-finance-summit-bair-debt-idUSTRE71R4CE20110228>.

⁷⁵¹ See *supra* Part II.B.1.a.

recommend adoption of contingent capital and instead endorsed a form of “bail-in.”⁷⁵² Finally, the Federal Reserve’s June 2012 proposed rules regarding the implementation of Basel III in the U.S. reject the inclusion of contingent convertible instruments in Tier 1 capital, although a white paper on convertible debt is forthcoming that may offer hope for the allowance of contingent convertibles in Tier 2 capital.⁷⁵³

For a number of reasons, contingent capital supplies an attractive complement to common equity and non-convertible long-term debt. It minimizes the public externalities and market disruption of putting a systemically important financial institution through conservatorship or receivership.⁷⁵⁴ Automating the restructuring motivates bondholders (who fear conversion) and equity holders (who fear dilution) to monitor risk-taking by issuers.⁷⁵⁵ The current yield on contingent capital instruments serves as an objective leading indicator of the market’s judgment of the issuer’s financial strength. Contingent capital is cost-effective for issuers relative to permanent equity,⁷⁵⁶ but more expensive than non-convertible debt, supplying an ex ante source of market discipline and corresponding reduction in public subsidies to issuers.⁷⁵⁷ And, as discussed above, the loss absorbency it confers can shield short-term debt holders along with other creditors supplying credit not subject to conversion from impairment.⁷⁵⁸ Finally, contingent capital has an established record of performance in the insurance industry, is praised by regulators, is authorized by Dodd-Frank, and could be implemented swiftly.

But serious practical obstacles to operationalizing contingent capital must be overcome before these potential benefits can be realized: (1) the breadth of demand from buyers, (2) the appropriate ratings and capital treatment, and (3) the design of an effective conversion trigger.

⁷⁵² Michael Shemi, *U.K.’s Contingent Capital Promise is Empty*, AM. BANKER, Sept. 16, 2011, <http://www.americanbanker.com/bankthink/Vickers-report-independent-commission-on-banking-UK-contingent-capital-1042272-1.html>.

⁷⁵³ Aimee Donnellan, *FIG/Covered Wrap: Issuance on Hold as Rally Peters Out*, REUTERS, June 18, 2012.

⁷⁵⁴ BASEL COMM. ON BANKING SUPERVISION, PROPOSAL TO ENSURE THE LOSS ABSORBENCY OF REGULATORY CAPITAL AT THE POINT OF NON-VIABILITY 1 (Aug. 2010) [hereinafter BASEL COMM., LOSS ABSORBENCY], <http://www.bis.org/publ/bcbs174.pdf>.

⁷⁵⁵ *Id.* at 9.

⁷⁵⁶ Dudley, *supra* note 744; *see also* AFME, *supra* note 728, at 5 (noting that contingent capital “could serve as a bridge between the prudential benefits of higher capital levels and the negative growth consequences of increased capital requirements”).

⁷⁵⁷ BASEL COMM., LOSS ABSORBENCY, *supra* note 754, at 9.

⁷⁵⁸ AFME, *supra* note 728, at 7.

Strong demand for contingent capital is essential to realizing the cost savings that these instruments offer relative to equity. Whether contingent capital instruments can be marketed at economic prices that stimulate sufficient investor appetite depends largely on their treatment by regulators and rating agencies, which has yet to be determined. Recent contingent convertible issuances show that investor demand is heavily dependent on the particular structure of the contingent capital instruments, while the structure generally hinges on the constraints imposed by regulators and ratings agencies. Bert Bruggink, chief financial officer of Rabobank, reported ambivalence on the part of buyers about pricing the SCNs: “We met people who argued the pricing was completely wrong—overpriced—and others surprised we were even willing to pay a premium to our senior debt.”⁷⁵⁹ Similarly, a disappointing UBS issuance in February 2012 shows that in some cases there is weak demand for the particular contingent convertible structures that banks are able to offer.⁷⁶⁰ Weak demand for contingent convertibles is partially explained by the fact that many current institutional investors that comprise the market for *non*-convertible subordinated debt instruments (classified as Tier 2 debt under the existing Basel framework)⁷⁶¹ face statutory restrictions on owning common stock or convertible instruments.⁷⁶² Other investors might be reluctant to manage the tail-risk associated with conversion as a matter of investment policy.⁷⁶³ Excluding these buyers from the marketplace could narrow the prospective investor base for contingent capital to pure fixed income funds and hedge funds with investment mandates that extend affirmatively to hybrid, convertible debt, and equity instruments.⁷⁶⁴ To overcome these obstacles and entice more demand from buyers, issuers might be tempted to create unrealistically loose trigger thresholds under which conversion is unlikely, destroying the

⁷⁵⁹ Jennifer Hughes, *Rabobank Warns of ‘Dangerous’ Bail-ins*, FIN. TIMES, Nov. 8, 2010.

⁷⁶⁰ Helene Durand, *After-Market Mars UBS Bank Capital First*, REUTERS, Feb. 17, 2012, <http://www.reuters.com/article/2012/02/17/ubs-tier-idUSL5E8DG50E20120217>.

⁷⁶¹ See BASEL COMM. ON BANKING SUPERVISION, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS, *supra* note 629, at 4-7, 14-16 (defining Tier 2 capital as undisclosed reserves, asset revaluation reserves, general loan-loss reserves, hybrid capital instruments, and subordinated debt).

⁷⁶² Simon Nixon, *Lloyds Banking on Contingent Capital for Escape*, WALL ST. J., Nov. 2, 2009, <http://online.wsj.com/article/SB125713423970322203.html>; BASEL COMM., LOSS ABSORBENCY, *supra* note 754, at 11-12.

⁷⁶³ Simon Nixon, *Lloyds Banking on Contingent Capital for Escape*, *supra* note 762; BASEL COMM., LOSS ABSORBENCY, *supra* note 754, at 11-12; *see also* Alex Monro, *New Basel Proposals Threaten Bank Sub Debt, Investors Warn*, RISK.NET (Aug. 26, 2010), <http://www.risk.net/credit/news/1729774/new-basel-proposals-threaten-bank-sub-debt-investors-warn>.

⁷⁶⁴ *See, e.g.*, Tracy Alloway, *Adventures in Hybrid Debt, Fixed Income Fund Edition*, FT.COM/ALPHAVILLE (Sept. 9, 2009), <http://ftalphaville.ft.com/blog/2009/09/09/70851/adventures-in-hybrid-debt-fixed-income-fund-edition/>.

efficacy of contingent capital in a crisis.⁷⁶⁵ Nonetheless, some recent issuances do offer hope of contingent convertible structures that (1) satisfy the needs of the issuing bank (e.g., qualifying as regulatory capital) and (2) generate substantial investor demand. Such issuances include the 2011 offerings from Lloyds, Rabobank,⁷⁶⁶ and Credit Suisse.⁷⁶⁷ Despite this, credit analysts are cautious about the level of real demand for contingent capital instruments, especially from institutional bond funds, which are important holders of Tier 2 subordinated bank debt.⁷⁶⁸ As mentioned above, expected demand is also a function of the ultimate ratings treatment applied to contingent capital instruments by ratings agencies, as well as how much credit to assign them as regulatory capital, both questions that are yet to be resolved.

Marketing of contingent capital across a wide investor universe will struggle to proceed in earnest until issuers develop standards to govern the circumstances in which the instruments become convertible. Three templates exist. One model assigns this decision to the discretion of the issuer's primary regulator. While the convertibility of the capital instruments are subject to contract, the conditions triggering the convertibility are determined by regulators upon a determination that the issuer's financial condition is unsatisfactory, for example due to a negative stress-test result or ahead of an imminent public equity injection.⁷⁶⁹ The regulatory approach is favored by the Basel Committee. The second model bases conversion on the adequacy of the issuer's capital ratios.⁷⁷⁰ The Association for Financial Markets in Europe (AFME) favors this model and the Lloyds and Rabobank securities are patterned on it.⁷⁷¹ The third model employs market-based variables to determine when to convert,⁷⁷² such as an issuer's share price, credit spreads, or, in a variation proposed by Hart and Zingales (2010), the CDS pricing on an issuer's

⁷⁶⁵ Nixon, *supra* note 762.

⁷⁶⁶ See Robert Lindsay, *Lloyds Wins Strong Demand for £8.5bn Bond Issue*, TIMES ONLINE, Nov. 23, 2009, http://www.timesonline.co.uk/tol/business/industry_sectors/banking_and_finance/article6928022.ece; Coffee, *supra* note 731, at 36 n.73.

⁷⁶⁷ Corcuera et al., *supra* note 732.

⁷⁶⁸ Jane Merriman, *Analysis—Big Banks Winners from New Contingent Capital Move*, REUTERS, Aug. 27, 2010, <http://www.reuters.com/article/idUKTRE67Q2RW20100827>.

⁷⁶⁹ BASEL COMM., LOSS ABSORBENCY, *supra* note 754, at 5-6.

⁷⁷⁰ *Id.* at 12.

⁷⁷¹ AFME, *supra* note 728, at 8.

⁷⁷² *Id.* at 9; BASEL COMM., LOSS ABSORBENCY, *supra* note 754, at 12.

long-term subordinated debt.⁷⁷³ To ensure that a market-based trigger is activated only during a genuine market-wide downturn, some have suggested pairing any of these market measures of an issuer's individual riskiness with a secondary variable measuring overall market risk, for instance the level of an index of financial firms. For example, McDonald (2010) and Pennacchi (2010) suggest a "dual price trigger" tied to (1) the issuer's share price and (2) an index of financial firms. Using an index-based component theoretically would help to ensure that conversion of contingent capital instruments occurs only during a financial crisis, when all firms are faring poorly for systemic reasons, while restricting convertibility and leaving scope for resolutions through normal bankruptcy channels during periods of market normalcy.⁷⁷⁴

The market trigger model, unlike the regulatory- or capital-based alternatives, is independent of regulatory discretion and observable in real time. Critics of a market trigger worry that it will expose conversion to arbitrary market volatility and conscious manipulation and minimize the maneuvering power of regulators who may at times be justified in overriding the market's judgment.⁷⁷⁵ But restricting discretion on the part of regulators may be desirable in the novel circumstances contemplated by conversion, since this is exactly when investors are most in need of objective information about credit risk and least capable of accommodating uncertainty linked to regulatory judgments. Since a market trigger defines the parameters governing conversion in clear contractual terms at the time of issuance, it can help buyers optimize pricing of contingent capital, addressing concerns about market appetite reported by Rabobank. Risk of manipulation may be overstated too. It is doubtful if even wide-scale manipulation by "speculators" or short-sellers could exercise enough influence on securities prices to trigger a conversion event designed only to respond to a systemic crisis. This risk could

⁷⁷³ Oliver Hart & Luigi Zingales, *Curbing Risk on Wall Street*, NAT'L AFF., Spring 2010, at 20, 26, <http://www.nationalaffairs.com/publications/detail/curbing-risk-on-wall-street> (outlining a framework for protecting systemically relevant debt through the use of a cushion of loss-absorbing subordinated debt). Hart and Zingales propose using the CDS pricing on this subordinated debt as a proxy for measuring the market's estimate of the risk of the issuer and a signal to regulators for when intervention is necessary. See also Barbara A. Rehm, *A Shot at Redemption for Credit-Default Swaps*, AM. BANKER (Jan. 20, 2011); Chiamonte & Casu, *supra* note 661, at 29 (concluding that CDS spreads provide good evidence of bank riskiness based on their strong relationship with bank balance sheet ratios through the financial crisis of 2007–2009).

⁷⁷⁴ Robert L. McDonald, *Contingent Capital with a Dual Price Trigger* (Feb. 2010), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1553430; George Pennacchi, *A Structural Model of Contingent Bank Capital* 12 (Fed. Reserve Bank of Cleveland, Working Paper No. 10-04, Apr. 2010), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1595080.

⁷⁷⁵ AFME, *supra* note 728, at 9.

easily be addressed, in any case, by adding an index-based conversion provision of the type described above, which would require a downturn in the performance of *all* of the financial institutions in the financial system before mandating conversion of any individual issuer's contingent capital.

Pairing contingent capital instruments to an index-based trigger would also help to mitigate concerns that managers and shareholders might view their risk-taking as subsidized in part by convertible bondholders and develop perverse incentives to trigger conversion.⁷⁷⁶ For example, for an issuer that incurred large losses in the ordinary course and became balance sheet insolvent under otherwise normal market conditions, the strict priority rules applied in a standard resolution would wipe out equity holders (potentially including management) with no possibility of a post-reorganization recovery. Compared to that outcome, these stakeholders might actually prefer for contingent capital securities layered above them to convert to equity. Old equity holders would suffer serious dilution, but thereafter would remain “in the game” in case their institution survived and its valuation rebounded.

On the other hand, reliance on index-based triggering might increase overall correlation risk among contingent capital issuers during a market-wide crisis. If a conversion event at one financial institution caused the securities prices of peer institutions to decline, for example because investors become fearful of a more generalized crisis, this could inadvertently prompt conversion of contingent capital securities issued by other institutions. By linking the behavior of individual convertible instruments to the performance of financial institutions *other* than the issuer itself, an index-trigger might introduce an additional source of correlation and interconnectedness to the marketplace, increasing systemic risk as a result.⁷⁷⁷ Additionally, to serve their purpose in a crisis, both the index-based and the single-issuer market triggers, either separately or in conjunction, must incorporate a type of market variable that is impervious to the effects of noise in the marketplace. If CDS prices, credit spreads, or share prices prove to be too

⁷⁷⁶ See BASEL COMM., LOSS ABSORBENCY, *supra* note 754, at 9.

⁷⁷⁷ See generally Nicholas Beale et al., *Individual Versus Systemic Risk and the Regulator's Dilemma*, PROC. NAT'L ACAD. SCI. U.S.A. (2011), www.pnas.org/cgi/doi/10.1073/pnas.1105882108 (“[T]he regulator faces a dilemma: should she allow banks to maximize individual stability, or should she require some specified degree of differentiation for the sake of greater system stability? In banking, as in many other settings, choices that may be optimal for the individual actors may be costly for the system as a whole, creating excessive systemic fragility.”).

easily distorted during a crisis for any reason, then use of a market trigger will have to be reevaluated. Indeed, a September 2011 study by the Federal Reserve Bank of New York found that “trade frequency in single-name reference entities was relatively low.”⁷⁷⁸ This thin trading may suggest that CDS prices do not function as a high-quality proxy for market participants’ perception of a reference entity’s likelihood of default, and therefore might not provide a reliable trigger for conversion.

Designing contingent capital instruments to overcome these practical considerations may improve the existing framework for internalizing the costs of financial distress and might lessen the probability of failure by adding to the amount of capital available to financial institutions to draw on. But it will not be enough to correct the financial system’s vulnerability to liability interconnectedness and contagion: since these instruments cannot guarantee short-term creditors’ immunity to loss, short-term creditors always remain potentially exposed. In addition to not deterring a contagious run, contingent capital appears to be unable to halt one that is underway, since converting debt to equity does not provide incremental *liquidity* to the institution in crisis. Under ordinary circumstances, writing off excess indebtedness might create capacity to raise new funds, but only if the issuer persuades the market that it can continue operating as a going concern, which may be impossible during a crisis. Indeed, a conversion event might well intensify pressures on an institution. Existing creditors and new potential investors might instead interpret the signal transmitted by the conversion of contingent capital into equity as a sign of fatal distress.

Since contingent capital does not satisfy the systemic demand for liquidity created during a run, it can never be relied on to rescue financial institutions affected by contagion. Those proponents of contingent capital instruments who appreciate this limitation acknowledge the necessity of interim liquidity facilities, organized privately or in all likelihood by a public lender-of-last-resort to steward issuers through a period of systemic crisis.⁷⁷⁹ But this admission concedes too much, since in this case the lender-of-last-resort, not contingent capital bondholders, will be primarily accountable for underwriting the large public costs of dissipating

⁷⁷⁸ Kathryn Chen et al., *An Analysis of CDS Transactions: Implications for Public Reporting* 3 (Fed. Reserve Bank of N.Y., Staff Report No. 517, Sept. 2011), http://newyorkfed.org/research/staff_reports/sr517.pdf.

⁷⁷⁹ AFME, *supra* note 728, at 6.

any contagion effects. Evaluated in terms of its effectiveness at preventing the spread of financial contagion, contingent capital might render the financial system marginally safer by improving the quantity and flexibility of its total capitalization. It represents an improvement to using normal capital instruments and normal resolution channels, but it is not a complete solution to the problem of contagion.

ii. Creditor Bail-Ins

(1) Fundamentals of a Bail-in

Creditor “bail-in” transforms the basic loss absorbing functionality of contingent capital instruments into a more general and non-contractual architecture for restructuring a financial institution’s liabilities without going through an extended resolution process. Bail-in refers to a set of related techniques that aim at forcing the creditors of a financial institution that is deemed by regulators to be in danger of failing to absorb the losses that it has incurred by swapping certain of their liability claims for new equity issued for the purpose of recapitalizing its balance sheet. Bail-in uses debt-to-equity conversion to increase a troubled financial institution’s total pool of available capital and to reduce its leverage in a period of stress.⁷⁸⁰ Unlike contingent capital, bail-in is a stand-alone strategy for resolving distressed or failed institutions.⁷⁸¹ It is a systematic resolution procedure, not a class of capital instruments, which is intended to automate the conversion and write-down of a designated portion of a financial institution’s debt capital structure in response to a preceding regulatory determination or trigger event.⁷⁸² Conversion through a process of bail-in is not governed by contract and, as such, can embrace any or all parts of an institution’s debt, including instruments that may not have been specified as convertible at the time of issuance. This is sharply different from contingent capital instruments, which are designated in advance to convert only under a defined set of contractual conditions.

⁷⁸⁰ See Chris Bates & Simon Gleeson, *Legal Aspects of Bank Bail-Ins* 5-6 (May 2011), http://www.cliffordchance.com/publicationviews/publications/2011/05/legal_aspects_ofbankbail-ins.html (comparing and distinguishing creditor bail-in with contingent capital).

⁷⁸¹ AFME, *supra* note 728, at 5, 11; see also Bates & Gleeson, *supra* note 780, at 5-6.

⁷⁸² AFME, *supra* note 728, at 5 (distinguishing contingent capital from creditor bail-in, noting that the former is “a recovery (rather than resolution) tool that serves to replenish a firm’s capital by converting a [specific class of] debt instrument to equity... well before a firm becomes distressed”); see also Wilson Ervin, Presentation at Harvard Europe-U.S. Symposium, Cross Border Resolution Panel, at 11 (Mar. 2011), <http://www.law.harvard.edu/programs/about/pifs/symposia/europe/2011-europe/panelist-presentations/ervin.pdf>.

Under most approaches envisioned by its sponsors, to institute a creditor bail-in regulators simply would require that designated liabilities (those that regulators have selected, whether or not they incorporate a preexisting contractual conversion feature) undergo a form of mandatory write-off or convert to equity.⁷⁸³ One important consequence of this difference is that contingent capital is naturally limited in the amount of support it can provide to an ailing firm to the value of contingent capital instruments that are actually issued and outstanding. By contrast, creditor bail-in would potentially provide the same firm access to a much larger implied capital cushion, theoretically equal to the firm's entire financial indebtedness. This would enable bail-in to serve the role of a comprehensive resolution system during a crisis, rather than just supplying a novel form of supplementary capital. Recent proposals envision a bail-in regime that incorporates both conversion of contingent capital as well as creditor bail-in.⁷⁸⁴

(2) Shortcomings of Bail-in

The major shortcoming common to all forms of creditor bail-in, aside from the very wide ranging financial and legal uncertainty associated with implementing it, is the significant destabilizing effect it could exert on short-term creditors of financial institutions that are targeted by regulators for recapitalization, as well as of *any other* institutions that are not explicitly targeted by regulators but that creditors *fear* could become targets in the future.⁷⁸⁵ A creditor bail-in regime that is sweeping enough to encompass all classes of financial debt would impose the threat of loss absorption on short-term creditors of institutions both known to be on the verge of failure and thus imminently subject to bail-in and also currently "safe" institutions that *would* be resolved through bail-in during a severe crisis. This threat is likely to provoke those who fear a possible future bail-in to exit in anticipation, draining liquidity from the financial system and potentially sparking a contagious event. Indeed, the FDIC has opposed the use of creditor bail-in largely because of contagion concerns. According to then FDIC Chairman Sheila Bair,

⁷⁸³ AFME, *supra* note 728, at 12-14; Thomas F. Huertas, Vice Chairman, Comm. of Eur. Banking Supervisor and Director, Banking Sector, Fin. Servs. Auth. (UK), *Routes to Resolution: Bridge Bank and Bail-ins* 4-9 (draft for discussion) (describing two related methods of bail-in, by write-down or conversion).

⁷⁸⁴ Jianping Zhou et al., *From Bail-out to Bail-in: Mandatory Debt Restructuring of Systemic Financial Institutions* (IMF Staff Discussion Note, April 24, 2012), www.imf.org/external/pubs/ft/sdn/2012/sdn1203.pdf [hereinafter IMF Staff Note].

⁷⁸⁵ See Huw Jones, *Regulators Sound Caution on Bank Bail-in Proposal*, REUTERS, Oct. 18, 2010, <http://www.reuters.com/article/idUSTRE69H28X20101018> (reporting concern that creditor bail-in might "trigger a shock in the markets that might hamper the ability of other banks to raise capital").

“conversion to equity in a stressed situation could trigger a run on the institution, downstream losses to holders of the debt, and potentially feed a crisis.”⁷⁸⁶ Furthermore, to the extent that other financial institutions are holders of the bailed-in debt, a preliminary assessment of the direct effects on these financial firms as bailed-in creditors of the troubled institution should be made.⁷⁸⁷

Since the process of bail-in is designed to bypass ordinary bankruptcy channels (including chapters 7 and 11 of the U.S. Bankruptcy Code and the various forms of FDIC resolution) the automatic stay normally instituted against withdrawals by creditors in bankruptcy might not be available to prevent a mass exit,⁷⁸⁸ though this shortcoming could be addressed in principle by extending the application of such a stay to cover debts subject to the bail-in. For example, § 362 of the U.S. Bankruptcy Code automatically prohibits the creditors of an entity entering bankruptcy from enforcing financial claims against the debtor (apart from so-called “qualified financial contracts” (QFCs) that they are entitled to terminate).⁷⁸⁹ In FDIC resolutions, the Federal Deposit Insurance Act (FDIA) provides a non-automatic stay of litigation that must be requested by the FDIC in its capacity as conservator or receiver for between 45 and 90 days.⁷⁹⁰ Even if such a stay could be adapted to bail-in, however, it would not deter runs by anxious short-term creditors on institutions that had not yet become subject to bail-in (and to which no stay applied), but which, they feared, might become so in the future.

Anticipatory runs by short-term creditors on institutions that have not yet, but could soon be, bailed-in thus present a major problem for the implementation of a bail-in regime. The main alternative—exempting short-term creditors from bail-in, for example by announcing an express carve-out of short-term debt or confining its reach to a financial institution’s regulatory capital instruments only—could restrict its effectiveness in situations where severe losses overwhelm an

⁷⁸⁶ *The Changing Role of the FDIC: Hearing Before the H. Comm. on Oversight & Gov’t Reform, Subcomm. on TARP, Financial Services, and Bailouts of Public and Private Programs*, 112th Cong. (June 22, 2011) (statement of Sheila Bair, chairman, Fed. Deposit Ins. Corp.), <http://www.fdic.gov/news/news/speeches/chairman/spjun2211.html>.

⁷⁸⁷ Zhou et al., *supra* note 784, at 22.

⁷⁸⁸ 11 U.S.C. § 362 (2006).

⁷⁸⁹ See 11 U.S.C. § 362(a)(4)-(7) (2006) (staying, *inter alia*, creation and enforcement of liens against debtor, collections of claims against debtor, and “setoff[s] of any debt owing to debtor” against other claims); *id.* §§ 555, 556, 559, and 560 (exempting securities and commodities contracts and swap and repurchase agreements from the coverage of Section 362).

⁷⁹⁰ 12 U.S.C. § 1821(d)(12).

institution's capital buffers. It is an empirical question as to how significant this overwhelming problem could be. But if short-term creditors anticipate that a shortfall of loss absorbing capital will prevent a successful recapitalization of the institution, they might decide that bail-in is bound to fail and run anyway. Explicitly carving short-term debt out from the coverage of a bail-in regime might also promote a shift of institutional funding from unprotected longer-term capital instruments into shorter-maturity investments, increasing overall systemic dependency on short-term debt. This would increase the overall risk of contagion in the financial system rather than contain it.

(3) Implementation of Bail-in

Policymakers vigorously debate the methods of implementation of creditor bail-in, although most of the varying forms proposed share the same underlying properties.⁷⁹¹ The bail-in procedure is generally patterned on a prepackaged out-of-court restructuring that is intended to enable a struggling bank to recapitalize swiftly and free from the institutional value destruction or market disruption typical in a judicial or administrative reorganization.⁷⁹² AFME, for example, has envisioned a bail-in process that proceeds in three stages. In the first stage, non-performing balance sheet assets are identified by regulators and written down to levels reflective of current valuations, and these losses are translated to the income statement. Though some argue that this process will contribute to an increase in the quality of market information by enhancing the credibility of financial disclosures, perhaps improving the market valuation of the distressed firm,⁷⁹³ these benefits are uncertain, and depend on the effectiveness of regulators at determining appropriate valuations to assign non-performing assets in the middle of a crisis when markets are distressed. In the second stage, the amount of capital required to (1) replace capital wiped out in the write-off of bad assets in stage one and (2) position the firm to survive future volatility is

⁷⁹¹ See, e.g., Thomas F. Huertas, Vice Chairman, Committee of European Banking Supervisors and Director, Banking Sector, Financial Services Auth., *The Road to Better Resolution: From Bail-Out to Bail-In* 12 (Working Paper, Sept. 2010).

⁷⁹² See, e.g., *id.* at 12-15 (comparing bail-ins to a "pre-pack recapitalisation"); Adam Bradbery, *Bondholders Face a Push to Impose Bank Bail-Ins*, WALL ST. J., Aug. 25, 2010, <http://online.wsj.com/article/SB10001424052748703447004575449440499780022.html>.

⁷⁹³ Wilson Ervin, *Are We Ready For The Next Crisis?*, Mar. 19, 2010, at 9; AFME, *supra* note 728, at 21.

calculated.⁷⁹⁴ Again, this operation is likely to entail considerable regulatory guesswork and speculation about future market developments. Unless regulators who are overseeing a bail-in can make reasonable determinations of the value of assets, it will be difficult and probably impossible, particularly within a short time frame, to calculate the amount of new capital that is required to support the realization of losses. Assuming that the amount of capital the firm needs can be calculated, in the third stage the conversion ratio for designated debt instruments is computed and applied in reverse priority upward through the firm's debt capital structure from the least to most senior instruments until all pro forma capital requirements have been met.⁷⁹⁵

Some commentators urge that this procedure must be executed as swiftly as feasible (e.g., over the weekend) to prevent the erosion of the financial institution's going-concern value due to the loss of customers, counterparties, and short-term creditors while regulators are conducting the bail-in. It is doubtful if regulators will be able to conduct a bail-in in that period, given the serious obstacles to asset identification and valuation noted above. On the other hand, the necessity of conducting a bail-in essentially overnight may be exaggerated, since in principle regulators could just impose a temporary stay on withdrawals of funding by creditors upon initiating the bail-in, then proceed at a more rational pace to recapitalize the institution—the practice in ordinary bankruptcy. This could require a change in existing law. The effectiveness of the stay could be bolstered through the use of payment preference rules, which in formal bankruptcy authorize the administrator to void payments to creditors within 90 days of filing or which violate the stay.⁷⁹⁶ If the FDIC or a similar entity were responsible for conducting bail-in, it could also provide temporary bridge financing to support the institution while regulators completed the transaction. The Dodd-Frank Act has complicated this possibility, at least for deposit-taking banks that require bail-in. Dodd-Frank effectively eliminates open bank

⁷⁹⁴ AFME, *supra* note 728, at 13. Huertas urges that this capital must be sufficient to replace the minimum mandatory tangible common equity of the institution undergoing bail-in, and ideally in excess of this amount, “on the order of 10% of [risk-weighted assets].” Huertas, *The Road to Better Resolution: From Bail-Out to Bail-In*, *supra* note 791, at 13.

⁷⁹⁵ AFME, *supra* note 728, at 13; Huertas, *Routes to Resolution: Bridge Bank and Bail-ins*, *supra* note 783, at 4-8; *see also* Huertas, *The Road to Better Resolution: From Bail-Out to Bail-In*, *supra* note 791, at 13. Sources of “back-up capital” would include “all forms of capital that would be eligible to be bailed in upon a finding that the bank no longer met threshold conditions [including] all non-equity forms of capital (non-core Tier 1 capital such as preferred stock, Tier 2 capital such as subordinated debt, etc.). It might also include certain forms of senior debt.” Huertas, *The Road to Better Resolution: From Bail-Out to Bail-In*, *supra* note 791, at 13.

⁷⁹⁶ *See, e.g.*, 11 U.S.C. §§ 547, 550 (2006).

assistance, which had allowed the FDIC to provide loans, purchase assets, assume liabilities, and provide cash contributions to prevent an insured bank from failing.⁷⁹⁷

Moreover, as noted earlier, staying creditors of one institution undergoing bail-in during a panic may induce short-term creditors of other institutions fearful of a stay being imposed to run in anticipation. This could worsen instability in the financial system at the exact time that regulators are trying to contain it. Further, for several reasons outlined below, financial institutions with operations in many different jurisdictions subject to incompatible insolvency laws are poor candidates for resolution through bail-in, so creditors are unlikely to believe the operation will be successful. Therefore, regulators may be unable to halt a run by creditors located in many different jurisdictions.

(4) Creditor Preference

The practical effect of carrying out a creditor bail-in, assuming these obstacles could be overcome, resonates with the economic purpose of standard resolution procedures including chapters 7 and 11 of the U.S. Bankruptcy Code or administrative resolution by the FDIC: the expenses of financial distress are imposed on creditors of the troubled firm while the firm's balance sheet is recapitalized.⁷⁹⁸ Unlike what occurs under these statutory regimes, however, in bail-in the losses imposed on creditors are absorbed automatically at the direction of regulators, avoiding the need to place the firm into a prolonged period of conservatorship or receivership or jeopardize its ability to continue operating as a going concern.⁷⁹⁹ Some argue that creditors and shareholders will also prefer bail-in over total liquidation of their claims, since they may benefit from appreciation in the market value of the recapitalized equity they receive,⁸⁰⁰ but the "option value" supplied by bail-in is far from certain, since creditors might recover more from outright liquidation, if the viability of the institution will be further eroded after the bail-in. Creditor bail-in may also reserve room for preserving contracts with financial counterparties, including derivatives, that a firm ordinarily would be entitled to terminate in the context of formal

⁷⁹⁷ *Id.* § 1106(b).

⁷⁹⁸ AFME, *supra* note 728, at 11.

⁷⁹⁹ *Id.*

⁸⁰⁰ Bradbery, *supra* note 792; Paul Calello & Wilson Ervin, *From Bail-Out to Bail-In*, *ECONOMIST*, Jan. 30, 2010 (arguing that creditors and shareholders will favor bail-ins "because the losses from a bail-in resolution are so much smaller than the losses at risk in a liquidation").

insolvency proceedings (as compared with FDIC proceedings).⁸⁰¹ This assumes the appropriate structuring of the bail-in transaction to circumvent events of default defined by the ISDA Master Agreement.⁸⁰² This may not be feasible in practice, and will likely require statutorily compelled modification of the Agreement forgoing termination rights in the event of a bail-in that will make derivative contracts riskier investments for counterparties. Bringing derivative contracts under the coverage of a bail-in regime would thus enhance their riskiness, and might prompt counterparties to demand more collateral or to select non-bailable institutions for derivatives instead.

(5) Bailable Instruments

Common to all forms of creditor bail-in, including the AFME's proposal, is the question of which classes of debt instruments are eligible for impairment or conversion. Absent a special exemption from normal priority rules, applying debt-to-equity conversion across the entirety of a financial institution's capital structure will expose short-term unsecured debt holders to the risk of impairment, encouraging them to exit preemptively from an institution that is perceived to be in distress, considerably increasing the risk of a run. If a bail-in imposed on short-term creditors of one financial institution prompts investors in the same economic position at other institutions in the financial system to run too, the ultimate results could be contagious. Shielding short-term debt holders (in particular, uninsured deposits including foreign deposits, non-deposit short-term debt, plus all the other systemically important liabilities that are likely to exit instead of accepting impairment) from the imposition of losses will, however, override ordinary rules of contractual priority controlling inter-creditor relationships outside of bankruptcy, altering the pricing of longer-term bailable instruments that beforehand may have ranked equivalently with (or senior to) shorter-term debt in order of recovery but now will in effect have been demoted. At the least, the power of regulators conducting bail-in to unsettle existing inter-creditor contracts for the purpose of favoring systemically relevant debt is likely to raise the cost of disfavored bailable instruments proportionately. Further, short-term creditors that harbor doubt about whether exemptions will actually be given or the strength of the legal footing for a regulatory

⁸⁰¹ AFME, *supra* note 728, at 14; *see also* 11 U.S.C. §§ 555, 556, 559, and 560 (exempting various QFCs from Section 362 in bankruptcy); 12 U.S.C. § 1821(e)(8) (covering treatment of QFCs in FDIC-administered resolution).

⁸⁰² AFME, *supra* note 728, at 14.

carve-out will rationally prefer to withdraw from a distressed institution rather than remain invested during a bail-in, taking their chances in court. The impulse to run could be ameliorated through use of a stay, though again this is dependent on whether regulators across different jurisdictions can be successful in coordinating to impose one. Failure to coordinate could result in anticipatory runs.

Most of the current bail-in proposals, such as approaches urged by the AFME or Huertas (2010), understand the contagion problem and would thus only bail-in unsecured capital instruments including preferred stock, subordinated debt, hybrid capital, and senior unsecured debt but *not* deposits and other “protected” funding.⁸⁰³ A recent proposal by the IIF envisions more limited bail-in that would be ordinarily confined to an institution’s subordinated debt only, with unsecured senior debt bailed-in “only in...special circumstances [where] necessary as a last-resort alternative to winding-down or liquidation.”⁸⁰⁴ Finally, an IMF staff note recommends excluding insured/guaranteed deposits, secured debt (including covered bonds), and repurchase agreements from restructuring. Furthermore, “with respect to senior unsecured debt, it may be appropriate to carve out some types of senior unsecured debt from the restructuring process, including inter-bank deposits, payments, clearing and securities settlement system obligations and, arguably, also some trade-finance obligations.”⁸⁰⁵

Special attention must be devoted to the status of foreign deposits in bail-in, which do not benefit from the same protections shielding domestic deposits in the United States. Rather, since the enactment of the national depositor preference in 1993, foreign depositors have ranked *pari passu* with general creditors in FDIC resolution, behind domestic depositors in order of recovery.⁸⁰⁶ Unless foreign depositors receive coequal protection against impairment in the event of a bail-in, they are likely to exit domestic institutions that become or might become

⁸⁰³ *Id.*; Huertas, *Routes to Resolution: Bridge Bank and Bail-ins*, *supra* note 783, at 5-6.

⁸⁰⁴ INST. OF INT’L FIN., ADDRESSING PRIORITY ISSUES IN CROSS-BORDER RESOLUTION, at ii (2011).

⁸⁰⁵ Zhou et al., *supra* note 784, at 22.

⁸⁰⁶ 12 U.S.C. §§ 1813(l), 1821(d)(11) [hereinafter Federal Deposit Insurance Act]; Omnibus Budget Reconciliation Act of 1993, Pub. Law No. 103-66, § 3001(a) (1993) [hereinafter National Depositor Preference Amendment].

distressed.⁸⁰⁷ Equalizing the treatment of domestic and foreign depositors in the context of a bail-in is especially critical for larger financial institutions with multinational scale, such as Citigroup, which reported \$484 billion in deposits outside of the United States at the end of 2008, representing 62.5% of its total deposit base.⁸⁰⁸ The Basel Committee proposal, which limits bail-in conversion to non-common Tier 1 and Tier 2 capital instruments only, would be likely to preserve foreign deposits intact.⁸⁰⁹ Under this formulation, short-term debt presumably will be excluded from conversion, since it is not a capital instrument. This will reduce the danger of setting off a run or spreading contagion. Limiting the selection of bailable instruments to Tier 1 and Tier 2 capital only, however, could restrict the total amount of capital potentially available to absorb losses, narrowing the usefulness of bail-ins to situations in which institutional losses are no greater than total existing capital. During an exceptionally severe crisis, the Basel approach risks reserving too few convertible resources for regulators to tap without provoking a run. Short-term investors who suspect that their issuer's long-term debt and common equity are insufficient to facilitate the recapitalization will expect to be impaired too despite ex ante assurances of a carve-out, and may run anyway. This concern is even more acute in the case of the IIF proposal, which ordinarily reserves only subordinated debt, but not senior debt, for bail-in conversion, and thus increases the chance that a severely impaired firm will be unable to marshal the financial resources necessary to support a successful bail-in. Although the IIF proposal does permit bail-in of senior indebtedness in extraordinary circumstances, it would require a separate decision by regulators.⁸¹⁰ If short-term creditors had any doubt that this decision would be timely and forthcoming, they might panic and run.

⁸⁰⁷ See, e.g., James A. Marino & Rosalind L. Bennett, *The Consequences of National Depositor Preference*, FDIC BANKING REVIEW, Oct. 1999, at 36-37, http://www.fdic.gov/bank/analytical/banking/1999oct/2_v12n2.pdf (The authors voice concern that the "national depositor preference... will very probably alter the behavior of market participants in meaningful ways. Uninsured depositors and unsecured creditors will probably be more skittish. They will protect their interests more actively and thus precipitate a liquidity failure much more rapidly than has been the case in the past... because earlier closures have a greater potential for leaving foreign depositors and other creditors unprotected, to the benefit of the FDIC.").

⁸⁰⁸ Citigroup, Financial Information, Quarterly Financial Data Supplement (Dec. 31, 2008), <http://www.citigroup.com/citi/fin/qer.htm> (reporting \$774 billion total deposits as of December 31, 2008, comprising \$290 billion, or 37.5%, in interest- and non-interest bearing deposits in U.S. offices and \$484 billion, or 62.5%, in offices outside the United States).

⁸⁰⁹ BASEL COMM., LOSS ABSORBENCY, *supra* note 754, at 4.

Figure 2.8A: Illustrative Bail-in of Citigroup Balance Sheet as of December 31, 2008⁸¹¹
\$ millions

ASSETS	12/31/08	REALIZED IMPAIRMENT OF:	
	Actual	20.0%	50.0%
Cash, deposits, fed funds, and brokerage receivables ^(a)	\$427,995	\$427,995	\$427,995
Trading account assets	380,043	304,034	190,022
Investments, available for sale and held to maturity)	253,393	202,714	126,697
Loans, net of allowances	664,915	531,932	332,458
Other assets ^(b)	218,917	218,917	218,917
TOTAL ASSETS	\$1,945,263	\$1,685,593	\$1,296,088
Total losses to be absorbed	--	(\$259,670)	(\$649,176)
LIABILITIES AND EQUITY			
Deposits	\$774,185	Protected/ineligible funding source that cannot be impaired through bail-in.	
Repurchase agreements	205,293		
Brokerage payables	70,916		
Trading account liabilities	167,536		
Short-term borrowings	126,691		
Other liabilities ^(c)	90,275		
Subtotal - Protected or ineligible liabilities	1,434,896		
Long-term debt	359,303	Available to absorb losses	
Other secured debt	290		
Shareholders' equity	150,774		
TOTAL LIABILITIES AND EQUITY	\$1,945,263		
Tier 1 cap. / Implied Tier 1 for constant ratio	\$118,758	\$102,905	\$79,126
Tier 1 leverage ratio (Tier 1 capital / total assets)	6.1%	6.1%	6.1%
ILLUSTRATIVE LOSS ABSORPTION SCHEDULE			
Total losses to be absorbed		\$259,670	\$649,176
Less: Losses absorbed by Tier 1 capital		(118,758)	(118,758)
Residual losses to be absorbed by converting long-term debt		140,912	530,418
Add: Conversion of long-term debt to maintain Tier 1 leverage ratio		102,905	79,126
Total long-term debt required for bail-in		243,817	609,543
Actual long-term debt held on balance sheet		359,303	359,303
Implied bail-in funding surplus (deficit/required public support)		\$115,486	(\$250,240)

(a) Includes fed funds sold and securities borrowed/purchased under resale agreements.

(b) Includes goodwill, intangible assets, mortgage servicing rights, and other.

(c) Includes credit loss allowances for letters of credit.

These problems can be illustrated by looking at the December 31, 2008 consolidated balance sheet of Citigroup (*see* Figure 2.8A). It suggests that the firm possessed enough senior and subordinated long-term debt to support losses of 20% to its trading, investment, and loan portfolios through bail-in, without impairing guaranteed, short-term, and otherwise ineligible instruments. Losses greater than approximately 30% of the carrying value of these assets, however, would have exhausted the amount of long-term debt eligible for bail-in, requiring public support to fully restore the pre-bail-in leverage ratio without converting shorter-term instruments.

⁸¹¹ See Citigroup, Financial Information, Quarterly Financial Data Supplement, *supra* note 808.

Figure 2.8B: Illustrative Bail-in of Citigroup under IIF Proposal with Subordinated Debt Only⁸¹²
\$ millions

Citigroup long-term debt maturities as of 12/31/2008:

<u>Senior debt</u>		
Senior notes - Parent	\$138,005	} Ineligible initially for creditor bail-in under IIF proposal
Senior notes - Subsidiaries	105,629	
Senior notes - Other	57,994	
Total senior debt	301,628	
<u>Subordinated/junior subordinated debt</u>		
Subordinated debt - Parent	54,276	
Subordinated debt - Subsidiaries	3,395	
Subordinated debt - Other	4	
Total subordinated debt	57,675	16.05%
Total long-term debt	\$359,303	

LOSS ABSORPTION SCHEDULE ASSUMING LOSSES OF:	20.0%	50.0%
Total losses to be absorbed	\$259,670	\$649,176
Less: Losses absorbed by Tier 1 capital	(118,758)	(118,758)
Residual losses to be absorbed by converting long-term debt	140,912	530,418
Add: Conversion of long-term debt to maintain Tier 1 leverage ratio	102,905	79,126
Total long-term debt required for bail-in	243,817	609,543
Actual <u>subordinated</u> long-term debt held on balance sheet	57,675	57,675
Implied bail-in funding surplus (deficit/required public support)	(\$186,142)	(\$551,868)

Under the IIF proposal, however, in which bail-in is confined (at least initially) to subordinated and junior subordinated debt instruments only, losses of 20% or more would exhaust bailable capital and subordinated debt, requiring public support or the conversion of senior indebtedness (via separate regulatory approval) to effectuate the bail-in. As of December 31, 2008, subordinated debt held at Citigroup’s parent and subsidiaries levels totaled no more than \$57.7 billion, or just 16% of Citi’s cumulative long-term debt maturities recorded on balance sheet (the remaining \$301.6 billion represented senior long-term instruments) (see Figure 2.8B above). A bail-in of Citigroup assuming even modest balance sheet losses would thus have overwhelmed the total amount of liability claims the IIF proposal would make available to regulators. One proposed solution is to impose minimum requirements of unsecured debt that would be available for potential bail-in.⁸¹³

⁸¹² See *id.*

⁸¹³ IMF Staff Note, *supra* note 784.

(6) Potential Obstacles to Bail-in

Even if regulators were successful at structuring creditor bail-in transactions to exempt short-term debt holders while deterring the incentive to shift funding to short-term borrowing, they would still face the same array of practical obstacles that were confronted in the analysis of contingent capital. First, the impact on investor appetite of subjecting the debt of financial institutions to the risk of automatic conversion at the discretion of regulators is unknown, but it could be significant. At the end of 2010, 10 out of 33 of the largest international banks were already refinancing themselves as if they were rated at speculative levels.⁸¹⁴ The *Financial Times* reported recently the results of a customer survey by JPMorgan showing that one quarter of senior bondholders have indicated they would refuse to purchase instruments subject to bail-in risk.⁸¹⁵ This could raise average bank borrowing costs by 0.87%.⁸¹⁶ Also unknown are the prospective ratings and capital treatment that would apply to instruments eligible for bail-in, though Moody's Investors Service has cautioned that it will consider downgrades of junior bank debt subject to bail-in.⁸¹⁷ Second, the mechanics governing conversion must be designed and articulated.⁸¹⁸ If the "trigger" controlling when bail-in takes place is a pure function of regulatory discretion (rather than premising it on capital- or market-based variables), then at the very least regulators must define prospectively under what circumstances bail-in will occur (and which liabilities will be included or exempted from its sweep). This is the subject of considerable disagreement among advocates for the solution.⁸¹⁹ More problematically, it is probably not susceptible of straightforward resolution, since no one (regulators, financial institutions, or investors) can know in advance when a financial crisis will occur, how severe it is likely to be, what actions regulators will have to take in order to contain it, or how much capital will ultimately be required to facilitate loss absorption in cases of issuers that suffer extensive balance sheet impairment. Many of the putative advantages of bail-in, for example, automating resolution, minimizing regulatory intervention, and promoting uniformity in reorganizational

⁸¹⁴ *Id.*

⁸¹⁵ Jennifer Hughes & Brooke Masters, *The Debt Net*, FIN. TIMES, Feb. 21, 2011.

⁸¹⁶ *Id.*

⁸¹⁷ Jennifer Hughes, *Junior Debt in Line for Moody's Downgrade*, FIN. TIMES, Feb. 14, 2011, <http://www.ft.com/cms/s/0/b4edd888-386e-11e0-959c-00144feabdc0.html#axzz1EnpiUy3Y>.

⁸¹⁸ AFME, *supra* note 728, at 11-13.

⁸¹⁹ *See, e.g.*, Calello & Ervin, *supra* note 800. Calello and Ervin of Credit Suisse would have applied a bail-in to enable Lehman Brothers to circumvent bankruptcy, while others would restrict use of the policy to situations in which a federal bailout was unnecessary.

outcomes, all in a non-disruptive manner,⁸²⁰ require investors to know *ex ante* which claims will bear these costs and under what circumstances, but many market participants echo doubts that certainty in this connection can be achieved.⁸²¹ Senior executives at Rabobank, since embracing contingent capital, have expressed revealing skepticism of regulators' ability to make effective determinations.⁸²² Third, bail-in may entail replacing the failed institution's old management with new management that commands the confidence of the market place following reorganization. This means that new managers may have to be found and installed before a bail-in can be completed, delaying the process. Completing a bail-in, furthermore, would involve a change of control that placed former debt holders into equity ownership of the failed institution. These debt holders may, however, be deemed disfavored candidates for ownership of banking institutions under U.S. law, for example investment funds that now are subject to severe source-of-strength and cross-collateralization requirements with respect to bank investments.

Fourth, during a severe market dislocation, if asset prices fall temporarily to severely depressed levels, regulators will face difficulty establishing accurate fair market valuations for the purposes of determining the amount of conversion required on the part of debt exposed to the bail-in.⁸²³ The most straightforward solution to this valuation problem is to require *all* eligible debt to convert to equity in its entirety, but this could excessively increase the total amount of capital cushioning the financial institution undergoing bail-in to an extent that is uneconomic and unfair. It might also needlessly inflate the cost of borrowing for issuers whose creditors fear their claims will be converted in their entirety on a bail-in signal from regulators. Although the same set of questions is implicated in the design of contingent capital instruments, the contours of the problem there are more circumscribed, since the terms governing the convertibility of contingent capital instruments are specified in contract and conversion is less likely to affect the financial value or rights of *non-convertible* creditors of the same issuer.

⁸²⁰ AFME, *supra* note 728, at 21; Ervin, *supra* note 793, at 9.

⁸²¹ Jones, *supra* note 785.

⁸²² Hughes, *supra* note 759.

⁸²³ The 2012 IMF staff note suggests that to "improve client and creditor confidence, it would be desirable to establish an expectation that a bail-in will *over-capitalize* the bank to ensure that hard-to-predict losses from impaired assets will be covered." IMF Staff Note, *supra* note 784 (emphasis added).

The fifth major practical shortcoming of creditor bail-in is jurisdictional. To encompass a meaningful portion of the international financial system, a bail-in regime will need to be coordinated with insolvency laws and resolution procedures applicable in multiple national jurisdictions so that bail-ins can take place on a cross-border basis without violating or otherwise interfering with local laws.⁸²⁴ This is crucial when large financial institutions with multinational operations are subjected to bail-ins during a crisis. These institutions—arguably the most complex in the financial system—are widely regarded as most in need of an efficient alternative to current resolution regimes. Yet today, no framework for coordinating cross-border resolution of their many subsidiaries exists. Given the major obstacles to achieving coordinated bail-in policies in the near future, the better solution is to require new debt instruments issued by financial institutions to incorporate private contract terms authorizing conversion to equity upon a trigger signal from regulators of a specified country, as the Basel Committee and others, such as Bates and Gleeson (2011), have suggested.⁸²⁵ Under this alternative, creditors would contract to apply the law of the bail-in jurisdiction in advance, so that conflicts of law and among local regulators would be minimized. In the variant of this approach outlined by Bates and Gleeson, a financial institution incorporated in a bail-in regime would be required by the law of that jurisdiction to contract *ex ante* with any creditors whose claims could potentially arise in a non-bail-in jurisdiction to submit to the effect of a bail-in if one were to occur.⁸²⁶

However appealing it may be in principle, “contracting” for cross-border bail-in presents daunting challenges in practice. Success depends, among other things, on *where* the long-term debt of large, complex financial institutions is issued and held, and at what level of the corporate structure. The paradigmatic case imagined by Bates and Gleeson contemplates one-company institutions where all subsidiaries are of a parent bank (though potentially with creditors in different jurisdictions) governed by bail-in rules applicable to all creditors. If allailable debt were indeed issued at and held at the holding company level in a single jurisdiction, it might be relatively straightforward to require the institution to contract for uniform bail-in terms from all creditors. However, most large institutions hold debt at dozens or even hundreds of local subsidiaries in multiple jurisdictions (even if originally it was issued at the holding company

⁸²⁴ Bradbery, *supra* note 792.

⁸²⁵ BASEL COMM., LOSS ABSORBENCY, *supra* note 754, at 2, 6, 10; Bates & Gleeson, *supra* note 780, at 3, 13.

⁸²⁶ Bates & Gleeson, *supra* note 780, at 13.

level but then transferred downstream to those subsidiaries). Under these conditions, the contractual solution is unlikely to work. Lehman Brothers, for example, operated 433 subsidiaries in 20 different countries prior to its failure.⁸²⁷ Many subsidiaries were subject to local regulation including capital. Local regulators responsible for managing the capital levels of local bank subsidiaries are unlikely to allow conversion of subsidiary-level debt for the purpose of restoring the consolidated capital ratio at the holding company-level in a different jurisdiction, or to uphold or even permit contract terms to require that such local debt be subject to the control of foreign regulators.

Even for regulators bailing-in a financial institution that is organizationally confined to a single jurisdiction, the challenge of coordinating the conversion of debt instruments outstanding across many different bank subsidiaries so that all of these subsidiaries, in addition to the parent holding company, are adequately (but not over-) capitalized after the bail-in, will be formidable. Contracting for bail-in of complex multinational financial institutions thus presents both a “vertical” problem (coordinating bail-in between the holding company and its bank subsidiaries) and a “horizontal” one (coordinating bail-in of debt in different jurisdictions). Furthermore, relying on contract to streamline bail-in would transform it into a form of contingent capital, sacrificing its functionality as a substitute for formal resolution procedures by requiring that the major terms controlling conversion be stipulated in advance if it were to be acceptable in multiple jurisdictions.⁸²⁸

Bail-ins would likely require legislation by Congress to provide regulators with the power to impose conversion terms on issuers and debt holders.⁸²⁹ It is crucial for the legal parameters governing creditor bail-in to be made unambiguously clear in advance so that market participants, especially short-term creditors, are confident that it can be instituted without the

⁸²⁷ George Kaufman, *Living Wills: Putting the Caboose Before the Engine and Designing a Better Engine 2* (Working Paper, 2010), <http://ssrn.com/abstract=1599787>.

⁸²⁸ As recommended by the 2012 IMF staff note, an effective bail-in regime must provide the resolution authority with the authority to restructure the balance sheet of all entities within a group, not merely the entity subject to the bail-in. IMF Staff Note, *supra* note 784.

⁸²⁹ The 2012 IMF staff note recommends that a procedure for creditor approval should not be included in the bail-in framework. Moreover, the IMF staff note recommends that judicial review should not be able to reverse the resolution but should be limited to review of the legality of the action and the awarding of damages as a remedy. IMF Staff Note, *supra* note 784.

encumbrance of litigation.⁸³⁰ Securing legal certainty and ensuring that no litigation concerning the status of bail-in arises is unrealistic and probably impossible *ex ante*. The economic and legal uncertainties that surround creditor bail-in caution against overly relying on it. In the worst case, it could *provoke* runs by short-term debt holders, increasing systemic risk instead of containing it.

(7) Downstreaming of Capital Post Bail-in

Whether holding company level debt is converted to common equity through a bail-in process or through an orderly liquidation (described below), there is a question of exactly how the bank holding company will inject this fresh capital, created through the debt conversion, into its subsidiaries. Various issues may arise depending on the specific mechanism through which the bank holding company recapitalizes its subsidiary.

The injection of capital from a bank holding company into its bank subsidiary requires a downstreaming of the capital through either a transfer of assets to the subsidiary or a reduction in liabilities of the bank subsidiary. A significant channel for this capital injection could involve the latter: a reduction in the bank subsidiary's liabilities through the bail-in (or cancellation) of debt owed by the bank subsidiary to the holding company.

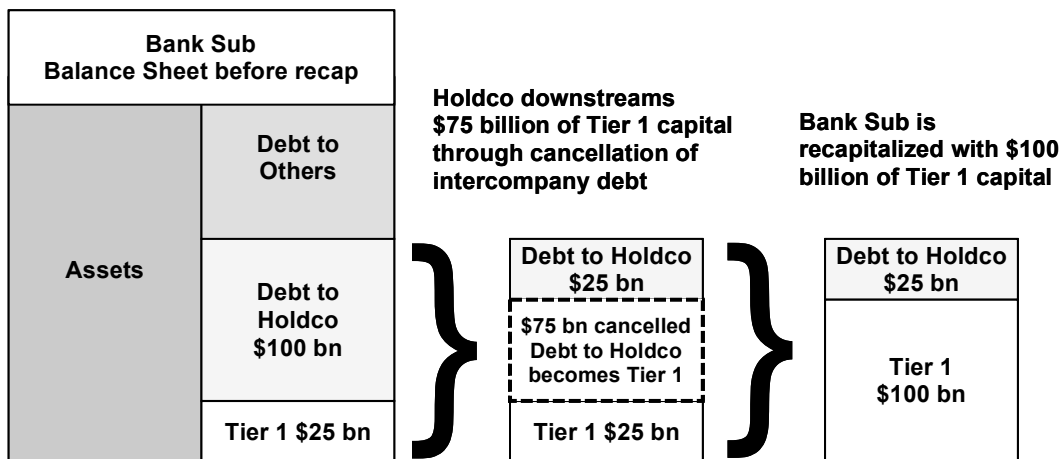
Consider the following example. Holdco is a bank holding company whose dominant holding is a large bank subsidiary, Bank Sub. Bank Sub has Tier 1 capital of \$100 billion against risk-weighted assets of \$1.6 trillion, giving it an adequate Tier 1 capital ratio of 6%. Holdco has Tier 1 capital of \$150 billion against consolidated risk-weighted assets of \$2.5 trillion, and is also adequately capitalized with a Tier 1 capital ratio of 6%. Now assume Bank Sub suffers a \$75 billion loss, causing a reduction of its Tier 1 capital to \$25 billion. Consequently, Bank Sub is in need of a massive capital injection to avoid approaching insolvency and to re-establish an adequate capital ratio. Furthermore, as a result of this loss to Bank Sub, Holdco's Tier 1 capital has also been reduced by \$75 billion to \$75 billion and Holdco is no longer adequately capitalized itself. Holdco needs to raise \$75 billion in new capital to maintain an adequate capital ratio, which can be done through the bail-in of Holdco-level debt. A bail-in of Holdco-level debt

⁸³⁰ Jones, *supra* note 785.

converts \$75 billion of debt into \$75 billion of common equity, providing the necessary capital increase for Holdco. Holdco has increased its Tier 1 capital back to \$150 billion and is adequately capitalized. However, while the bail-in of Holdco-level debt has re-established an adequate capital ratio for Holdco, Bank Sub has not yet received any new capital. Bank Sub continues to be inadequately capitalized with \$25 billion of Tier 1 capital and is in need of a \$75 billion injection from Holdco. The question is: how does Holdco downstream its newly created \$75 billion of capital to Bank Sub?

One potential channel for downstreaming the capital from Holdco to Bank Sub is through the cancellation of debt owed by Bank Sub to Holdco. As Figure 2.10 below shows, these holding company-to-subsidary loans are common arrangements in U.S. bank holding companies and could potentially serve as an adequate transmission channel for downstreaming the fresh capital that resulted from the prior bail-in of Holdco-level debt. To illustrate this channel, assume that Holdco has a loan outstanding to Bank Sub in the amount of \$100 billion. Holdco can inject \$75 billion of capital into Bank Sub by cancelling \$75 billion of the Debt-to-Holdco loans, which will increase Bank Sub’s common equity by \$75 billion. As a result, Bank Sub’s Tier 1 capital is restored to \$100 billion and it becomes adequately capitalized once again. Figure 2.9 illustrates this transmission mechanism.

Figure 2.9



At the same time, Holdco remains adequately capitalized with Tier 1 capital of \$150 billion since its consolidated balance sheet is not affected by the intercompany recapitalization.

The capital has been successfully downstreamed. So long as the necessary capital injection is less than the amount of the Holdco-to-Bank Sub loan, this transmission channel will work for downstreaming the new capital that resulted from the bail-in of Holdco-level debt. However, if Bank Sub's initial loss were greater than \$100 billion (the amount outstanding of Holdco-to-Sub loans), then the bail-in of Holdco-to-Bank Sub debt would no longer be sufficient to recapitalize Bank Sub and a further transmission mechanism would be necessary.

Figure 2.10

Top 10 U.S. Bank Holding Company Subsidiary Data ⁽¹⁾				
<i>(\$ in millions)</i>				
As of March 31, 2012	Tier 1 Capital ⁽²⁾	Tier 1 Ratio ⁽³⁾	BHC Loans to Bank Subs (aggregate) ⁽⁴⁾	BHC Loans / Sub Tier 1 Capital (Col 3/Col 1)
JP Morgan Chase & Co. (BHC)				
JPMorgan Chase Bank, N.A. (Sub)	\$100,846.0	9.58%	\$40,809.00	40.47%
Bank of America Corporation				
Bank of America, National Association	\$118,432.0	12.26%	\$45,514.50	38.43%
Citigroup Inc.				
Citibank, National Association	\$127,118.0	15.54%	\$0.00	0.00%
Wells Fargo & Company				
Wells Fargo Bank, National Association	\$93,339.0	10.13%	\$20,874.00	22.36%
Goldman, Sachs Group Inc.				
Goldman Sachs Bank USA	\$19,769.0	19.03%	\$26.00	0.13%
MetLife, Inc.				
Metlife Bank, National Association	\$1,310.7	21.29%	\$1.70	0.13%
Morgan Stanley				
Morgan Stanley Bank, N.A.	\$8,982.0	14.90%	\$4,469.00 ⁽⁵⁾	49.76%
U.S. Bancorp				
U.S. Bank National Association	\$26,071.3	9.89%	\$6,291.82	24.13%
HSBC North America Holdings Inc.				
HSBC Bank USA, National Association	\$16,119.6	13.54%	\$5,000.00	31.02%
Bank of New York Mellon Corporation				
The Bank of New York Mellon	\$12,872.0	14.75%	\$4,511.00	35.05%

1. Top 10 by total consolidated assets; Source: National Information Center as collected by the Federal Reserve System, www.ffiec.gov/nicpubweb/nicweb/Top50Form.aspx

2. Includes perpetual preferred stock, noncontrolling interests in subsidiaries and trust preferred capital debt securities (i.e. not Tier 1 Common)

3. Source for BHCs: FDIC Bank Data & Statistics Call Reports; Source for Parent Company: National Information Center / Federal Reserve, Company Filings

4. Source: National Information Center / Federal Reserve, Company Filings; includes Loans, Advances, Notes and Bonds in both Bank Operating Subsidiaries as well as Subsidiary Bank Holding Companies

5. Does not include \$14.65 billion of loans to Subsidiary Bank Holding Companies, which includes non-bank subsidiaries

Figure 2.10 shows a snapshot of the top 10 largest U.S. bank holding companies and their respective largest bank subsidiaries as of March 31, 2012. This data provides insight into the

potential for cancellation of holding company loans to subsidiaries as the primary transmission channel for downstreaming new capital. The final column shows holding company-to-subsidiary loans as a percentage of the bank subsidiary's Tier 1 capital. While more specific loan detail is necessary for a complete analysis of intercompany loan bail-ins as a viable transmission channel, this establishes an upper bound on the percentage of each bank subsidiary's Tier 1 capital that could be injected through the bail-in of loans from the holding company to the bank subsidiary. For example, JPMorgan Chase & Co. (holding company) has its largest bank subsidiary, JPMorgan Chase Bank, N.A. (bank sub) holding \$100.8 billion of Tier 1 capital. JPMorgan Chase & Co. also has \$40.8 billion of loans outstanding to its bank subsidiaries. If the entirety of those loans were to JPMorgan Chase Bank, N.A.,⁸³¹ JPMorgan Chase Bank, N.A. could suffer up to a 40.47% loss of Tier 1 capital that could be injected by the holding company through a bail-in of the \$40.8 billion of loans. In its "Public Resolution Plan" submitted to the Federal Reserve as required by Dodd-Frank, JPMorgan does indeed indicate its intention to use the cancellation of intercompany loans as the primary mechanism for recapitalizing troubled bank subsidiaries under a Title II resolution.⁸³²

However, as is evident in the Figure 2.10 data, any substantial loss that severely impacts a bank subsidiary's balance sheet (i.e., losses that approach or result in insolvency) may not be sufficiently offset by a bail-in of the intercompany loans, since not every bank is like JPMorgan in this respect. In particular, half of the banks would be unable to support losses greater than 25% of Tier 1 capital through cancellation of intercompany loans. In such cases of severe losses, the bail-in of intercompany loans is unlikely to be a sufficient means of injecting capital from the holding company into the bank subsidiary. It should be noted, however, that these intercompany loans are often structured as revolving lines of credit. The balance sheet line items in Figure 2.10

⁸³¹ JPMorgan Chase & Co. (holding company) has an aggregate amount of loans to its bank subsidiaries of \$40.809 billion. This represents loans to all of its bank subsidiaries and not necessarily entirely to JPMorgan Chase Bank, N.A. However, an assumption that the entire aggregate amount is a loan to JPMorgan Chase Bank, N.A. provides an upper bound on the potential debt available as a transmission channel for a capital injection into JPMorgan Chase Bank, N.A. from JPMorgan Chase & Co.

⁸³² See JPMorgan Chase & Co., *Resolution Plan*, July 1, 2012, <http://www.federalreserve.gov/bankinforeg/jpmorgan-chase-20120703.pdf> (stating "The preferred Title II strategy would...recapitalize these businesses by contributing some or all of such intercompany claims to the capital of such subsidiaries...").

are a snap shot of the current debt amounts outstanding on these lines of credit, which may change frequently as the subsidiary repays or further draws down on the line of credit.⁸³³

Another potential method beyond the bail-in of holding company-to-subsiidiary loans is through the liquidation of non-bank subsidiaries and the subsequent injection of cash into the bank subsidiary. However, with this approach it is unclear whether liquidation could occur in a timely enough manner in light of the time-sensitive nature of the capital injection. Expedited sales could subject the holding company to inefficient fire-sale prices, further sacrificing the efficiency of this downstreaming channel. Timeliness can be of particular concern for bank holding companies whose non-bank subsidiaries are large enough entities as to limit the pool of potential buyers to other large financial institutions. This pool would be further diminished if these financial institutions were also facing similar capital constraints on their own balance sheets.

iii. Good-Bank/Bad-Bank Resolution

“Good-bank/bad-bank” (GBBB) resolution describes a generic method for reorganizing a failed financial institution by reclassifying its balance sheet into two distinct “good” and “bad” asset classes. It is a substitute technique for standard bankruptcy that aims to maximize the resolution value of failing financial institutions. In a classic GBBB transaction, regulators focus on dividing (or “ring-fencing”) “bad” assets that are deemed to be impaired or otherwise non-performing from “good” assets, with both groups then transferred from the original institution into two new ones, respectively called the bad and good banks (alternatively, good assets might remain behind with the original institution). In contrast to more experimental resolution tools such as creditor bail-in, GBBB has been widely used in prior banking crises both in the United States and internationally. On the other hand, it is has rarely been deployed with success during a contagious run, as is illustrated by the survey of historical GBBB resolutions presented below.

Different implementations of GBBB have dealt with the division of the institution’s liabilities, the pro forma capitalization and ownership of the good and bad banks, the level of public support, and the techniques for distinguishing and valuing good and bad assets in varying

⁸³³ For example, as of Mar. 31 2011 (one year prior) Citigroup held roughly \$4 billion in loans to subsidiary banks. *See* BD. OF GOVERNORS OF THE FED. RES. SYS., BANK HOLDING COMPANY PERFORMANCE REPORT (Mar. 31, 2011).

ways. Every approach, though, is predicated on two recurring features: first, the systematic division of good and bad assets on the asset-side of the balance sheet, with the aim of improving information available to the market,⁸³⁴ minimizing uncertainty created by blending good and bad assets together, and raising investor confidence in the quality of the good bank's balance sheet;⁸³⁵ second, the transfer of any guaranteed liabilities (or non-guaranteed but still systemically relevant liabilities that must be protected to prevent a run) to the good bank on the liability-side, so that they receive the maximum protection possible from the good assets and the need for government support is minimized.⁸³⁶ Bad assets can then be liquidated over a longer time horizon, aided by specialized managers, in an orderly manner that is alleviated from the forced selling pressures created by spiking demand for liquidity during times of distress.⁸³⁷ The twin division formalizes the distinction between the two different economic functions of the good bank (loan origination) and the bad bank (asset disposition), preventing the one from interfering with the other.⁸³⁸ Some believe this limits runs and contagion since by transferring systemically important liabilities into a good bank, regulators carve them out of the restructuring process and provide reassurance that the good bank is capable of meeting its future obligations.⁸³⁹

Although GBBB transactions may make the resolution process more efficient, the general approach is not designed to stop a systemic contagious run by short-term creditors of banks

⁸³⁴ Jonathan Macey, *Are Bad Banks the Solution to a Banking Crisis?* 9-10, 32 (SNS Occasional Paper No. 82, June 1999) (describing how splitting off bad assets enhances market information about the solvency of financial institutions resolved through GBBB, ameliorating the "lemons problem facing many troubled financial institutions").

⁸³⁵ *Id.* at 29-32, 37 (noting elimination of "guilt by association" discounts through price discovery promoted by disambiguating good and bad assets); see also Max Holmes, *Good Bank, Bad Bank; Good Plan, Better Plan*, N.Y. TIMES, Jan. 31, 2009, <http://www.nytimes.com/2009/02/01/opinion/01holmes.html> (noting benefit of increased new lending activity including interbank loans); Anthony M. Santomero & Paul Hoffman, *Problem Bank Resolution: Evaluating the Options* 14 (Wharton Fin. Insts. Ctr. Working Paper, Oct. 1998), <http://fic.wharton.upenn.edu/fic/papers/98/9805.pdf> (noting additional benefits related to increased transparency, balance sheet strength, and investor confidence commanded by the good bank, including lower-cost private capital raising).

⁸³⁶ Robert Hall & Susan Woodward, *The Right Way to Create a Good Bank and a Bad Bank*, FIN. CRISIS & RECESSION (Feb. 23, 2009), <http://woodwardhall.wordpress.com/2009/02/23/the-right-way-to-create-a-good-bank-and-a-bad-bank/>.

⁸³⁷ Holmes, *supra* note 835; Macey, *supra* note 834, at 20-29.

⁸³⁸ Macey, *supra* note 834, at 28-29.

⁸³⁹ *Id.* at 32; Hall & Woodward, *supra* note 836.

generally, contrary to the assertions of some of its proponents.⁸⁴⁰ Like contingent capital and creditor bail-in, the improvements it promises to the stability of the financial system instead are indirect at best, oriented primarily at facilitating loss imposition on creditors at minimal taxpayer expense, and are ultimately unlikely to deter a mass withdrawal of short-term funding during a financial crisis. At bottom, this is due to the fact that GBBB cannot *guarantee* short-term creditors against impairment. At best, it can supply enhanced credit protection to debt that is migrated over to the good bank and shielded with the improved coverage from the good assets. Even this advantage presupposes that regulators (aided by the institutions themselves) will be able to isolate and value the good assets in the first place, itself a doubtful exercise. But even assuming that regulators were able to distinguish an institution's good and bad assets in the middle of a panic, then carry out a swift division of its balance sheet, it still does not follow that GBBB will deter short-term creditors from running—in fact, it might induce them to run, if the result of the valuation exercise is to establish that there are not enough good assets to satisfy all of their short-term claims in full. This is largely the same problem presented by creditor bail-in, in which losses are too great to be absorbed by available bailable capital, inducing a run by short-term creditors who fear they may be next to suffer impairment. Although GBBB may be able to increase the *visibility* of the size of the cushion available to short-term creditors by stripping away bad assets, it cannot enhance the *value* of the good assets backing it. If common equity capital and long-term liabilities prove to be insufficient to absorb fully the total losses realized in the course of splitting up of good and bad assets, short-term debt will have to absorb the remainder, or else public funding will be required to fill the value gap. Short-term creditors are not likely to stay around to find out.

Again, as with bail-ins, the run of short-term creditors could theoretically be thwarted by staying withdrawals of short-term funding by creditors while a GBBB transaction is conducted, but at some point any stay will need to be lifted for the good bank to return to normal operations. If short-term creditors continue to fear for the bank's solvency after the restructuring, they will run as soon as they are lawfully able to do so. If at any point in this process the government steps

⁸⁴⁰ Hall & Woodward, *supra* note 836 (The authors urge that under the GBBB approach to resolving a failed financial institution, “no run would occur on the heavily capitalized good bank... Reorganization could proceed peacefully while the good bank went about its banking business. The claims of the shareholders and bondholders, which are inferior to those of the depositors, can be sorted out without interfering with the operation of the bank.”).

in to inject incremental funding to support the institution against a run, the public, not private funding, will have underwritten the cost (and thus assumed the risk) of protecting short-term creditors, and therefore the cost of containing contagion effects. When regulators have used GBBB, they have usually required some public funding of either the good, bad, or both banks. This was true of GBBB resolutions during the U.S. savings and loan crisis, and of some of the most prominent international examples of GBBB, such as the government of Sweden's restructuring of its banking sector in 1992 and the Irish government's ongoing efforts to rescue its banking system.

Despite its obvious shortcomings as a policy tool for managing the problem of contagion, GBBB has been used in the past with some success to resolve failed financial institutions when a contagious run did *not* present an immediate threat—the objective instead being to maximize the value of the institutions undergoing resolution. While the specific format of different GBBB transactions has varied from case to case, the FDIC in the United States and international regulators have patterned prominent reorganizations on this general archetype. In the United States, regulators have adopted two general approaches: first, one-time GBBB transactions involving the division and resolution of individual institutions, such as First City and Mellon; second, “master” GBBB transactions that pool together the bad assets of many failed institutions for consolidated long-term management, an approach exemplified by the Resolution Trust Corporation. Both are reviewed briefly below.

GBBB was deployed during the savings and loan crisis to restructure several large regional U.S. financial institutions. For example, in 1988 the FDIC used the GBBB technique to resolve First City National Bank of Houston, creating a bad bank (called the “Collecting Bank”) which received open bank assistance of \$970 million of government financing to permit the bad bank to acquire, through payments to the old bank, First City's energy and commercial real estate loans, which subsequently were liquidated over the next 15 years.⁸⁴¹ The government's assistance permitted the creditors of the bad bank to avoid impairment. Relieved of its troubled loan book, First City became an effective good bank and subsequently was able to raise \$500

⁸⁴¹ Jim Greer, *First City Turns Corner on Final Days*, HOUS. BUS. J. (Nov. 9, 2003), <http://www.bizjournals.com/houston/stories/2003/11/10/story2.html>; Holmes, *supra* note 835; FED. DEPOSIT INS. CORP., *MANAGING THE CRISIS: THE FDIC AND RTC EXPERIENCE* 567-76 (1998).

million in new private capital.⁸⁴² Ultimately, however, it continued to absorb losses on non-performing loans and, in 1992, was taken into receivership by the FDIC.⁸⁴³

Also in 1988, Mellon Bank Corporation formed the bad bank Grant Street National Bank to assume approximately \$640 million of impaired real estate loans (47% of their value at origination of \$1.4 billion).⁸⁴⁴ In contrast with First City, the bad bank in the Mellon transaction was financed privately, without the need to solicit government support.⁸⁴⁵ Instead, Grant funded the acquisition of the portfolio through the issuance of \$513 million in new sub-investment grade debt sold to investors through Drexel Burnham Lambert, supplemented with an additional \$128 million in capital (a mixture of senior and junior preferred stock and common equity) supplied to Grant by Mellon.⁸⁴⁶ Mellon also recognized \$142 million in losses on the transfer of assets to Grant, but its capital structure was otherwise kept intact, with no liabilities transferred along with the bad assets from Mellon to Grant.⁸⁴⁷ Mellon's shareholders received the Grant Street common stock through a special dividend.⁸⁴⁸ Grant Street bondholders recovered their full investment at maturity.⁸⁴⁹ Though the Mellon-Grant GBBB transaction has been applauded as an illustration of a successful implementation of the strategy free from public support,⁸⁵⁰ it depended on accommodative high-yield bond markets to provide funding for the bad bank.⁸⁵¹ During a

⁸⁴² Greer, *supra* note 841; Holmes, *supra* note 835.

⁸⁴³ Greer, *supra* note 841.

⁸⁴⁴ Stephen Kleege, *Mellon Inspires 'Bad Bank' Plans for Property Portfolios*, 156 AM. BANKER, Feb. 5, 1991; Reed Smith, *From 'Bad' Bank to 'Good'* (Client Alert 08-143, Aug. 2008); *see also* Holmes, *supra* note 835; Macey, *supra* note 834, at 13; Morrison & Foerster LLP, *Good Bank-Bad Bank: A Clean Break and a Fresh Start 5* (2009), <http://www.mofo.com/files/Publication/c9b79abf-1d65-4694-9836-635345926fa5/Presentation/PublicationAttachment/3e48d29f-602e-4fa3-abc-f-15a2830eb8ec/20090218GoodBankBadBank.pdf>.

⁸⁴⁵ Holmes, *supra* note 835; Kleege, *supra* note 844.

⁸⁴⁶ Kleege, *supra* note 844; Macey, *supra* note 834, at 13; Reed Smith, *supra* note 844 (discussing Mellon's capital contribution to Grant, including \$35 million common equity, \$90 million senior preferred, and \$3 million junior preferred).

⁸⁴⁷ Kleege, *supra* note 844; Macey, *supra* note 834, at 13.

⁸⁴⁸ Reed Smith, *supra* note 844.

⁸⁴⁹ Kleege, *supra* note 844.

⁸⁵⁰ *See, e.g.*, Macey, *supra* note 834, at 13.

⁸⁵¹ Kleege, *supra* note 844; Macey, *supra* note 834, at 21.

contagious market panic it is unlikely that private financing markets will be as receptive to large-scale split-offs of perceived toxic assets.⁸⁵²

Other examples of some form of GBBB abound in the United States.⁸⁵³ Most recently, in early 2011 Bank of America formed a new business unit called Legacy Asset Servicing to hold and service the bulk of its non-performing residential mortgage loans that were originally brought onto its balance sheet in the 2008 acquisition of Countrywide Financial.⁸⁵⁴ The unit is not structured as an independent legal vehicle or funded with new capital, so it is not technically an example of GBBB.⁸⁵⁵ Instead, its primary utility is to improve managerial focus (and transparency) by reconfiguring its organizational structure to distinguish more sharply between good and bad assets,⁸⁵⁶ potentially replicating some of the supposed efficiencies of the GBBB structure. At June 30, 2011, the Legacy Asset Servicing portfolio contained \$169.5 billion of owned loans.⁸⁵⁷

While the FDIC resolved First City and Mellon through the use of individually-tailored GBBB transactions, many other financial institutions that failed during the U.S. savings and loan crisis era were managed by regulators by pooling their bad assets together into a consolidated “master” bad bank called the Resolution Trust Corporation (RTC) for long-term disposition. To address the savings and loan crisis, the U.S. government created the RTC in August 1989 under the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA)⁸⁵⁸ to acquire bankrupt thrift institutions, strip out bad assets with the use of public funds, and then sell the good banks (with good assets and insured liabilities intact) to new acquirers. Bad assets that were

⁸⁵² Macey, *supra* note 834, at 21 (noting that “[t]he decline of this [junk bond] market makes the private financing of bad bank strategies much more difficult”); Santomero & Hoffman, *supra* note 835, at 14 (“The first use of [GBBB] was in the mid 1980s when high yield debt capital was relatively easy to come by. The subsequent collapse of the junk bond market has raised costs, and reduced the attractiveness of this alternative.”).

⁸⁵³ See Macey, *supra* note 834, at 12-14.

⁸⁵⁴ Press Release, Bank of America, Bank of America Announces Changes to Resolve Legacy Mortgage Issues and Continue Building the Leading Home Lending Business (Feb. 4, 2011), <http://mediaroom.bankofamerica.com/phoenix.zhtml?c=234503&p=irol-newsArticle&ID=1525074&highlight=>; Nelson D. Schwartz, *Bank of America to Create Troubled Loans Unit*, N.Y. TIMES, Feb. 4, 2011, <http://www.nytimes.com/2011/02/05/business/05bank.html>.

⁸⁵⁵ Schwartz, *supra* note 854.

⁸⁵⁶ *Id.*; Press Release, Bank of America, *supra* note 854.

⁸⁵⁷ BANK OF AMERICA CORP., Q. REP. (FORM 10-Q), at 36 (Aug. 4, 2011).

⁸⁵⁸ Lee Davison, *Politics and Policy: The Creation of the Resolution Trust Corporation*, 17 FDIC BANKING REV. 17, 18 (2005), <http://www.fdic.gov/bank/analytical/banking/2005jul/article2.pdf>.

not immediately marketable were retained for separate disposition by the RTC⁸⁵⁹ or, in some cases, were placed into public-private partnership vehicles that managed the sales professionally over a longer time period.⁸⁶⁰ Generally, a standard RTC resolution commenced when an insolvent thrift failed and entered conservatorship under the control of the RTC.⁸⁶¹

Upon its formation the RTC obtained control of 262 thrifts with \$115 billion in assets already operating in conservatorship.⁸⁶² By the end of the first full calendar year of its operation in December 31, 1990, the RTC had assumed conservatorship of 531 thrifts with \$278 billion in assets.⁸⁶³ The RTC resolved and disposed of the good assets and protected liabilities of failed thrifts through a variety of channels, including “purchase and assumption” (P&A) transactions, in which a healthy acquirer assumed insured deposits (and often uninsured amounts in excess of the FDIC insurance cap) and selected good assets⁸⁶⁴ or, if no ready acquirer existed, through payoffs or transfers of insured deposits.⁸⁶⁵ Approximately two-thirds of all thrifts brought under RTC control during its tenure were resolved using P&A.⁸⁶⁶ The RTC initially experimented with granting put options on loan portfolios in P&A transactions to incentivize prospective acquirers to assume more “good” assets. An acquirer that purchased a failed thrift subject to a put option received the right to sell back to the RTC any assets it later determined to be unwanted.⁸⁶⁷ This enabled buyers to take assets on a provisional basis, retaining those that proved to be good but returning others that turned out to be bad. At first the RTC embraced this strategy, selling \$40 billion of assets to buyers using put options and taking back \$20 billion after the options were exercised.⁸⁶⁸ Although use of a put option enabled the RTC to increase the total volume of dispositions, its success was mixed, typically incentivizing what the FDIC has called “cherry picking” tactics by prospective acquirers.⁸⁶⁹ The large pool of bad assets assumed by the RTC over its lifetime made retaining and managing them more economical than paying private

⁸⁵⁹ Barry Meier, *Savings and Loan Crisis May Be Guide for Bank Bailout*, N.Y. TIMES, Sept. 28, 2008, http://www.nytimes.com/2008/09/29/business/29rtc.html?ref=resolution_trust_corporation.

⁸⁶⁰ Morrison & Foerster LLP, *supra* note 844.

⁸⁶¹ FED. DEPOSIT INS. CORP., *supra* note 841, at 7.

⁸⁶² *Id.* at 14.

⁸⁶³ *Id.* at 8.

⁸⁶⁴ *Id.* at 13-18.

⁸⁶⁵ *Id.* at 18-20.

⁸⁶⁶ *Id.* at 15.

⁸⁶⁷ *Id.*

⁸⁶⁸ *Id.*

⁸⁶⁹ *Id.*

acquirers to assume them immediately in connection with P&A sales.⁸⁷⁰ In some cases, the RTC disposed of troubled loans directly through auctions⁸⁷¹ and securitizations,⁸⁷² typically entrusting the evaluation, management, and marketing tasks to private outside contractors.⁸⁷³ In others, the RTC sponsored public-private equity joint ventures to hold, manage, and dispose of troubled assets acquired from failed thrifts.⁸⁷⁴ In all, 72 public-private partnerships were created to manage \$21.4 billion of bad assets.⁸⁷⁵ Between 1989 and 1995, the RTC used \$91.3 billion of public funds to resolve 747 institutions with assets totaling \$394 billion.⁸⁷⁶ Public sector losses accounted for \$75.6 billion of a total \$82.7 billion of RTC losses.⁸⁷⁷

Regulators outside of the United States have also embraced GBBB from time to time.⁸⁷⁸ The most prominent international example of GBBB is Sweden's sponsorship of two bad banks in 1992 to assume troubled assets from the Swedish commercial banks Nordbanken and Gota after steep declines in property values and losses linked to the floating of the Swedish krona seriously undermined the stability of Sweden's financial system.⁸⁷⁹ In response, the Swedish government injected SKR 25 billion of new capital into Nordbanken, nationalizing the bank, then provided a further SKR 40 billion of new capital to a bad bank known as Securum to acquire SKR 67 billion of Nordbanken's non-performing loans.⁸⁸⁰ In conjunction with this transaction, the government injected an additional SKR 10 billion into Nordbanken, for a total SKR 50 billion investment to finance the transfer and write-off of bad assets.⁸⁸¹ Retriiva, a second government-sponsored bad bank, assumed a further SKR 38 billion of troubled assets from

⁸⁷⁰ *Id.* at 28.

⁸⁷¹ *Id.* at 30-32.

⁸⁷² *Id.* at 38-39.

⁸⁷³ *Id.* at 30.

⁸⁷⁴ *Id.* at 40-42.

⁸⁷⁵ *Id.* at 40.

⁸⁷⁶ Timothy Curry & Lynn Shibut, *The Cost of the Savings and Loan Crisis: Truth and Consequences*, 13 FDIC BANKING REV. 26, 29 (2000), http://www.fdic.gov/bank/analytical/banking/2000dec/brv13n2_2.pdf.

⁸⁷⁷ *Id.* at 32. Private RTC costs totaling \$7.1 billion were borne by the Federal Home Loan Banks and the Savings Association Insurance Fund, which initially capitalized, and contributed to interest payments of, the Resolution Funding Corporation, a public-private entity that issued \$30 billion in debt obligations in 1990 and 1991 to provide funds for the RTC. *Id.*

⁸⁷⁸ See Macey, *supra* note 834, at 15 (citing proposed or actual usage of GBBB, at various times, in France, Germany, the Czech Republic, the Slovak Republic, Thailand, China, New Zealand, Brazil, and Japan).

⁸⁷⁹ Macey, *supra* note 834, at 11, 16; Santomero & Hoffman, *supra* note 835, at 23-24; see also Peter Sederowsky, *Sweden-Legal Report*, INT'L FIN. L. REV. (Special Supplement, July 1994).

⁸⁸⁰ Santomero & Hoffman, *supra* note 835, at 24.

⁸⁸¹ Peter Went, *Lessons from the Swedish Bank Crisis 6-7* (GARP Research Center, Feb. 14, 2009).

Gota.⁸⁸² Gota and Nordbanken resumed operating as good banks, stripped of bad assets by the government while retaining their remaining performing loans books. Despite the recapitalization, Gota ultimately failed in late 1992⁸⁸³ and was acquired by Nordbanken in a SKR 3.1 billion transaction that created Sweden's largest bank.⁸⁸⁴ The transactions involved large amounts of public funding to support the GBBB reorganization and later the merger. Both the bad banks, Securum and Retriva, were owned by the Swedish government, operating as asset management companies with a mandate to dispose of their portfolios, comprising a majority of real estate assets and some corporate loans,⁸⁸⁵ over a 10 to 15 year period.⁸⁸⁶ Securum's management was given significant latitude to design its asset disposition plan.⁸⁸⁷

Despite the high level of public financial support for the bad banks (and also, in the Swedish case above, for the good bank), critics have praised the success of these transactions.⁸⁸⁸ New Zealand,⁸⁸⁹ the Czech and Slovak republics,⁸⁹⁰ and, during the financial crisis, Switzerland (UBS)⁸⁹¹ are among many other countries that have used GBBB to restructure financial institutions in their domestic banking systems. Still ongoing is the Irish government's sweeping reorganization of its largest banking entities, including Allied Irish Banks, Bank of Ireland, and Anglo Irish Bank, through a government-sponsored "master" bad bank called the National Asset

⁸⁸² Santomero & Hoffman, *supra* note 835, at 24.

⁸⁸³ Pierre Harkay, *What Options to Solve Systemic Banking Crises?* 25 (Universiteit Maastricht, Faculty of Econ. & Bus. Admin., 2009), <http://arno.unimaas.nl/show.cgi?fid=17618>.

⁸⁸⁴ Santomero & Hoffman, *supra* note 835, at 24.

⁸⁸⁵ Went, *supra* note 881, at 7.

⁸⁸⁶ *Id.* at 7-8; Harkay, *supra* note 883, at 25-26.

⁸⁸⁷ Clas Bergström, Peter Englund & Per Thorell, *Securum and the Way out of the Swedish Banking Crisis 1* (Summary of a report commissioned by SNS, Center for Business and Policy Studies, Translated by Timothy Chamberlain, May 2003), http://www.sns.se/document/securum_eng.pdf.

⁸⁸⁸ Carter Dougherty, *Stopping a Financial Crisis, the Swedish Way*, N.Y. TIMES, Sept. 22, 2008, <http://www.nytimes.com/2008/09/23/business/worldbusiness/23krona.html>; Russell Hotten, *UK Turned to Nordic Bail-out*, TELEGRAPH, Oct. 13, 2008, <http://www.telegraph.co.uk/finance/financetopics/financialcrisis/3190488/UK-turned-to-Nordic-bail-out.html>.

⁸⁸⁹ Chris Hunt, *Banking Crisis in New Zealand—An Historical Perspective*, 72 RESERVE BANK OF NEW ZEALAND: BULLETIN, Dec. 2009, at 26, 35, http://www.rbnz.govt.nz/research/bulletin/2007_2011/2009dec72_4hunt.pdf.

⁸⁹⁰ Michael S. Borish et al., *Banking Reform in Transition Economies*, 32 FIN. & DEV. 23-26 (1995).

⁸⁹¹ *SNB Cuts Value of Toxic UBS Asset Fund by a Third*, REUTERS, Feb. 10, 2009, <http://uk.reuters.com/article/idUKLA75333720090210>.

Management Agency (NAMA).⁸⁹² NAMA's business plan, originally published in draft format in October 2009, calls for the issuance of government-backed debt to finance the purchase of troubled real estate assets from Irish commercial bank balance sheets,⁸⁹³ including the several institutions that have been nationalized by the Irish government, most recently Allied Irish Banks Plc.⁸⁹⁴ Through July 2012, NAMA had used €32 billion in government-guaranteed securities to acquire a portfolio of 11,500 property-related loans⁸⁹⁵ with balances of €74 billion.⁸⁹⁶ The government's plan has been heavily criticized as amounting essentially to a complete government bailout of the Irish financial system, funded with public money.⁸⁹⁷ In response to this criticism, the Irish government has imposed roughly €15 billion of losses on subordinated bondholders of Irish banks.⁸⁹⁸ For example, the Bank of Ireland, implementing its intention to "maximise burden sharing" with private creditors,⁸⁹⁹ generated €5.2 billion of mandatory capital between March 2009 and April 2012 by seeking and imposing discounted buy-backs and share swaps with subordinated debt holders.⁹⁰⁰ With the continued decline of Irish property prices,

⁸⁹² John M. Brown, *Ireland's Nama Tasked to Acquire Toxic Bank Assets at a Discount*, GULFNEWS, Oct. 2, 2010, <http://gulfnnews.com/business/economy/ireland-s-nama-tasked-to-acquire-toxic-bank-assets-at-a-discount-1.690305>; Dara Doyle, *Irish Bad Bank Sees EU5.5 Billion Profit in Gamble*, BLOOMBERG, Oct. 15, 2009, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aTksIzeFX4vk>; Nat'l Asset Mgmt. Agency, <http://www.nama.ie/>.

⁸⁹³ Nat'l Asset Mgmt. Agency, *Draft NAMA Business Plan*, Oct. 13, 2009, <http://www.finance.gov.ie/documents/pressreleases/bl112.pdf>.

⁸⁹⁴ See, e.g., Finbarr Flynn, *Ireland to Take Majority Ownership of AIB in Bailout*, BLOOMBERG BUSINESSWEEK, Sept. 30, 2010, <http://www.businessweek.com/news/2010-09-30/ireland-to-take-majority-ownership-of-aib-in-bailout.html>.

⁸⁹⁵ Neil Callanan & Rob Urban, *Ireland's Bad Bank Transforms Debtors Into Landlords: Mortgages*, BLOOMBERG, Apr. 13, 2012, <http://www.bloomberg.com/news/2012-04-12/ireland-s-bad-bank-transforms-debtors-into-landlords-mortgages.html>.

⁸⁹⁶ Frank Daly, Chairman, Nat'l Asset Mgmt. Agency, *Address to the Governing Council of the Royal Institution of Chartered Surveyors* (July 2, 2012), <http://www.nama.ie/Publications/2011/FrankDalyStatementToOireachtasFinanceCommittee9Sept2011.pdf>.

⁸⁹⁷ See, e.g., Louisa Fahy & Simone Meier, *Government 'Squandering' Money in Bank Bailout Plan*, INDEPENDENT, Oct. 7, 2009, <http://www.independent.ie/business/irish/government-lsquosquanderingrsquo-money-in-bank-bailout-plan-1906787.html>; Michael Lewis, *When Irish Eyes Are Crying*, VANITY FAIR, Mar. 2011; David McWilliams, *Nama is Highway Robbery*, DAILY BUS. POST, Oct. 11, 2009, <http://www.sbpost.ie/commentandanalysis/nama-is-highway-robbery-44915.html>.

⁸⁹⁸ Dara Doyle & Joe Brennan, *Irish Tell Spain to Imagine The Worst in Banking Bailout*, BLOOMBERG, June 14, 2012, <http://www.bloomberg.com/news/2012-06-14/irish-tell-spain-to-imagine-the-worst-in-banking-bailout.html>.

⁸⁹⁹ Sharlene Goff & John Murray Brown, *Irish Lenders Outline Loss Plans for Bondholders*, FIN. TIMES, May 31, 2011, <http://www.ft.com/cms/s/0/359d2e7a-8bb2-11e0-a725-00144feab49a,s01=1.html#axzz1O4Mx5jnm>.

⁹⁰⁰ Simon Carswell, *Noonan Backs off Burning BoI Bondholders*, IRISH TIMES, Dec. 3, 2011, <http://www.irishtimes.com/newspaper/finance/2011/1203/1224308522323.html>.

NAMA no longer predicts it will unload its assets by 2020 at a profit, but instead predicts that it will break even.⁹⁰¹

Spain too has contemplated a GBBB-based approach to the resolution of its troubled banking sector.⁹⁰² However, until recently, Spain was reluctant to implement such a strategy both due to the high costs exemplified by the Irish experience⁹⁰³ and due to the prevalence of individual retail investment in banks' preferred stock.⁹⁰⁴ Given capital structure rules, those retail investors would necessarily be wiped out before any losses could be imposed on subordinated debt holders, which would be a particularly unpopular move.⁹⁰⁵ As of July 8, 2012, Spain is likely to create a single bad bank to house its banks' bad assets. This turn of sentiment followed a meeting of E.U. finance ministers in Brussels during which it was determined that Spain must create a bad bank in order to access up to €100 billion of aid.⁹⁰⁶

Past field-testing of GBBB is supposedly an advantage of this approach relative to other competing (but untested) resolution models, but its actual historical record is mixed at the best. First, GBBB has not proven to be viable as a strictly private resolution tool. Instead it usually has required public financial support whenever regulators have deployed it against a background of severe economic dislocation, for example, in the recent cases of Sweden and Ireland. Second, GBBB has not been rigorously tested as a stand-alone strategy for containing the spread of contagion in the financial system. Many of the most prominent U.S. cases of GBBB, for example, date to the savings and loan era, a classic example of asset shock that did not involve contagious runs or mass fire sales of troubled assets by failing institutions. When regulators *have* used GBBB to resolve financial institutions in contagious environments, they have typically done so only in conjunction with explicit public guarantees of customer deposits and other systemically relevant debt instruments. Ireland, for instance, guaranteed all deposits and debt

⁹⁰¹ *Ireland's Bad Bank No longer Expects to Make Profit*, REUTERS, Jul. 5, 2012, <http://in.reuters.com/article/2012/07/05/ireland-badbank-idINL6E8158ZI20120705>.

⁹⁰² Alex Barker, Miles Johnson & Hugh Carnegie, *Spain Bows to 'Bad Bank' Idea*, FIN. TIMES, Jul. 8, 2012.

⁹⁰³ *Id.*

⁹⁰⁴ Doyle & Brennan, *supra* note 898.

⁹⁰⁵ *Id.*

⁹⁰⁶ Barker et al., *supra* note 902.

instruments issued by its six major banking institutions in September 2008,⁹⁰⁷ before forming NAMA one year later to manage the resolution of the Irish financial system.

At other times regulators have been compelled to drop the GBBB approach altogether when they faced a developing contagious run. At a relatively early stage in the financial crisis of 2007-2009, U.S. regulators abandoned plans for using TARP as a ring-fencing mechanism for funding purchases of bad assets from U.S. financial institutions, after it became clear that this strategy would not be effective at halting the mass exit of investors from financial institutions and short-term capital markets.⁹⁰⁸ Although not technically qualifying as a GBBB transaction, TARP presented regulators with similar practical challenges, including how to distinguish and value good and bad assets in a disorderly market environment. The U.S. government ultimately deployed the federal funding allocated to TARP in the form of equity investments in major U.S. banks under the Capital Purchase Program (CPP).⁹⁰⁹ At the time it made the CPP investments, the government already had been compelled to issue unprecedented guarantees of all bank deposits, MMMF investments, and unsecured senior bank debt in the U.S. financial system. Public guarantee of short-term debt, not GBBB resolution, thus became the policy instrument primarily responsible for stopping the spread of contagion. Third, repeated historical usage has yielded no unified template for GBBB. Regulators have used the resolution method on an ad hoc and customized basis, adapting it to the unique pattern of exigencies that characterized the particular financial crisis they faced. At least so far, GBBB has been guided by significant regulatory discretion, making it the polar opposite of a bright-line set of ex ante rules and assurances that short-term debt holders likely require to be deterred from running.

Since the financial crisis of 2007-2009, some efforts have been made toward developing models of GBBB that would be more generally applicable and less dependent on public funding.

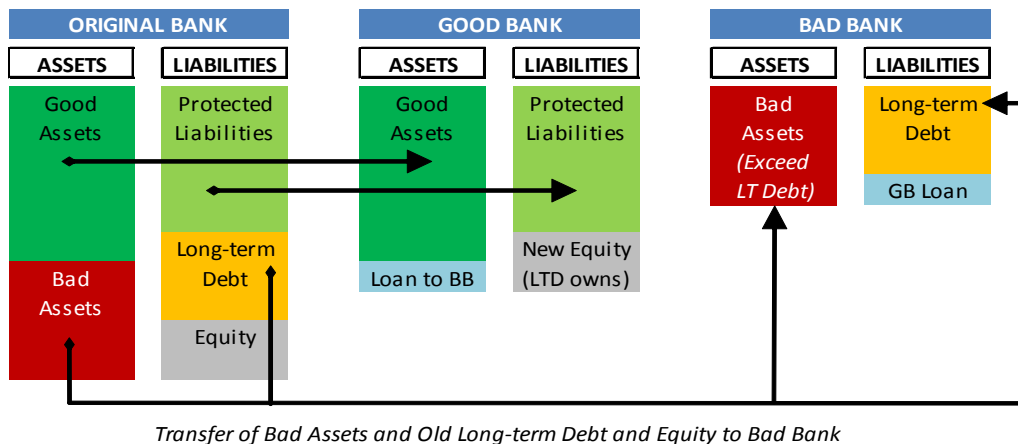
⁹⁰⁷ Dept. of Fin., Government Decision to Safeguard Irish Banking System, Sept. 30, 2008, <http://www.finance.gov.ie/documents/pressreleases/2008/blo11.pdf>.

⁹⁰⁸ Krishna Guha & Michael Mackenzie, *US Drops Plan to Buy Toxic Assets*, FIN. TIMES, Nov. 12, 2008, <http://www.ft.com/intl/cms/s/0/6cdb3ee0-b0ef-11dd-8915-0000779fd18c.html#axzz1YWJwFBeh>.

⁹⁰⁹ Press Release, U.S. Dep't of the Treasury, Treasury, Regulators Issue Additional Guidance on Capital Purchase Program (Oct. 20, 2008), <http://www.treasury.gov/press-center/press-releases/Pages/hp1222.aspx>; Press Release, U.S. Dep't of the Treasury, Treasury Issues Additional Information on Capital Purchase Program (Oct. 31, 2008), <http://www.treasury.gov/press-center/press-releases/Pages/hp1247.aspx>.

Hubbard, Scott, and Zinagles (2009),⁹¹⁰ for example, outline a form of GBBB in which the bad bank acquires the non-performing loan portfolio of the original bank and assumes its original long-term debt, with any funding gap filled by a new loan from the good bank (see Figure 2.11 below). This loan, the authors note, “is necessary because the long-term debt of the original bank is not likely to be sufficient to fund the assets of the bad bank.”⁹¹¹ Old equity holders receive new equity in the bad bank, likely having only nominal value. The good bank then acquires the good assets from the original bank and assumes all of its FDIC-guaranteed liabilities (including insured deposits). In practice, however, the good bank will probably have to assume *all* of the original short-term debt, even if it is not subject to an explicit government guarantee, in order to prevent short-term creditors from running. Former long-term debt holders in the original bank become pro forma owners of shares issued by the good bank, providing them with upside exposure to the operating performance of the good bank. Following the split, the recapitalized good bank, now stripped of its bad assets and its excess liabilities, returns to normalized operations, including writing new loans, accepting new customer deposits, and issuing other debt, supposedly free from the risk of disruptions caused, for instance, by having to engage in fire sales of assets to meet redemption requests by fleeing depositors or other short-term creditors in a distressed situation. The bad bank is run as a liquidating “closed-end mutual fund” until all impaired assets are sold off in an orderly manner by its managers.⁹¹²

Figure 2.11: Hubbard, Scott, and Zingales Illustrative GBBB Transaction



⁹¹⁰ R. Glenn Hubbard et al., *Banks Need Fewer Carrots and More Sticks*, WALL ST. J., May 6, 2009, <http://online.wsj.com/article/SB124157669428590515.html>.

⁹¹¹ *Id.*

⁹¹² *Id.*

Hall and Woodward (2009)⁹¹³ propose using GBBB to divide a failed financial institution into a good bank, which retains all good assets and operates normally, and a bad bank, structured as a “financial fund with no operating functions” containing all of the bad assets of the original institution for the purpose of disposing of them in an orderly manner. The fund then commences a gradual liquidation, operating in run-off until all of its bad assets have been sold.⁹¹⁴ Their model is similar in most respects to the Hubbard, Scott, and Zingales proposal, only here the fund owns the good bank’s equity in the form of an asset carried on the balance sheet alongside its portfolio of troubled assets (rather than distributing out the equity directly to long-term creditors).⁹¹⁵ This makes the creditors and shareholders of the fund effective but indirect owners of the good bank, arguably giving them an incentive to promote the good bank’s operations. Cross-ownership of both banks must be carefully structured so that the two are not consolidated for accounting or regulatory purposes.⁹¹⁶

In theory, under both proposals public involvement is kept to a minimum (but not absolutely ruled out), since the bad bank’s financing needs are supplemented by the old long-term debt, which is wholly transferred to the bad bank, plus funding from the good bank, while the guaranteed liabilities are protected by the good assets held at the good bank. There are at least four scenarios, however, in which public support might become necessary. First, these good assets may be insufficient to cover all of the good bank’s guaranteed liabilities and any short-term debt that could opt to run rather than risk impairment. This is essentially the same problem facing creditor bail-in when a financial institution incurs losses that are large enough to exhaust all of its longer-term liabilities and have to be absorbed by systemically relevant short-term ones, provoking a run. Or looked at from another perspective, the amount of long-term debt that becomes equity in the good bank is not sufficient to capitalize the good bank. Second, over the longer term, the loan underwritten by the good bank to support the bad bank could become impaired, for example if the bad bank recovers less from the disposition of its bad assets than

⁹¹³ Hall & Woodward, *supra* note 836.

⁹¹⁴ See Willem Buiters, *The ‘Good Bank’ Solution*, MAVERECON (Jan. 29, 2009), <http://blogs.ft.com/maverecon/2009/01/the-good-bank-solution/>.

⁹¹⁵ Hall & Woodward, *supra* note 836.

⁹¹⁶ Morrison & Foerster LLP, *supra* note 844, at 2.

expected, causing the good bank to incur loan losses that render it insolvent in the worst case. Third, public support could be necessary if the loan from the good bank proves not to be feasible at all, for instance because it is financially too risky or politically unpopular. Fourth, even if coverage from the good assets is sufficient, and the inter-bank loan ultimately proves to be creditworthy, holders of guaranteed liabilities could run anyway, rather than assume the (from their standpoint) unnecessary risk of staying invested while the workout of the original bank proceeds. Under any of these scenarios, public support will be required to fund the transaction, as it has been in many historical instances of GBBB.

These scenarios, perhaps always problematic, are especially likely to present serious difficulties for regulators dealing with failing institutions in a contagious environment, where mass withdrawals and forced asset sales depress market pricing, lowering the amount of protection afforded from the good assets, and encourage mass exits by depositors and other short-term creditors. In this setting, the difficulty of determining the intrinsic value of good and bad assets independent of market prices will be acute, perhaps leading creditors to suspect the credibility of regulatory valuations. Neither GBBB approach can reliably rule out the use of public support under all circumstances. Perhaps for this reason, several GBBB proponents such as Holmes (2009)⁹¹⁷ and Buitter (2009)⁹¹⁸ concede that public ownership or a guarantee of one or both of the banks may be required,⁹¹⁹ both to avert a run and to buy time for regulators to analyze and sort assets into good and bad categories.

iv. Other Resolution Approaches: Living Wills and Dodd-Frank Orderly Liquidation for Systemically Important Financial Institutions

The financial system's pervasive dependency on leverage, and especially on short-term funding, is widely seen to transform any delay in the process of resolving failing institutions into a source of systemic risk. Delay means more time for short-term creditors to run, and loss of franchise value. Following the financial crisis of 2007-2009, many believe these risks are acute for large, complex, or otherwise systemically important non-bank financial institutions as well as banks. Much of the energy invested in the design of replacement resolution policies has thus

⁹¹⁷ Holmes, *supra* note 835.

⁹¹⁸ Buitter, *supra* note 914.

⁹¹⁹ Morrison Foerster, *supra* note 844, at 7-8.

been channeled toward finding ways to expedite the resolution process for this special class of non-bank financial institutions. The last two approaches surveyed in this section—the living will and the FDIC’s newly developed orderly liquidation procedures governing resolution of systemically important financial institutions—have been developed with this objective in mind. In contrast with creditor bail-in and GBBB, for which no regulatory scheme is presently in effect, both living wills and orderly liquidation have been incorporated in Dodd-Frank. Living wills, in addition, now command the wide endorsement of regulators internationally. Proponents of both approaches urge that, by hastening the resolution of complex financial institutions, they will be able to avert contagious runs. Unfortunately, this seems unlikely to prove to be true during a crisis. Living wills, even if they facilitate a high-speed resolution, cannot independently assure short-term creditors of an unimpaired recovery of their investments, so they will not deter those creditors from withdrawing as soon as a struggling financial institution appears to be in danger of failing. Orderly liquidation, likewise, cannot (and, according to the FDIC, expressly *does not*) guarantee short-term financial creditors a recovery, so it too will not deter contagious runs. Thus neither approach solves the pervasive problem of contagion in the financial system.

(1) Living Wills

Living wills are “plans or strategies to be developed by specified large complex financial institutions...for winding down their operation if and when they become insolvent with minimum disruption both to themselves and to the economy.”⁹²⁰ Their purpose is to aid swift resolution of complex financial institutions by stipulating how the process will unfold and identifying what resources must be marshaled to complete it in advance of a crisis.⁹²¹ Though some argue that advance planning mandated by living wills will minimize disruption to financial markets in the event of a major financial institutional failure, they are not likely to deter contagious runs by short-term creditors. Living wills supply regulators with critical information to aid them if resolution is necessary in the future, but do not represent a stand-alone resolution

⁹²⁰ George Kaufman, *Living Wills: Putting the Caboose before the Engine and Designing a Better Engine* 1 (Working Paper, 2010), <http://ssrn.com/abstract=1599787>.

⁹²¹ *Id.*; see also SCOTT & GELPERN, *supra* note 486, at 283.

mechanism in their own right,⁹²² so they cannot cure the basic defect common to all resolution-based approaches, i.e., the containment of contagion effects that prioritize the imposition of losses on creditors. Furthermore, if a living will is to serve as more than just an itemized list of assets and liabilities, it must make a complicated set of assumptions about the shape of the future financial crises in which it might be tested. Plans that are too specific will be ineffective in a wide range of possible alternative scenarios; those that are too broad in their design will require regulators to fill in most of the detail in the midst of a crisis, negating the public cost-savings that they promise in principle. Above all, living wills offer short-term creditors no incremental assurances, either in the form of a guarantee, or in the more moderate form of a cushion, that they will not be impaired. Since living wills neither augment a financial institution's capitalization, reducing the likelihood of failure, nor provide protection to short-term creditors for institutions that do fail, they accordingly cannot provide any incremental deterrence and containment of contagious runs.

Living wills primarily reflect awareness that the multi-line and multi-country business model of the world's largest financial companies has created organizational complexities that cannot be efficiently resolved through administrative or judicial bankruptcy channels without significant advance preparation.⁹²³ The collapse of Lehman Brothers and AIG in 2008 has reinforced this sense. Figures compiled by Kaufman (2010) illustrate why. Lehman Brothers Holdings incorporated nine banks, three insurance companies, 84 mutual and pension funds, 210 other financial subsidiaries, and 127 "non-financial" subsidiaries—in all, 433 subsidiaries in 20 countries—less than a year before its collapse.⁹²⁴ These numbers pale beside Citigroup, which encompassed 101 banks, 35 insurance companies, 706 mutual and pension funds, and over 1,500 other financial and non-financial subsidiaries at year end 2007.⁹²⁵ Statistics for other "large complex financial institutions" (LCFIs) such as Bank of America, JPMorgan Chase, and Deutsche Bank paint a similar portrait of geometric organizational complexity at the larger end

⁹²² Thomas Huertas, Director, Banking Sector, Financial Services Auth., Text of Speech at CCBS/FMG Conference, London, U.K. (Feb. 26, 2010), http://www.fsa.gov.uk/pages/Library/Communication/Speeches/2010/0226_th.shtml (noting that, in the context of living wills, "[t]he actual resolution plan (choice among resolution methods) is for the authorities to develop").

⁹²³ Kaufman, *supra* note 920.

⁹²⁴ *Id.* at 19-20.

⁹²⁵ *Id.* at 1-2, 19.

of the financial services industry.⁹²⁶ This imposes public transaction costs on the resolution process of any LCFI. Living wills are possibly one way to cope with these costs by requiring managers to maintain “inventor[ies of]...all assets and liabilities,” catalogue derivatives counterparties, formulate a plan to maintain core operations and customer services during a workout, and take steps in advance to address complications related to the cross-border nature of contemporary banking.⁹²⁷ Living wills are in effect a way for managers and regulators to rehearse for resolution by choreographing the steps they would need to take when the time comes.

Living wills, it is hoped, may also encourage leaders of financial firms to simplify their organizational structures. Former FDIC chairman Sheila Bair stated “the FDIC and the Fed must be willing to insist on organizational changes that better align business lines and legal entities well before a crisis occurs.”⁹²⁸ Bair contends that this structural simplification will allow management—as well as regulators—to better understand and monitor risks and interrelationships between business lines.⁹²⁹ Andrew Kuritzkes, who has argued in favor of a tax of \$1 million per subsidiary on large financial institutions, sees additional benefits to structural simplification.⁹³⁰ Encouraging structural simplicity would combat large-firm externalities created by cross-border activity, legal complexity, and regulatory forum-shopping.⁹³¹

Perhaps because the function served by living wills is to reduce apparent transaction costs related to resolution that otherwise would be absorbed by regulatory agencies, they have garnered widespread support of lawmakers and regulators both in the United States and abroad,

⁹²⁶ *Id.* at 19.

⁹²⁷ *Id.* at 2.

⁹²⁸ Sheila Bair, Chairman, Federal Deposit Ins. Corporation, Remarks at the 47th Annual Conference on Bank Structure and Competition (May 5, 2011), <http://www.fdic.gov/news/news/speeches/chairman/spmay0511.html>.

⁹²⁹ *Id.*

⁹³⁰ Andrew Kuritzkes, *Session 1: Presentation of the Geneva Report*, in *A SAFER WORLD FINANCIAL SYSTEM: IMPROVING THE RESOLUTION OF SYSTEMIC INSTITUTIONS* 121-22 (Stijn Claessens et al., eds., 2010), <http://personal.vu.nl/d.schoenmaker/Geneva12.pdf>.

⁹³¹ *Id.* at 122.

particularly in the United Kingdom.⁹³² In May 2010, the FDIC proposed that insured depositories with \$10 billion in total assets that are subsidiaries of bank holding companies with \$100 billion in total assets develop contingency plans for separating from their parent.⁹³³ Title 1, §165(d) of Dodd-Frank requires all systemically important financial institutions to develop advance resolution plans to be reviewed and approved by regulators.⁹³⁴ Specifically, the Act requires the Federal Reserve Board to require all supervised non-bank financial institutions and bank holding companies with greater than \$50 billion in assets to make regular reports to the Federal Reserve, FSOC, and the FDIC on their advance planning for orderly resolution.⁹³⁵ Sheila Bair has called living wills a “key element” of the resolution rules for systemically important financial institutions of Dodd-Frank.⁹³⁶ During her tenure, the FDIC, together with the Federal Reserve, issued proposed rules concerning living wills.⁹³⁷ On November 1, 2011 the FDIC and Federal Reserve issued the final rule concerning living wills.⁹³⁸

Under the Dodd-Frank Act and the final rules, acceptable plans must detail the “ownership, structure, assets, liabilities, and contractual obligations of the company and identify cross-guarantees tied to different securities, major counterparties, and a process for determining to whom the collateral of the company is pledged.”⁹³⁹ They must articulate how insured depository subsidiaries of a bank holding company are protected from risk associated with its

⁹³² In the United Kingdom, for example, Adair Turner, chairman of the FSA, has been an early and persistent advocate for the use of living wills by systemically important financial institutions. *See, e.g.*, Adair Turner, Chairman, FSA, Text of Turner Review Conference: Progress Towards Global Regulatory Reform (Nov. 2, 2009), http://www.fsa.gov.uk/pages/Library/Communication/Speeches/2009/1102_at.shtml; Patrick Jenkins & Brooke Masters, *FSA’s Turner Backs Living Wills for Banks*, FIN. TIMES, Sept. 2, 2009, <http://www.ft.com/cms/s/0/d67f2976-9805-11de-8d3d-00144feabdc0.html#axzz199IVjyJB>.

⁹³³ Fed. Deposit Ins. Corp., Special Reporting, Analysis and Contingent Resolution Plans at Certain Large Insured Depository Institutions, 75 Fed. Reg. 27,464 (May 17, 2010), <http://edocket.access.gpo.gov/2010/2010-11646.htm>; *see* SCOTT & GELPERN, *supra* note 486, at 283.

⁹³⁴ Dodd-Frank Act § 165(a), (d).

⁹³⁵ *Id.*

⁹³⁶ Sheila Bair, Chairman, Fed. Deposit Ins. Corp., Text of 2010 Glauber Lecture at the John F. Kennedy Jr. Forum, Harvard University: Ending Too Big to Fail: The FDIC and Financial Reform (Oct. 20, 2010), <http://www.fdic.gov/news/news/speeches/chairman/spoct2110.html>; *see also* Sheila Bair, Chairman, Fed. Deposit Ins. Corp., Statement on Systemically Important Institutions and the Issue of “Too Big to Fail” Before the Financial Crisis Inquiry Commission (Sept. 2, 2010), <http://www.fdic.gov/news/news/speeches/chairman/spsep0210.html>; Bill McConnell, *Resolving Resolution*, THE DEAL, Oct. 29, 2010, <http://www.thedeal.com/newsweekly/insights/resolving-resolution.php>.

⁹³⁷ Resolution Plans and Credit Exposure Reports Required, 76 Fed. Reg. 22,648 (proposed Apr. 22, 2011).

⁹³⁸ 76 Fed. Reg. 67,323 (Nov. 1, 2011).

⁹³⁹ Bair, Statement on Systemically Important Institutions and the Issue of “Too Big to Fail,” *supra* note 936; Dodd-Frank Act § 165(d)(1)(B)-(C).

non-bank activities.⁹⁴⁰ The proposed rules also “require a strategic analysis by the covered company of how it can be resolved under Title 11 of the U.S. Code (the “Bankruptcy Code”) in a way that would not pose systemic risk to the financial system.”⁹⁴¹ The Federal Reserve will then review plans submitted by covered institutions.⁹⁴² Institutions that fail to submit living wills for review or that submit deficient plans may be subject to higher capital and liquidity requirements as well as more constraining activity restrictions.⁹⁴³ Dodd-Frank empowers the Federal Reserve and the FDIC, in consultation with FSOC, to require institutions to divest “assets or operations” that would interfere with an orderly resolution.⁹⁴⁴

One hundred twenty-four large financial firms are required to submit living wills to the Federal Reserve and FDIC by the end of 2013. The nine banks with over \$250 billion in assets, including five domestic banks and four foreign banks, filed their initial plans by the July 1, 2012 deadline. The detailed portions of the plans were kept confidential, while the public portions of the plans provide little beyond information found in public financial filings. Regulators have indicated that they will not impose sanctions for deficient plans at this stage. It is expected that there will be a back-and-forth period with regulators to improve the plans, likely over several months.⁹⁴⁵

Reducing the sizable transaction costs incurred by regulators to resolve large financial institutions through living wills will not reduce the risk of contagion in the financial system, however. Short-term creditors that fear the risk of the failure of a major financial institution will not be reassured by living wills, and in fact may be more likely to run if a will credibly commits to impose losses on them in resolution. Since living wills are unable to deter runs by fearful creditors, they are not an antidote to the problem of financial contagion.

⁹⁴⁰ Dodd-Frank Act § 165(d)(1)(A).

⁹⁴¹ 76 Fed. Reg. at 22,649 (Apr. 22, 2011).

⁹⁴² Dodd-Frank Act § 165(d)(3).

⁹⁴³ *Id.* § 165(d)(5)(A).

⁹⁴⁴ *Id.* § 165(d)(5)(B).

⁹⁴⁵ Morrison & Foerster LLP, *Living Wills: The Final Rule, A User Guide* (Nov. 2011), www.mofo.com/files/Uploads/Images/110905-Living-Wills.pdf.

(2) Orderly Liquidation Authority under Dodd-Frank⁹⁴⁶

Certain provisions in the Dodd-Frank Act may arguably make contagion more likely because they limit the ability to inject public support. This could be the case with the Orderly Liquidation Authority (OLA) contained in Title II of the Dodd-Frank Act, which created a new regime for receivership of financial companies whose failures “would have serious adverse effects on the financial stability in the United States.”⁹⁴⁷ As such, OLA is intended to offer regulators an alternative to bankruptcy proceedings. OLA applies to “financial companies,” which includes bank holding companies, nonbank financial companies that have been designated as systemically important, and certain registered brokers and dealers.⁹⁴⁸ In order to be placed into receivership under OLA, the “covered” financial company must be designated as posing systemic risk in the event of failure, and it must be in default or in danger of default. This determination is not made until the eve of bankruptcy and is entirely separate and distinct from the determination of whether a non-bank financial institution is systemically important, with the associated consequence of Fed supervision.

Once the company is in receivership, the FDIC takes over the process and has broad authority to arrange for the sale of the company’s assets. The FDIC may also create a “bridge financial company” and borrow from the Treasury to capitalize the liquidation fund, but Dodd-Frank limits these actions. To start, this is not a permanent solution: bridge financial companies may last for only two years, or up to five years with extensions.⁹⁴⁹ Second, the FDIC may not provide simple capital injections funded by the Treasury. Rather, the Treasury must be paid back with a reasonable rate of interest. If the assets of the company are insufficient to do so, then they must be clawed back from creditors or from the market. In other words, the process acts more like a liquidity facility than a bailout or insurance fund. There are also limitations on how much can be borrowed. In the first 30 days, before the FDIC has had the opportunity to determine the real value of the company’s assets, it can borrow only 10% of the assets reported on the

⁹⁴⁶ Portions of the text and analysis of this section are from the CCMR’s letter of November 15, 2010 to the FDIC. *See* Comm. on Capital Mkts. Reg. comment letter to the Federal Deposit Insurance Corporation Advance Notice of Proposed Rulemaking regarding Implementing Certain Orderly Liquidation Authority Provisions of the Dodd-Frank Wall Street Reform and Consumer Protection Act, 75 Fed. Reg. 64,173, Nov. 15, 2010, http://www.capmksreg.org/pdfs/2010.11.15_FDIC_letter.pdf [hereinafter CCMR Letter to FDIC].

⁹⁴⁷ Dodd-Frank Act § 203.

⁹⁴⁸ *Id.* §§ 102, 201.

⁹⁴⁹ *Id.* § 210(h)(12).

company's last financial statement.⁹⁵⁰ After that period, once the FDIC has established the real value, it may borrow up to 90% of the fair value of the assets.

This system is designed for the purpose of preserving the value of the assets rather than to avoid impairing creditors. Thus certain classes of creditors will certainly be impaired once a company enters the OLA process. Indeed, FDIC Chairman Martin Gruenberg recently outlined the OLA process and stated that “the FDIC will estimate the extent of losses in the receivership and apportion these losses to the firm's equity and subordinated and unsecured debt holders according to their order of priority.”⁹⁵¹ The FDIC has further clarified that the unsecured debt issued by the parent company, which on average constitutes 85% of the consolidated entity's unsecured debt, should absorb any losses remaining after those imposed on shareholders.⁹⁵²

The outlook is even grimmer for banks. OLA applies to bank holding companies but not to their deposit-taking subsidiaries. Deposit-taking banks are still subject to the Federal Deposit Insurance Act, but the Dodd-Frank Act eliminated one important aspect of the former regime. Dodd-Frank effectively eliminated open bank assistance, which allowed the FDIC to provide loans, purchase assets, assume liabilities, and even provide cash contributions in order to prevent an insured bank from failing.⁹⁵³

Together, these changes, which prohibit injecting public support except in the most limited ways, may actually increase the likelihood of contagion because creditors know they are at risk. Moreover, because they apply only to institutions determined to be systemically important, and apply to banks only at the holding company level, all other institutions will be subject to the bankruptcy regime where impairment is even more likely. Determining whether a financial institution is systemically important or not, either ex ante or on the eve of

⁹⁵⁰ *Id.* § 210(n)(6).

⁹⁵¹ Martin J. Gruenberg, Acting Chairman, Fed. Deposit Ins. Corp., Remarks at the Federal Reserve Bank of Chicago Bank Structure Conference (May 10, 2012), <http://www.fdic.gov/news/news/speeches/chairman/spmay1012.html>.

⁹⁵² Andrew Gray, Fed. Deposit Ins. Corp., Editorial Response, *A Third Way Between a Bankruptcy Filing and Bailout*, WALL ST. J., June 27, 2012, <http://online.wsj.com/article/SB10001424052702304870304577490790859503820.html?KEYWORDS=orderly+liquidation+authority>.

⁹⁵³ *Id.* § 1106(b).

bankruptcy,⁹⁵⁴ and whether a financial institution is in danger of default poses significant challenges for regulators. If short-term debt holders do not know whether their issuer will be deemed systemically important, then they will not know which resolution principles will apply to them, compounding uncertainty in the marketplace. Moreover, because the regulators have significant discretion in determining the circumstances that constitute danger of default the OLA adds another layer of uncertainty for creditors of financial companies who could run at an earlier point in time in order to avoid impairment in the OLA receivership.

Since late 2010, the FDIC has concentrated on developing specific new procedures to govern the OLA process. In July 2011, after two rounds of public comment in response to its Proposed Rule and Interim Final Rule, the FDIC issued a Final Rule.⁹⁵⁵ Section 380.27 of the FDIC's Final Rule lays down standards that control the amounts and timing of financial recoveries paid to creditors of systemically important financial institutions that fail and undergo special resolution administered by the FDIC.⁹⁵⁶

Loss absorption on the part of creditors and shareholders operates on three principles generally tracking standard bankruptcy priority rules: First, long-term unsecured senior debt (defined as maturing more than 360 days after issuance),⁹⁵⁷ subordinated debt,⁹⁵⁸ and shareholders⁹⁵⁹ receive no preferential treatment relative to other general creditors of a systemically important financial institution. The FDIC has no discretion to make preferential "additional payments" to these debt and equity holders beyond what would be recovered through the application of normal priority rules to their claims.⁹⁶⁰ In its Interim Final Rule, the FDIC clarified that "the authority to make additional payments...will *never* be used to provide additional payments...to shareholders, subordinated debt holders, and bondholders [and] that

⁹⁵⁴ See Comm. on Capital Mkts. Reg. Comment Letter to the Fin. Stability Oversight Council Advance Notice of Proposed Rulemaking regarding Authority to Require Supervision and Regulation of Certain Nonbank Financial Companies, 75 Fed. Reg. 61,653, Nov. 5, 2010.

⁹⁵⁵ 76 Fed. Reg. 41,626 (July 15, 2011) (to be codified at 12 C.F.R. Part 380) [hereinafter "Final Rule"].

⁹⁵⁶ *Id.* § 380.27(b).

⁹⁵⁷ *Id.* § 380.27(b)(1).

⁹⁵⁸ *Id.* § 380.27(b)(2).

⁹⁵⁹ *Id.* § 380.27(b)(3).

⁹⁶⁰ *Id.* §§ 380.27(b) (1)-(4).

these creditors...will *never* meet the statutory criteria for receiving such additional payments.”⁹⁶¹ Second, shorter-term debt (debt maturing within 360 days of issuance) is eligible on a case-by-case basis to receive “additional payments” at the FDIC’s discretion if such payments “meet all of the [statutory] requirements,”⁹⁶² including Dodd-Frank’s requirement that the FDIC maximize going-concern value and minimize resolution costs.⁹⁶³ These payments would be an effective carve-out from normal priority rules such as are embodied in chapter 11 of the U.S. Bankruptcy Code⁹⁶⁴ and the FDIC’s statutory resolution procedure.⁹⁶⁵ The decision to award exempted status to short-term debt is made by the FDIC Board of Directors and is non-delegable.⁹⁶⁶ Third, any preferential additional payment made to short-term debt holders (or any other creditor or shareholder class) that is deemed to be unnecessary to preserve the “essential” operations of the issuer is subject to claw-back under § 210(o)(1)(D) of Dodd-Frank.⁹⁶⁷ The FDIC has predicted that additional payments “to any creditor will be very rare” and that it is “highly unlikely that payments to short-term lenders would be found to qualify for...exemption” from claw-back. According to the FDIC, preferential treatment will instead strictly be limited, reserved in most cases to payments to critical vendors and trade creditors, such as “software or hardware [vendors]...or payments to a utility with a local monopoly,”⁹⁶⁸ rather than to short-term instrument holders. The effect of the Rule, therefore, is to negate any federal guarantee of short-term financial creditors of systemically important financial institutions.

The FDIC approach does not solve the problem of contagion. By denying almost all financial protection for short-term creditors, the Rule will not prevent runs on failing institutions, nor does it distinguish between systemically important short-term liabilities and long-term capital. The whole Dodd-Frank regime, which prohibits providing capital support in most situations, in fact may contribute to contagion because it has removed the possibility for open

⁹⁶¹ Notice of Interim Final Rule Implementing Certain Orderly Liquidation Authority Provisions of the Dodd-Frank Wall Street Reform and Consumer Protection Act, 76 Fed. Reg. 4207 (Jan. 25, 2011) (to be codified at 12 C.F.R. Part 380), <http://www.gpo.gov/fdsys/pkg/FR-2011-01-25/pdf/2011-1379.pdf> (emphasis added).

⁹⁶² Final Rule, *supra* note 955, § 380.27(b)(4).

⁹⁶³ Dodd-Frank Act §§ 210(b)(4), (d)(4), (h)(5)(E).

⁹⁶⁴ *See generally* 11 U.S.C. §§ 506, 507, 1129 (2006).

⁹⁶⁵ 12 U.S.C. § 1821(d)(11).

⁹⁶⁶ Proposed Rule § 380.27(b)(4); Interim Rule § 380.2(b)(4).

⁹⁶⁷ Dodd-Frank Act § 210(o)(1)(D).

⁹⁶⁸ Interim Rule, *supra* note 961, at 4212.

bank assistance that was previously available. Creditors will know that, in all likelihood, they cannot escape unharmed.

d. Money Market Mutual Fund Reform

Solutions to the specific concern of MMMF contagion may be warranted due to the importance of MMMFs in providing short-term funding to the banking system.⁹⁶⁹ As discussed in Parts I.B.5 and II.A.4, since prime MMMF assets mainly consist of the short-term liabilities of large global banks, the resulting liability interconnectedness heightens the importance of stemming MMMF contagion. However, when evaluating the effectiveness of various MMMF regulatory proposals, it is important to keep in mind that from a systemic risk perspective the need for a safe MMMF industry is a result of its importance in funding the banking system. In that respect, regulations that combat MMMF contagion, but that consequently push systemically important banks to seek short-term funding from alternative, less-regulated sources, will not have served the purpose of reducing systemic risk. While the MMMF industry may be safer, the financial system as whole would be no less vulnerable to contagion in that case.

The following proposals for MMMF reform are considered: (i) redemption restrictions on MMMFs, which would limit rapid MMMF creditor outflows in times of stress, (ii) enhanced liquidity requirements, (iii) a floating NAV requirement, and (iv) MMMF capital requirements.

i. Redemption Restrictions for MMMFs

The limitations on short-term funding suggested above are not a potential solution to the contagion risk faced by money market funds, as these funds by their very nature invest in short-term instruments. Due to the critical role played by MMMFs, money market fund reforms have been the subject of extensive public debate. SEC Chairman Schapiro has recently advocated for redemption restrictions on money market fund investments. Specifically, she has proposed a 30-day holdback of 3% of an investor's holdings.⁹⁷⁰ It is thought that a fee or an outright redemption restriction would improve the liquidity position of MMMFs by reducing MMMF investors' incentives to flee, as they did when RPF broke the buck in September 2008.

⁹⁶⁹ See Scharfstein, *supra* note 419. *But see also* INV. CO. INST, *supra* note 423.

⁹⁷⁰ Mary L. Schapiro, Chairman, Sec. & Exch. Comm'n, Statement on Money Market Fund Reform (Aug. 22, 2012), <http://www.sec.gov/news/press/2012/2012-166.htm>.

Though the SEC has not yet issued a proposed rule or offered a detailed plan for redemption restrictions, BlackRock, a major player in the MMMF industry, has provided a rough outline of the anticipated redemption restriction model.⁹⁷¹ Each MMMF investor would be subject to a minimum account balance, calculated daily, which would be some percentage (e.g., 3%) of the investor's prior 30-day average balance.⁹⁷² The investor would be required to wait for some period, likely 30 days, to withdraw this restricted balance. Critical to the effort to combat runs, a portion of the investor's restricted minimum would be subordinated, and therefore subject to first-loss treatment if the MMMF were forced to break the buck.⁹⁷³ The portion of the restricted minimum that would be subordinated would be proportionate to the current balance divided by the prior 30-day average.⁹⁷⁴ In other words, the investors that choose to run will be subordinated—up to 3% of their 30-day average—by the proportion of the funds that they withdraw, while those that do not run will not suffer any subordination, though they will remain subject to the minimum account balance.⁹⁷⁵

Industry participants have vocally opposed redemption restrictions, claiming that investors will not use MMMFs with these characteristics. In a March 2012 comment letter to the SEC, Fidelity Investments contended that the SEC's proposed reforms will “ultimately destroy the money market fund industry.”⁹⁷⁶ According to a poll conducted by consultant Treasury Strategies, 90% of current MMMF users would either decrease or stop use of MMMFs if a redemption holdback provision were enacted.⁹⁷⁷ BlackRock cites client concerns, noting that 43% of its customers dipped below their 30-day average balance during 2011, and 10% did so regularly.⁹⁷⁸ Though these industry concerns do not directly relate to redemption restrictions' ability to combat contagion, they should be seriously considered because less attractive MMMFs

⁹⁷¹ *Money Markey Funds: The Debate Continues*, BLACKROCK (Mar. 2012), https://www2.blackrock.com/webcore/litService/search/getDocument.seam?venue=PUB_IND&source=GLOBAL&contentId=1111160117.

⁹⁷² *Id.* at 3.

⁹⁷³ *Id.*

⁹⁷⁴ *Id.*

⁹⁷⁵ *Id.*

⁹⁷⁶ Fidelity Invs. comment letter to the Sec. & Exch. Comm'n regarding File No. 4-619, Mar. 1, 2012; Release No. IC-29497 President's Working Group Report on Money Market Fund Reform 2 (Mar. 1, 2012), <http://www.sec.gov/comments/4-619/4619-125.pdf>.

⁹⁷⁷ Treasury Strategies, *Money Market Fund Regulations: The Voice of the Treasurer* 18 (April 18, 2012), http://www.ici.org/pdf/rpt_12_tsi_voice_treasurer.pdf.

⁹⁷⁸ BLACKROCK, *supra* note 971, at 4.

may drive investors elsewhere, for instance to banks or less regulated financial institutions, and may cause significant disruption to the broader economy.

Redemption restrictions also may not have their intended impact on financial contagion; rather, these restrictions may actually *increase* the likelihood of runs on MMMFs. BlackRock’s client research revealed that, if a portion of balances is held back for 30 days and subordinated, MMMF investors would redeem even sooner, “at the slightest sign of nervousness in the markets.”⁹⁷⁹ According to BlackRock, the complexity of the redemption restriction model is a significant disadvantage in a crisis:

[W]e believe clients would not take the time to navigate the complex structure and would be more likely to redeem earlier—and in this model, 97% of balances are open for redemption. Rather than preventing runs, we believe this approach would act to accelerate a run.⁹⁸⁰

In other words, a 3% redemption restriction is still only a buffer. To the extent that contagion is driven by fears of previously unrecognized exposure to toxic assets and uncertainty of other investors’ behavior, a small, inevitably arbitrary minimum balance will function much like capital requirements, providing a first line of defense but nonetheless failing to stem the outflow of short-term credit.

BlackRock has proposed an alternative system of “stand-by redemption gates” that would be triggered automatically when, for example, a fund’s liquidity drops below a specified level or its marked-to-market NAV drops below a certain value.⁹⁸¹ BlackRock does not specify the particular restrictions that would be imposed when these triggers are met, but does note that the only way to truly stop a run is to close off all redemptions in a crisis situation.⁹⁸² Though BlackRock contends that its proposal is less susceptible to runs than the SEC’s redemption restriction approach, it also risks encouraging run-like behavior. As a fund approaches a pre-specified “gate,” investors will choose to redeem en masse in order to avoid the impending redemption restrictions (which may include a restriction of all redemptions). Indeed, prior to the adoption of federally insured deposits, withdrawal suspensions were commonly used to combat

⁹⁷⁹ *Id.*

⁹⁸⁰ *Id.*

⁹⁸¹ *Id.*

⁹⁸² *Id.* at 4-5.

bank runs in the United States.⁹⁸³ While these suspensions were a response to fleeing depositors, they were also a cause of depositor flight. If past experience suggests that a bank or a bank regulator will limit withdrawals or redemptions, rational market participants will almost certainly attempt to withdraw their funds prior to their suspension, accelerating the run. While redemption restrictions on bank deposits, in the form of historical bank holidays, were somewhat successful during the Great Depression, they were also accompanied by deposit insurance, which likely achieved more in terms of reassuring depositors. Redemption restrictions on MMMF investors may have difficulty in stemming contagious runs if enacted in isolation.

ii. Enhanced Liquidity Requirements

In February 2010, the SEC amended Rule 2a-7 to significantly increase the liquidity of MMMFs. The SEC reduced the maximum permitted weighted average portfolio maturity of MMMFs from 90 days to 60 days. Additionally, MMMFs have to invest at least 10% of their portfolios in “daily liquid assets” (cash, U.S. government securities, and other securities that provide the holder the right to demand payment within one day) and 30% of their portfolio in weekly liquid assets (same as above, U.S. government securities maturing in 60 days or less, and other securities maturing within five business days). The final rule also prohibits MMMFs from investing more than 5% of the fund’s assets in illiquid securities. An illiquid security is any security that cannot be sold by the fund within seven days at approximately the value ascribed to it by the fund.⁹⁸⁴ According to a recent study by James Angel, due to the 2010 amendments a MMMF can withstand redemptions of 10% of its assets in a single day or 30% of its assets in a week without having to “sell a single asset into a fragile market.”⁹⁸⁵ The 2010 amendments also adopted Rule 22(e)(3), which permits a MMMF’s Board of Directors to suspend redemptions when liquidating a fund.

The Investment Company Institute (ICI) has advanced a proposal involving a “private emergency liquidity facility,” which would be capitalized through contributions from prime

⁹⁸³ See, e.g., William L. Silber, *Why Did FDR’s Bank Holiday Succeed?* FRBNY ECON. POLICY REV. 19, 21-23, July 2009, <http://www.newyorkfed.org/research/epr/09v15n1/0907silb.pdf>.

⁹⁸⁴ Money Market Funds, 17 C.F.R. § 270.2a-7 (2010).

⁹⁸⁵ JAMES J. ANGEL, CTR. FOR CAPITAL MKT. COMPETITIVENESS, MONEY MARKET MUTUAL FUND “REFORM”: THE DANGERS OF ACTING NOW 8 (2012), <http://www.centerforcapitalmarkets.com/wp-content/uploads/2010/04/Angel-Costs-and-Costs-of-MMMF-Reforms-draft-6.18.2012-FINAL.pdf>.

MMMF sponsors and structured as a state bank with access to the Federal Reserve discount window. All prime MMMFs would be required to participate and to make ongoing contributions. Importantly, the facility is not available to a MMMF if the fund invests in a security that defaults. Thus, the facility is not expected by the ICI to increase moral hazard in the sense that if a MMMF invests in a high-risk security it suffers the consequences if that security defaults. The facility would only be available during times of reduced liquidity to purchase securities from MMMFs, enabling funds to respond to redemption requests without selling assets at distressed prices.⁹⁸⁶

The main alternative to the above proposals that is available to policymakers today is the use of emergency liquidity facilities, as discussed in more detail below, provided by the central bank to fund solvent financial institutions (i.e., those with adequate collateral) in a crisis.⁹⁸⁷ Broadening institutional access to Federal Reserve liquidity facilities formed a major pillar of the federal response to the financial crisis; however these lending facilities have been significantly altered by Dodd-Frank, which drastically cut back the scope of the Federal Reserve's authority and strengthened collateral requirements for emergency lending, while prohibiting lending to individual non-bank financial institutions. Given that MMMFs are non-bank financial institutions falling under this prohibition, the Federal Reserve could alternatively channel liquidity through banks. In this manner, the MMMF would use its assets to secure a loan from a bank, which in turn would use that collateral to borrow from the Fed. For banks to be willing to play such a role, particularly during times of crisis when the market for the MMMF assets may be illiquid, banks would likely require assurance from the Federal Reserve as to the quality of the collateral before lending to the MMMF.

Regardless of a direct or indirect channeling of liquidity, since it is always possible that a severe surge in demand for immediate liquidity by short-term investors could exceed an institution's high quality assets available for sale or result in a prolonged freeze-up of funding markets, recourse to liquidity provided by a central bank would likely be necessary in the future.

⁹⁸⁶ Inv. Co. Inst. comment letter to the Sec. & Exch. Comm'n regarding the President's Working Group Report on Money Market Fund Reform Options (File No. 4-619), at 49, Jan. 10, 2011, http://ici.org/pdf/11_sec_pwg_com.pdf.

⁹⁸⁷ For a discussion of the Dodd-Frank Act's impact on the availability of emergency liquidity facilities, see discussion *infra* Part II.B.2.a.

Providing access to central bank liquidity might be more efficient than relying on private institutional liquidity buffers if the access abolished risk to short-term creditors. But it might also introduce inefficiencies to the regulation of financial institutions because it would position a public source as the final backstop against institutional losses, weakening the imposition of losses on creditors.

iii. Floating NAV Requirement

Another proposed solution to reduce the risk of a run in prime money market funds is to require MMMFs to float their NAV. This would require MMMFs to use mark-to-market pricing of portfolio securities rather than amortized cost accounting for the purpose of determining the NAV of fund shares on a daily basis. The SEC has traditionally deemed amortized cost accounting as more appropriate for MMMFs for several reasons. First, MMMFs tend to hold securities to maturity, unlike other mutual funds, which regularly buy and sell their portfolio securities. Second, MMMF portfolio securities are high-quality, very short-term, fixed-income securities so they rarely fluctuate in value. Third, there is not an active market for such securities, so mark-to-market accounting would involve a great deal of subjectivity and complicate comparisons between MMMFs.

Most importantly, requiring MMMFs to use mark-to-market accounting to float their NAV would not address the risk of sudden, large redemption requests. MMMFs would still provide the same degree of maturity and liquidity transformation. A floating NAV does not reduce the underlying risk of MMMF investments, including interest rate risk, credit risk and liquidity risk. MMMF investors will continue to need ready access to their cash and have a low tolerance for risk. During stress events, these risk-averse investors are still able to pull back quickly and are incentivized to do so. For example, according to the ICI, “French floating NAV dynamic money funds...lost about 40 percent of their assets over a three-month time span from July 2007 to September 2007.”⁹⁸⁸ Thus, a floating NAV does not address the risk of contagion among MMMF investors. It is true that under a fixed NAV, that overstates the true value of a fund, there is an incentive to withdraw early at par rather than to remain invested and suffer the

⁹⁸⁸ See INV. CO. INST., *supra* note 986, at 34.

actual losses. So if an investor can today withdraw for 100 when the true value is 98 he will do so. The floating NAV will mean the investor can only withdraw today for 98 but that will not stem withdrawals based on fears that the NAV will experience further declines, e.g., to 96.

iv. Capital Requirement for MMMFs

Further reforms currently being considered by the SEC include a requirement that MMMFs hold a small capital buffer, such as 1% of NAV, which would reduce the risk of a run on MMMFs.⁹⁸⁹ SEC Chairman Mary Schapiro has suggested in Congressional testimony that “[t]he capital buffer would not necessarily be big enough to absorb losses from all credit events. Instead, the buffer would absorb the relatively small mark-to-market losses that occur in a fund’s portfolio day to day, including when a fund is under stress.”⁹⁹⁰ In this manner, the capital buffer would not prevent substantial losses that would come with a major credit event and/or fire sale of assets, which could more than overwhelm a small capital buffer. To the extent that MMMF investors may run to avoid such large losses, the capital buffer would not seem to solve the problem of contagion.

2. Protection of Short-Term Creditors Through Lender of Last Resort and Guarantees

Ex ante capital and liquidity requirements and ex post resolution procedures are designed around a common regulatory purpose: imposing losses on debt and equity holders so that public support for the financial system at no time becomes necessary. Capital, liquidity, and resolution are also commonly regarded as providing mutually reinforcing buttresses against systemic risk. Capital and liquidity aim toward minimizing the rate of failure in the financial system; resolution toward minimizing disruption to the financial system that is caused by failures that capital and liquidity are unable to prevent. Deploying them in conjunction should arguably reduce both the frequency and the severity of failure, which in turn should lower the risk of contagion in the financial system. This is the basis of the strategic vision for protecting the financial system from

⁹⁸⁹ *U.S. SEC Considers Capital Buffer for Money Funds*, WALL ST. J., July 10, 2012, <http://online.wsj.com/article/BT-CO-20120710-714832.html>.

⁹⁹⁰ Mary L. Schapiro, Chairman, Sec. & Exch. Comm’n, Testimony Before the Comm. on Banking, Housing & Urban Affairs of the U.S. Senate: Perspectives on Money Market Mutual Fund Reforms (June 21, 2012), <http://sec.gov/news/testimony/2012/ts062112mls.htm>.

contagion animating the catalogue of approaches outlined in Part II.B.1, which we have found insufficient in many respects.

The recurrent criticism raised in Parts II.A and II.B.1 is that using capital, liquidity, and resolution to *cushion* short-term creditors against losses is an inadequate deterrent, since they will always prefer to exercise their contractual right to redeem at par over the possibility, however minimal, that the combined protections conferred by *ex ante* and *ex post* cushions might fail to insulate their investments perfectly.

There is only one structural mechanism that will effectively prevent investors from withdrawing funding from the financial system prior to and during a contagious run: *maturity*. Equity and long-term debt holders cannot exit during a crisis unless it coincides with the maturing of their investments. Since maturity is fixed ahead of time, redemptions by long-term capital providers are unlikely to correlate with the occurrence of a financial crisis, so they present a minimal systemic risk. For obvious reasons, maturity cannot prevent runs by short-term debt holders (including bond holders with remaining short maturities), and short-term holders will always be a staple of a banking system offering demand deposits and payments, and further providing a transformative function of converting shorter maturity liabilities into loans. The only effective way, therefore, to protect short-term creditors is through public support, in the form of lender of last resort or public guarantees. In fact, both these techniques, which played such a prominent role in the crisis, have been severely curtailed by Dodd-Frank in the post-crisis anti-“bailout” environment.

a. Lender of Last Resort

The Federal Reserve acts as a lender-of-last-resort to banking institutions through the discount window.⁹⁹¹ Standard discount window loans from the Federal Reserve must be fully secured with acceptable collateral including government and agency securities, ABS, corporate bonds, money market instruments, and residential and commercial real estate loans, among other

⁹⁹¹ See Bd. of Governors of the Fed Reserve Sys., *The Federal Reserve Discount Window*, FEDERAL RESERVE DISCOUNT WINDOW, <http://www.frbdiscountwindow.org/discountwindowbook.cfm?hdrID=14&dtIID=43> (last visited Feb. 27, 2012).

eligible securities.⁹⁹² Unsecured discount window lending is not permitted, so institutions with no acceptable collateral cannot access it. Prior to the enactment of Dodd-Frank the Federal Reserve was also authorized to act as the lender of last resort to individual *non*-banks including “[i]ndividuals, [p]artnerships, and [c]orporations” in “unusual and exigent circumstances” by § 13(3) of the Federal Reserve Act.⁹⁹³ Combined with the discount window, § 13(3) enabled central bank liquidity to reach potentially the entire bank- and non-bank financial system (to the extent that borrowers could post collateral that the Federal Reserve deemed to be adequate). During the financial crisis of 2007-2009 the Federal Reserve exercised its § 13(3) liquidity power through the creation of a sweeping series of novel borrowing facilities, including the Term Auction Facility (TAF), Primary Dealer Credit Facility (PDCF), Term Securities Lending Facility (TSLF), Term Asset-Backed Securities Loan Facility (TALF), Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF), Commercial Paper Funding Facility (CPFF), and Money Market Investor Funding Facility (MMIFF). The role that these facilities played during the crisis is described in Part II.A.4. Section 13(3) also formed the statutory basis for the Federal Reserve assistance of selected individual non-bank financial institutions, including Bear Stearns and AIG.⁹⁹⁴

Before Dodd-Frank, the main predicates of emergency § 13(3) lending were a five-of-seven vote by the Federal Reserve Board members coupled with the inability of the recipient institution “to secure adequate credit accommodations from other banking institutions.”⁹⁹⁵ Funds were required to be “secured to the satisfaction of the Federal Reserve,”⁹⁹⁶ leaving the appraisal of the adequacy of collateral posted by recipients to the Board’s discretion. The Federal Reserve exercised its § 13(3) authority for the first time since 1936⁹⁹⁷ by giving discount window access to primary dealers through the PDCF program in the financial crisis.⁹⁹⁸

⁹⁹² *Id.*

⁹⁹³ Federal Reserve Act § 13(3)(A).

⁹⁹⁴ Press Release, Bd. of Governors of the Fed. Reserve Sys. (Mar. 16, 2008), *supra* note 601; Press Release, Bd. of Governors of the Fed. Reserve Sys. (Sept. 16, 2008), *supra* note 604.

⁹⁹⁵ Federal Reserve Act § 13(3)(A).

⁹⁹⁶ *Id.*

⁹⁹⁷ SCOTT & GELPERN, *supra* note 486, at 46.

⁹⁹⁸ See Press Release, Bd. of Governors of the Fed. Reserve Sys. (Mar. 16, 2008), *supra* note 601.

In contrast to these possibilities before Dodd-Frank, Section 1101 of Dodd-Frank drastically cuts back the scope of the Federal Reserve’s § 13(3) authority and strengthens collateral requirements for emergency lending. Dodd-Frank requires § 13(3) programs to be conducted on a market-wide basis⁹⁹⁹ only, prohibiting assistance to individual non-bank financial institutions undergoing runs or in danger of failing. All emergency lending is subject to “the prior approval of the Secretary of the Treasury”¹⁰⁰⁰ and is governed by policies agreed to by the Treasury ensuring that § 13(3) loans are adequately collateralized and are never extended to insolvent borrowers.¹⁰⁰¹ This effectively withdraws exclusive control over both the eligibility and appraisal of collateral posted to secure emergency loans from the Federal Reserve Board. It makes the availability of emergency lending to non-bank financial institutions more of a contingent matter reserved for the case-by-case judgment of the Treasury. Holders of short-term debt issued by failing financial institutions are extremely unlikely to accept the uncertainty inherent in an ad hoc lending regime that might be cancelled at any time or simply never initiated at all,¹⁰⁰² especially when the arbiter of the decision is the Secretary of the Treasury, a political actor. The risk that the Secretary will withhold lender of last resort assistance from a distressed financial institution at a critical moment prevents this assistance from serving its function as a guarantee, or even a near guarantee. More generally, carving out insolvent companies (who could be covered by Fed lending if the Fed were to judge the collateral adequate) from coverage of a central bank emergency lender regime is the functional opposite of a guarantee. It assures short-term creditors who are fearful of future insolvency that emergency funding will *not* be available to support them, which will increase, not decrease, the incentive for short-term creditors to run in anticipation of a future failure. Thus, the ability of the Federal Reserve to stem contagion has been decisively weakened. Indeed, these Dodd-Frank changes will amplify

⁹⁹⁹ Dodd-Frank Act § 1101(a)(2), (6) (requiring lending facilities to be structured with “broad-based eligibility” with “the purpose of providing liquidity to the financial *system*, and not to aid a failing financial *company*” and stating that a “program or facility that is structured to remove assets from the balance sheet of a *single and specific company*... shall not be considered a program or facility with broad-based eligibility”) (emphasis added).

¹⁰⁰⁰ *Id.* § 1101(a)(6) (“(B)...(iv) The Board may not establish any program or facility under this paragraph without the prior approval of the Secretary of the Treasury”).

¹⁰⁰¹ *Id.* § 1101(a)(6).

¹⁰⁰² Hal S. Scott, Testimony Before the Committee on Financial Services, U.S. House of Representatives, Jan. 26, 2011 (urging that the Treasury Secretary “may be reluctant to approve needed lending facilities for fear of political consequences”).

volatility and systemic risk in the future, since market expectations about the credibility of the public guarantee have been undermined and could be negated by policymakers at any time.

To serve as a complete guarantee, the central bank's lender of last resort powers would have to be unlimited and non-discretionary, indeed even broader than they were under the prior § 13(3). Chairman Bernanke has claimed that the Federal Reserve was unable to rescue Lehman because it could not post adequate collateral, and the collateral requirements have since been further tightened.¹⁰⁰³ On the other hand, it would be unwise to give the Federal Reserve unlimited lender of last resort powers. In the first place, access to emergency borrowing would continue to hinge on Federal Reserve decision-making (even if freed from Treasury approval in the §13(3) context). This would not be an ironclad guarantee under which short-term creditors would necessarily be willing to entrust their investments to firms whose liabilities could but might not be guaranteed by the Fed. Second, allowing unlimited unsecured lending by the Federal Reserve would further entail negative consequences for central bank independence and negative consequences for the financial system as a whole. Scott (2011) identifies risks to Federal Reserve independence presented by unsecured lending activity, including increasing the Federal Reserve's dependence on the Treasury by "jeopardizing [its] ability...to finance its own operations," "tarnishing its image and financial credibility in the event that [it] ends up with minimal or negative capital," and subjecting it to greater "political pressures."¹⁰⁰⁴ Endangering the autonomy of the Federal Reserve may not only interfere in its ability to provide liquidity in the future, it could also affect the independence of its core function, conducting monetary policy. Extending an unlimited line of credit to financial institutions could also result in a sizeable loss

¹⁰⁰³ Ben S. Bernanke, Chairman, Fed. Res. Bd., Speech at the Economic Club of New York (October 15, 2008), <http://www.federalreserve.gov/newsevents/speech/bernanke20081015a.htm> (stating that a "public-sector solution for Lehman proved infeasible, as the firm could not post sufficient collateral to provide reasonable assurance that a loan from the Federal Reserve would be repaid"); *Highlights: Bernanke's Testimony to Financial Crisis Panel*, REUTERS, Sept. 2, 2010, <http://www.reuters.com/article/idUSTRE6812ZH20100902> (reporting Bernanke's statement that "the only way we could have saved Lehman would have been by breaking the law and I'm not sure I'm willing to accept those consequences for the Federal Reserve and for our system of laws").

¹⁰⁰⁴ SCOTT & GELPERN, *supra* note 486, at 81-82; *see also* Kenneth N. Kuttner, *The Federal Reserve as Lender of Last Resort During the Panic of 2008* (prepared for the Comm. on Capital Mkts. Reg., Dec. 30, 2008), http://www.capmksreg.org/pdfs/The_Federal_Reserve_as_Lender_of_Last_Resort_during_the_Panic_of_2008.pdf (discussing the Federal Reserve's reliance on new issuance of Treasury securities under the Supplementary Financing Program to compensate for the Fed's lack of sufficient Treasury securities to conduct monetary policy, due to the substitution on its balance sheet of loans to banks for Treasury securities).

position to U.S. taxpayers,¹⁰⁰⁵ by decreasing the profits the Federal Reserve now contributes to the Treasury and the general revenue of the United States, amounting to \$75.4 billion in 2011¹⁰⁰⁶ (a 59% increase over 2009 contributions of \$47.4 billion).¹⁰⁰⁷ Since 2006, the Federal Reserve's balance sheet assets have more than tripled to \$2.9 trillion at the end of 2011,¹⁰⁰⁸ greatly expanding taxpayer exposure to losses on Federal Reserve holdings (but paradoxically leading to increased earnings when such losses are not forthcoming).

To protect taxpayers from internalizing the expenses associated with guaranteeing short-term debt holders, some method for recouping the public costs of Federal Reserve lending would need to be devised. But since by definition the recipients of unsecured public loans would be insolvent at the time, the effectiveness of this system would be limited unless funding could be sought from the remaining solvent financial institutions. This funding would have to be raised in the form of an assessment imposed on healthy financial institutions for the purpose of covering the public costs of a bailout.¹⁰⁰⁹ It could be imposed either before a crisis, similar to insurance premiums or unused line fees on lines of credit, or after a crisis. Both approaches to funding a guarantee were debated extensively during the formulation of the Dodd-Frank reforms.¹⁰¹⁰ At that time, the CCMR signaled its preference for an ex post assessment, raised after the actual "cleanup" costs of government intervention were known with precision, as well as the identities of the market participants that contributed the lion's share of systemic risk.¹⁰¹¹ Determining the appropriate method for funding the cost of a public guarantee structured in this format is a complex undertaking. The issue of funding of public support is also raised below with respect to insurance and the injection of public funds.

¹⁰⁰⁵ SCOTT & GELPERN, *supra* note 486, at 81.

¹⁰⁰⁶ BD. OF GOVERNORS OF THE FED. RESERVE SYS., 98TH ANNUAL REPORT, 2011, at 144 (2012), <http://www.federalreserve.gov/publications/annual-report/files/2011-annual-report.pdf>.

¹⁰⁰⁷ BD. OF GOVERNORS OF THE FED. RESERVE SYS., 97TH ANNUAL REPORT, 2010, at 130 (2011), <http://www.federalreserve.gov/publications/annual-report/files/2010-annual-report.pdf>.

¹⁰⁰⁸ BD. OF GOVERNORS OF THE FED. RESERVE SYS., THE FEDERAL RESERVE BANKS: COMBINED FINANCIAL STATEMENTS AS OF AND FOR THE YEARS ENDED DECEMBER 31, 2011 AND 2010 AND INDEPENDENT AUDITORS' REPORT (2011); *see also* Scott, *The Reduction of Systemic Risk in the United States Financial System*, *supra* note 1, at 720-21.

¹⁰⁰⁹ For a proposal on estimating a liquidity insurance premium, see Tiago Severo, "Measuring Systemic Liquidity Risk and the Cost of Liquidity Insurance," IMF Working Paper, July 2012.

¹⁰¹⁰ *See* Scott, *The Reduction of Systemic Risk in the United States Financial System*, *supra* note 1, at 715-17.

¹⁰¹¹ *Id.* at 716.

b. Liability Insurance and Guarantees

i. Introduction

Insurance for customer deposits administered by the FDIC has formed an integral element of depository banking regulation in the United States since 1934.¹⁰¹² Deposit insurance is credited with stabilizing the depository banking system after it collapsed in the early 1930s.¹⁰¹³ Nor has its application been confined to the United States: explicit deposit insurance is a recurring worldwide feature of modern banking regulation utilized in more than 88 countries (excluding countries that employ an “implicit” guarantee of bank deposits that is not formalized through the provision of a discrete insurance fund).¹⁰¹⁴ The economic efficiencies of deposit insurance have been documented by Diamond and Dybvig¹⁰¹⁵ and Carnell, Macey, and Miller (2009),¹⁰¹⁶ among others.

For deposit-taking banks, the role of liability insurer is filled by the FDIC, but only in the context of depository borrowing under a limit (currently \$250,000 for interest-bearing accounts) and never for non-bank financial institutions.¹⁰¹⁷ Although depository insurance is rightly regarded as a critical stabilizing attribute of financial regulation, innovation in financial technology over the past three decades and increasing intermediation in the modern financial system have now rendered the coverage it provides highly incomplete. This was proven most dramatically during the financial crisis. At the beginning of the crisis, short-term creditors of financial institutions assumed the existence of an implicit government guarantee of all short-term liabilities and appeared to be largely justified in doing so. The government’s assisted rescue of

¹⁰¹² CARNELL ET AL., *supra* note 475, at 309 (describing deposit insurance as the “defining policy issue in U.S. banking regulation”).

¹⁰¹³ *See, e.g.*, FRIEDMAN & SCHWARTZ, *supra* note 455, at 434-45 (describing deposit insurance as “the most important structural change in the banking system to result from the 1933 panic, and...the structural change most conducive to monetary stability”).

¹⁰¹⁴ *See* Asli Demirgüç-Kunt, Baybars Karacaovali & Luc Laeven, *Deposit Insurance Around the World: A Comprehensive Database* (World Bank, Apr. 2005), http://siteresources.worldbank.org/INTRES/Resources/DepositInsuranceDatabasePaper_DKL.pdf; *see also* SCOTT & GELPERN, *supra* note 486, at 316-18 (discussing deposit insurance in the European Union), 382-83 (discussing deposit insurance in Japan), 1148-49 (discussing the implicit deposit insurance regime in China).

¹⁰¹⁵ Diamond & Dybvig, *supra* note 493, at 413-16.

¹⁰¹⁶ CARNELL ET AL., *supra* note 475, at 309-11.

¹⁰¹⁷ Dodd-Frank Act § 335(a)(1). During the financial crisis, certain non-interest-bearing transaction accounts were subject to a temporary unlimited FDIC guarantee, which has since been extended until the end of 2012. Fed. Deposit Ins. Corp., Final Rule: Temporary Unlimited Coverage for Noninterest-Bearing Transaction Accounts, 12 C.F.R. § 330 (2010).

Bear Stearns in March 2008 in partnership with JPMorgan Chase and its subsequent effective nationalization of the Government Sponsored Enterprises (GSEs) Freddie Mac and Fannie Mae in July of the same year are likely to have reinforced belief among market participants (including short-term creditors) in the existence of an unlimited implied public guarantee of large U.S. financial institutions. But then by allowing Lehman Brothers to fail in September 2008, the government was seen as canceling or at least weakening the guarantee. According to this interpretation, the anti-bailout signal transmitted by the failure of Lehman, not the failure itself, triggered the spread of contagion effects in markets for short-term institutional borrowing by withdrawing protection that market participants had assumed they would receive.

Dissenting from the primary conclusions of the FCIC's Financial Crisis Inquiry Report, Peter Wallison articulated an account of the chain of events, including the government's role, preceding the failure of Lehman Brothers that strongly supports this interpretation:

[I]nvestors and other market participants reasonably believed after the rescue of Bear [Stearns] that all large financial institutions would also be rescued if they encountered financial difficulties. However, when Lehman Brothers—an investment bank even larger than Bear—was allowed to fail, market participants were shocked; suddenly, they were forced to consider the financial health of their counterparties... This caused a halt to lending and a hoarding of cash—a virtually unprecedented period of market paralysis and panic that we know as the financial crisis of 2008.¹⁰¹⁸

Wallison's conclusion draws important support from the fact that the contagion effects initiated by Lehman began to subside only after the government days later rescued AIG and then took the unprecedented step of adopting multiple *explicit* guarantees including the U.S. Treasury's guarantee of MMMFs and the FDIC's TLGP program for unlimited deposit insurance on certain transaction accounts and unsecured senior bank debt. Remedial steps taken before these measures, including the Federal Reserve's sponsorship of multiple emergency liquidity facilities and the historic conversion of Goldman Sachs and Morgan Stanley to bank holding

¹⁰¹⁸ FCIC REPORT, *supra* note 26, at 445.

companies with discount window access,¹⁰¹⁹ proved incapable of independently negating the contagion that was unleashed by Lehman (*see* Figure 2.5 above). Instead only an explicit return to what was perceived as the status quo ante through the announcement of unlimited public guarantees restored order in the rapidly disintegrating financial system.

Based on this experience, what may be needed is a more complete public guarantee of short-term non-deposit financial liabilities, whether held by banks or non-bank financial institutions. In its October 2010 report, discussed in Part II.B.1, the IMF endorsed an insurance premium to fund “systemic liquidity risk.”¹⁰²⁰ That report identified a series of related proposals by Gorton and Metrick (2009),¹⁰²¹ Brunnermeier and others (2009),¹⁰²² Perotti and Suarez (2009),¹⁰²³ and several others outlining different shapes that liquidity insurance might take.¹⁰²⁴ All of these proposals share a common recognition of the systemic vulnerability to runs linked with wholesale short-term financing of bank and non-bank credit intermediaries, the demonstrated historical success of an insurance system in the depository banking context, and the prospective value of such a system for internalizing the costs created by (while formalizing a guarantee of) modern wholesale short-term finance.

Such a system of universal insurance for short-term financial liabilities would assure short-term creditors automatic protection through assessments on issuers,¹⁰²⁵ removing the element of uncertainty tied to discretionary emergency lending or politically contingent (and unpopular) bailouts. The costs of supplying a public guarantee could be internalized through the use of insurance premiums or through some other form of assessment, either before or after they are triggered. Operational responsibility for a public insurance fund could be assigned to a

¹⁰¹⁹ DealBook, *As Goldman and Morgan Shift, a Wall St. Era Ends*, N.Y. TIMES, Sept. 21, 2008, <http://dealbook.nytimes.com/2008/09/21/goldman-morgan-to-become-bank-holding-companies/>. While Goldman and Morgan had received access to the Federal Reserve’s emergency facilities in the preceding months, their conversions to bank holding companies were widely viewed as efforts to eliminate future liquidity and funding uncertainty linked to regulators’ planned discontinuation of emergency facility access in January 2009.

¹⁰²⁰ *See, e.g.*, Int’l Monetary Fund, *Sovereigns, Funding, and Systemic Liquidity* 57 (Oct. 2010).

¹⁰²¹ Gorton & Metrick, *supra* note 516.

¹⁰²² Markus Brunnermeier et al., *The Fundamental Principles of Financial Regulation, Geneva Reports on the World Economy* (Geneva, Int’l Ctr. for Monetary and Banking Studies, 2009), <http://www.princeton.edu/~markus/research/papers/Geneva11.pdf>.

¹⁰²³ Enrico Perotti & Javier Suarez, *Liquidity Insurance for Systemic Crises*, 31 POL’Y INSIGHT (Ctr. for Econ. Pol’y Research, Feb. 2009), <http://www.cepr.org/pubs/policyinsights/PolicyInsight31.pdf>.

¹⁰²⁴ *See also* Ricks, *supra* note 492.

¹⁰²⁵ Such a fund could be raised either ex ante or ex post. *See infra* Part II.B.2.b.iii.

separate government agency (for example, the FDIC) that is free from conflicting institutional mandates like those constraining the Federal Reserve. Of course, the economic cost of short-term liability insurance arises from the same moral hazard problem created in all insurance regimes (or bailouts as discussed later in this paper): insured creditors, like any policyholders protected from loss, have little incentive to monitor risk-taking by issuers.¹⁰²⁶ The economic cost of moral hazard can in theory be internalized by optimizing the premiums extracted from policyholders, but it is unknown whether the pricing of insurance on short-term liabilities could be perfected, a matter explored below.

However, the reforms in the wake of the financial crisis have made a system of short-term liability guarantees appear less, rather than more, feasible. Under Dodd-Frank, future FDIC guarantees like the Transaction Account Guarantee Program and the Temporary Liquidity Guarantee Program used during the financial crisis of 2007-2009 will require approval through a joint resolution of Congress before they can be implemented.¹⁰²⁷ In addition, the TARP legislation eliminated the Treasury's ability to use economic stabilization funds to guarantee MMMFs.¹⁰²⁸ Together, these limitations threaten to delay seriously, and in the worst case scenario may block entirely, the FDIC and Treasury's ability to act as a guarantor during a contagious panic. Thus, neither the Federal Reserve nor the FDIC, acting in the current scope of their powers, is capable of providing an adequate public guarantee that will protect the financial system from generalized contagion in the future. Ultimately, neither fills the dimensions of what is truly needed: a comprehensive framework for the containment of systemic risk.

(1) The Current Regime for U.S. Deposit Insurance

To understand how a system of ironclad insurance might be applied to non-deposit financial liabilities in the U.S., it is instructive to consider the various elements of the existing U.S. deposit insurance systems as a point of departure. The importance of U.S. federal deposit insurance and its role in stemming the crippling banking panics during the early 1930s is well documented.¹⁰²⁹ Under the Banking Act of 1933, depositors in federally insured institutions

¹⁰²⁶ CARNELL ET AL., *supra* note 475, at 326-28; SCOTT & GELPERN, *supra* note 486, at 210.

¹⁰²⁷ Dodd-Frank Act § 1105(d).

¹⁰²⁸ See 12 U.S.C. § 5236(b) (2006).

¹⁰²⁹ See *generally* Jenkins, *supra* at 114; FRIEDMAN & SCHWARTZ, *supra* note 455, at 434-45.

receive a government guarantee (deposit insurance) for up to a maximum coverage amount.¹⁰³⁰ As currently structured, U.S. Federal Deposit Insurance insures two types of accounts. Deposits in interest-bearing deposit accounts of up to \$250,000 are fully insured (this coverage ceiling had formerly been \$100,000, but was increased during the financial crisis).¹⁰³¹ Deposits in non-interest-bearing transaction accounts (for which a bank does not require advance notice of intended withdrawal) has been extended without a dollar limit through the end of 2012, after which point all deposits (interest- and non-interest bearing) will be insured up to the \$250,000 limit.¹⁰³² Covered banks are charged insurance premiums that are paid into the Deposit Insurance Fund (DIF) managed by the FDIC.¹⁰³³ In the event of a bank failure, the FDIC makes depositors whole (up to the statutory limit) by either opening an account for depositors at a healthy bank (in the amount of their insured deposits), or by paying depositors their insured deposit amounts.¹⁰³⁴

Historically, the DIF has had the ability to pay dividends to its contributors when the DIF Reserve Ratio (the ratio of reserves to total insured deposits in the system) exceeded 1.5%.¹⁰³⁵ The FDIC's 2011 final rulemaking implementing Dodd-Frank, however, has restricted this ability—dividends have been suspended indefinitely, though bank assessment rates are now reduced whenever the DIF Reserve Ratio is above 2.0%.

Evaluated in light of the principles above, the FDIC has performed well in terms of forestalling bank panics (arguably its primary aim) over the last 75 years,¹⁰³⁶ and few banks have complained that FDIC premiums have pro-cyclically caused them to fail. However, its record on effectively internalizing the costs of bank failures is decidedly mixed. At the end of the savings and loan crisis in the late 1980s, for example, the FDIC Bank Insurance Fund was insolvent by

¹⁰³⁰ CARNELL ET AL., *supra* note 475, at 314-15.

¹⁰³¹ Dodd-Frank Act § 335(a)(1).

¹⁰³² Fed. Deposit Ins. Corp., Final Rule: Temporary Unlimited Coverage for Noninterest - Bearing Transaction Accounts (Nov. 9, 2010).

¹⁰³³ Fed. Deposit Ins. Corp., *The Deposit Insurance Fund*, <http://www.fdic.gov/deposit/insurance/> (last visited Sept. 20, 2012). The Deposit Insurance Fund was formed in 2006 when the Federal Deposit Insurance Reform Act of 2005 was signed into law. This act combined the previously existing Bank Insurance Fund with the Saving Association Insurance Fund. Federal Deposit Insurance Reform Act of 2005, Pub. L. No. 109-173, 119 Stat. 3601. A more detailed description of the FDIC's insurance pricing methodology is provided below. *See infra* Part II.B.2.b.iii(1)(a).

¹⁰³⁴ CARNELL ET AL., *supra* note 475, at 315.

¹⁰³⁵ Federal Deposit Insurance Reform Act § 2105(a).

¹⁰³⁶ Morgan Ricks, *Regulating Money Creation After the Crisis*, 1 HARV. BUS. L. REV. 75, 119 (2011).

\$7 billion, with 1,000 commercial banks lingering on the FDIC's problem bank list.¹⁰³⁷

Similarly, in the wake of the 2007-2009 financial crisis, the DIF declined to a low point of negative \$20.9 billion at the end of 2009. However, due primarily to assessment income and a decline in anticipated bank failures, the DIF has since steadily increased to \$11.8 billion.¹⁰³⁸

Going forward, while the FDIC must hew to the principle of not assessing such high premiums that it meaningfully increases the likelihood that banks fail, it may need to do a better job of covering its expected losses through insurance premiums collected.¹⁰³⁹

ii. Types of Liabilities and Institutions to Insure

(1) General Principles

An initial question for the design of an insurance program is what liabilities will be covered. As Paul Krugman put it: “Now the problem is regulating shadow banking—non-depository banking. So right from the beginning we have the problem of deciding what is a bank, and what liabilities need deposit-type guarantees. All short-term debt? Only some kinds of repo? Who do we need to be worried about?”¹⁰⁴⁰ Others reject this instrument-focused question as “ill-specified” because in attempting to price insurance, it is impossible to separate the asset side of a firm's balance sheet from the liability side.¹⁰⁴¹ In other words, the cost to the government of providing an ex ante-funded liability guarantee (which should be reflected in the price that covered institutions pay for the guarantee) is a function of the riskiness of the assets that covered

¹⁰³⁷ FED. DEPOSIT INS. CORP., A BRIEF HISTORY OF DEPOSIT INSURANCE IN THE UNITED STATES 53 (1998). The losses incurred by the FDIC's BIF represented a relatively small fraction of the total losses incurred during the thrift crisis, most of which were funded directly by Congress or borne by the thrift industry.

¹⁰³⁸ Memorandum from Arthur Murton, Dir., Fed. Deposit Ins. Corp. Div. of Ins. & Research to the Bd. of Dir. of Fed. Deposit Ins. Corp. 3 (Apr. 3, 2012), https://www.fdic.gov/deposit/insurance/memo_2012_04_03.pdf.

¹⁰³⁹ One might expect that this was the purpose of the 2011 Final Rulemaking. However, as former FDIC Chairman Sheila Bair noted at the announcement of the final rule, the new system of assessments “should keep the overall amount collected from the industry very close to unchanged, although the amounts that individual institutions pay will be different.” Press Release, Fed. Deposit Ins. Corp., FDIC Approves Final Rule of Assessments, Dividends, Assessment Base and Large Bank Pricing (Feb. 7, 2011). This suggests that the FDIC may face aggregate solvency issues in the future as well.

¹⁰⁴⁰ Paul Krugman, *Idiot-Proofing Financial Regulation*, N.Y. TIMES BLOG (Mar. 29, 2010).

¹⁰⁴¹ Ricks, *supra* note 492, at 43.

firms use those liabilities to fund.¹⁰⁴² From this perspective, in determining the optimal scope of insurance coverage, the first question is necessarily which institutions to insure, not which types of liabilities to insure (in isolation).

One can imagine different possible ways of determining which institutions to insure.¹⁰⁴³ However, because the goal of the insurance program is to guard against the consequences of the failure of firms that pose systemic risk, perhaps the most straightforward approach to coverage would be to extend the guarantee to the short-term liabilities of firms that pose such risks. As the Committee has discussed before,¹⁰⁴⁴ and as has been indicated by the ongoing debate about the criteria used to designate non-bank financial institutions as systemically important,¹⁰⁴⁵ this designation is fraught with potential complications and distortions. The Committee has in the past supported the use of asset thresholds rather than qualitative designations of systemic importance, because asset thresholds are more likely to avoid signaling that certain banks will be saved and the possible competitive advantages that might be conferred upon institutions that receive such a designation.¹⁰⁴⁶ In this sense, too, an institution's inclusion in the insurance program may signal an implicit branding of "systemic importance" that will bring about the same complications and distortions discussed above. Therefore, as is the case with non-bank SIFI-designation, asset thresholds (while not entirely unproblematic) are the most objective way to designate which institutions should receive insurance coverage. The \$50 billion asset threshold, set in Dodd-Frank for systemically important banks and in FSOC's final rules for non-bank

¹⁰⁴² For an intuitive explanation of why this is the case, consider the following: would you charge more to guarantee the commercial paper (CP) of an institution that used CP to fund purchases of U.S. Treasury notes, or an institution that used CP to fund subprime adjustable-rate HELOC loans? For a formal theoretical presentation, see Robert C. Merton, *An Analytic Derivation of the Cost of Deposit Insurance and Loan Guarantees: An Application of Modern Option Pricing Theory*, 1 J. BANKING & FIN. 3 (1977).

¹⁰⁴³ In one of the more well-developed proposals, Morgan Ricks discusses requiring all firms engaging in maturity transformation to purchase insurance that would guarantee short-term liabilities. Ricks, *supra* note 492, at 35-43. While the simplicity of this approach is appealing, defining which institutions are actually engaging in maturity transformation would present meaningful technical challenges upon implementation.

¹⁰⁴⁴ See, e.g., Comm. on Capital Mkts. Reg., Letter to Christopher Dodd, Chairman, S. Comm. on Banking, Housing & Urban Affairs 5 (June 14, 2010); Comm. on Capital Mkts. Reg., Letter to Christopher Dodd, Chairman, and Richard Shelby, Ranking Member, S. Comm. on Banking, Housing & Urban Affairs (May 4, 2010); Comm. on Capital Mkts. Regulation, Letter to Lance Auer, Fin. Stability Oversight Council (Dec. 19, 2011).

¹⁰⁴⁵ See, e.g., Arthur D. Postal, *FSOC Promises Details on Nonbank Systemically-Important Criteria*, PROPERTY CASUALTY 360 DEGREES (Aug. 11, 2011; 1:55 PM), <http://www.propertycasualty360.com/2011/08/11/fsoc-promises-details-on-nonbank-systemically-imp>.

¹⁰⁴⁶ Comm. on Capital Mkts. Reg., Letter to Christopher Dodd, Chairman, S. Comm. on Banking, Housing & Urban Affairs 5 (June 14, 2010).

SIFIs,¹⁰⁴⁷ may be a good starting point for determining which financial institutions to include in the insurance program. However, this should be subject to further analysis and discussion before implementation. In particular, since the chosen asset threshold would apply to non-bank financial institutions (e.g., money market mutual funds, hedge funds, etc.), it would be particularly important to consider thresholds that are appropriate for these different firms.

In addition to establishing an asset threshold, FSOC also considers factors such as (i) interconnectedness, (ii) substitutability, (iii) leverage, (iv) liquidity risk and maturity mismatch, and (v) existence of a regulatory authority in determining the designation non-bank financial firms as systemically important.¹⁰⁴⁸ Similarly, the FSB has adopted an indicator-based measurement approach which considers (i) size, (ii) interconnectedness, (iii) existence of substitute institutions, (iv) nature of activity, and (v) level of complexity in designating a financial institution as systemically important.¹⁰⁴⁹ These factors potentially provide further guidance for inclusion in an insurance program, although any subjective measures run counter to the arguments made above for an objective asset threshold.

Along with determining which institutions to include, there is also a need to specify which of these institutions' liabilities to cover. As discussed throughout this paper, contagious run behavior is most problematic with short-term debt. Therefore, this determination becomes a question of where to draw the line along the maturity spectrum between debt that is sufficiently short-term to be subject to risky run behavior and longer-term debt that does not pose similar types of systemic contagion risk. While a specific determination of where to draw such a line is beyond the scope of the present analysis, the end result would be a requirement that firms above the asset threshold purchase insurance for all debt with maturity below a given term.

¹⁰⁴⁷ See Authority to Require Supervision and Regulation of Certain Nonbank Financial Companies, 77 Fed. Reg. 21,637 (Apr. 11, 2012) (to be codified at 12 C.F.R. pt. 1310).

¹⁰⁴⁸ *Id.*

¹⁰⁴⁹ See BASEL COMM. ON BANKING SUPERVISION, GLOBAL SYSTEMICALLY IMPORTANT BANKS: ASSESSMENT METHODOLOGY AND THE ADDITIONAL LOSS ABSORBENCY REQUIREMENT (Nov. 2011), <http://www.bis.org/publ/bcbs207.pdf>.

(a) Special Issues for Insuring Money Market Mutual Funds

As discussed in Part II.A.4, money market mutual funds (MMMFs) are of particular concern given both the vulnerability of MMMFs to contagious runs (due to the money-like nature of MMMF's liabilities) and the danger they pose in amplifying systemic risk concerns as a result of their liability interconnectedness with other financial institutions. Totalling \$2.5 trillion in liabilities in the first quarter of 2012¹⁰⁵⁰ compared to bank liabilities of \$11.2 trillion,¹⁰⁵¹ MMMFs are the major buyers of short-term capital markets instruments including ABCP and secured repo, primarily those issued by global banks.¹⁰⁵² As such, they may be the best candidates for insurance, since they (1) absorb many of the short-term liability claims created by financial institutions and intermediaries in the financial system, (2) issue demand-like claims that are redeemable at par, and (3) employ a fixed \$1.00 NAV standard that transforms MMMF instruments (which are linked to long-term investment) from mutual fund investments into deposit-equivalent investments.¹⁰⁵³

These three features of the MMMF business model have arguably reinforced expectation among some market participants in an implicit guarantee of MMMF investments.¹⁰⁵⁴ However, recent surveys of MMMF investors strongly suggest that a substantial majority of retail and institutional MMMF investors are aware that the values of MMMF assets fluctuate and that MMMF investments are not guaranteed by the government. Only 10% of retail investors surveyed by Fidelity believe the government would step in to prevent a MMMF from “breaking the buck.”¹⁰⁵⁵ While the above suggests MMMF investors do not necessarily have an expectation of government support, sponsor support did play a role in containing runs during the financial crisis. In the week following Lehman's collapse, the strength of a fund's implicit sponsor

¹⁰⁵⁰ BD. OF GOVERNORS OF THE FED. RESERVE SYS., FLOW OF FUNDS ACCOUNTS OF THE UNITED STATES 84 (June 7, 2012), <http://www.federalreserve.gov/releases/z1/20120607>.

¹⁰⁵¹ BD. OF GOVERNORS OF THE FED. RESERVE SYS., ASSETS AND LIABILITIES OF COMMERCIAL BANKS IN THE UNITED STATES (WEEKLY) - H.8, at 5, (July 6, 2012), <http://www.federalreserve.gov/releases/h8/current/20120706>.

¹⁰⁵² See Scharfstein, *supra* note 419.

¹⁰⁵³ William A. Birdthistle, *Breaking Bucks in Money Market Funds*, 2010 WIS. L. REV. 1155, 1160-61 (describing the stable NAV “pricing scheme...combined with check-writing and ATM privileges [makes] money market funds look and feel a great deal more like bank savings accounts than the mutual funds they are”); Ricks, *supra* note 492, at 4.

¹⁰⁵⁴ Wermers, *supra* note 529, at 1.

¹⁰⁵⁵ FMR LLC, *The Investor's Perspective: What Individual Investors Know About the Risks of Money Market Mutual Funds* (Apr. 2012), <http://www.sec.gov/comments/4-619/4619-170.pdf>.

guarantee, as measured by the size of the sponsor's equity, had a positive impact in reducing the amount of redemptions the fund faced.¹⁰⁵⁶ This finding further highlights the potential for either insurance or guarantees to combat contagion in the MMMF industry.

The centrality of MMMFs to modern financial intermediation and the powerful influence that investor confidence in the integrity of MMMF investments exerts on the stability of financial markets was displayed during the financial crisis of 2007-2009, when serious runs on MMMFs impaired the orderly operation of the commercial paper markets and propelled contagious knock-on runs up the chain of intermediation. Analysis by Birdthistle (2010) of SEC rules introduced *following* the crisis to regulate the composition of MMMF investment portfolios concludes that such runs will remain problematic in the future.¹⁰⁵⁷ Birdthistle suggests that, alongside other reforms, MMMF insurance organized privately or publicly would help to offset this risk.¹⁰⁵⁸ Private insurance might be impractical, however, because, owing to contagion, loss-causing events are unlikely to be small, isolated occurrences that insurers can comfortably manage. Instead, in the event that one fund breaks the buck, contagion-induced outflows might cause countless other funds to do so, leading to losses that are too large for insurers to bear.¹⁰⁵⁹ Given the potentially extreme losses that private insurers could face, some kind of public insurance may be a more feasible option, possibly in combination with private insurance.

Since MMMFs absorb large portions of other short-term liability claims created to finance origination activity in the financial system, insuring MMMF investments may be the narrowest way for regulators to reduce the spread of contagion up the chain of intermediation during a financial crisis. If investors in MMMFs know their shares are guaranteed to \$1.00, they are not likely to rush to exit during a panic. This will reduce pressure on MMMFs to engage in fire sales of commercial paper and repo securities for the purpose of fulfilling redemption requests from exiting investors, thus helping to prevent a downward spiral in asset prices that

¹⁰⁵⁶ See Kacperczyk, Marcin & Philipp Schnabl, *Implicit Guarantees and Risk Taking: Evidence from Money Market Fund*, (Nat'l Bureau of Econ. Research, Working Paper No. 17321, Aug. 2011).

¹⁰⁵⁷ Birdthistle, *supra* note 1053, at 1180-89; *see also* Money Market Fund Reform Proposed Rule, 74 Fed. Reg. 32,688 (to be codified at 17 C.F.R. Parts 270, 274).

¹⁰⁵⁸ Birdthistle, *supra* note 1053, at 1197-99.

¹⁰⁵⁹ *See* Inv. Co. Inst., *supra* note 986 (noting that "[w]ithout a federal backstop, private insurance companies would consider unlimited guarantees on money market funds' NAVs uninsurable because of the possibility of contagion").

could cripple the short-term capital markets and render other financial institutions that are reliant on them unable to roll over their short-term liabilities.

However, there are serious countervailing arguments against such an approach. For example, the ICI contends that the size and complexity of contemporary MMMF portfolios would make a comprehensive insurance system impracticable, drive outflows from depository banking, and create moral hazard.¹⁰⁶⁰ In the ICI's view, providing federal insurance to MMMF investments would siphon cash from traditional bank deposits, causing "disintermediation [and] significant disruption to the banking system."¹⁰⁶¹ Capping the guarantee, as in the depository insurance context, would leave room for runs by investors with uninsured exposures in excess of the cap.¹⁰⁶² On the other hand, exempting MMMFs from explicit insurance, as they are today, may encourage investors to shift short-term funding from deposits into MMMFs because those investments will continue to benefit from an implied public guarantee (as we saw in the crisis) without internalizing its costs. Ultimately, since the guarantee of depository and MMMF investments would be equivalent, there should be no artificial incentive for investors to shift funding from one instrument to the other. In its October 2010 report on MMMF reform, the President's Working Group on Financial Markets (PWG) considered insurance as a possible reform option, noting several critical issues that would need to be addressed.¹⁰⁶³ The PWG report focuses on moral hazard concerns, the dramatic expansion of the role of regulators with limited bandwidth, and insurance pricing difficulties.¹⁰⁶⁴

Considering the issues raised above regarding pure private or pure public insurance, another potential option for MMMF insurance is a hybrid system that combines private insurance with a public backstop. This approach, also discussed by the ICI, could entail three levels of loss absorption.¹⁰⁶⁵ For example, the MMMF would be responsible for losses on the first 0.5% of fund assets, while a private insurer covers the next 2.5%. The public backstop would kick in after losses exceed 3% of fund assets, hence limiting government exposure to extremely adverse

¹⁰⁶⁰ *Id.* at 46-50.

¹⁰⁶¹ *Id.* at 47.

¹⁰⁶² *Id.* at 47-48.

¹⁰⁶³ PRESIDENT'S WORKING GROUP ON FINANCIAL MARKETS, MONEY MARKET FUND REFORM OPTIONS 26-28 (Oct. 2010).

¹⁰⁶⁴ *Id.* at 28.

¹⁰⁶⁵ *See* Inv. Co. Inst., *supra* note 1059.

losses and capping potential losses to private insurers. Such a system of government support would resemble the federal backstop created by the Terrorism Risk Insurance Act (“TRIA”), which provides public reinsurance coverage to insurance companies facing claims related to declared acts of terrorism. While private insurance companies may have concern about heightened federal regulation (insurance companies are primarily state regulated) under such a hybrid system, the TRIA model suggests additional regulatory burdens may not be a necessary component. TRIA explicitly preserves the jurisdiction and regulatory authority of the States with only minor exceptions.¹⁰⁶⁶ While an original version of the bill in the House of Representatives included a provision to impose increased capital requirements through tax deductions, ultimately this provision was removed from the final TRIA legislation.¹⁰⁶⁷ However, despite the potential for a hybrid system modeled after TRIA, insurance companies may not have the capacity or desire to allocate sufficient capital for the private portion, even with the capped exposure.¹⁰⁶⁸

Another strand of criticism urges that insurance of MMMFs would present traditional depository banking institutions with burdensome competition. Since MMMF portfolios contain generally high-quality, liquid, readily marketable securities, insurance premiums charged to MMMF institutions would presumably be lower than the rates applied to conventional banks, which often transform deposits into longer-term, illiquid, and thus riskier loans. Insured MMMF instruments would then pass through a portion of this cost advantage to investors in the form of higher yields relative to traditional deposits, encouraging customers to migrate out from depository banking institutions into lower-cost (but equally secure) MMMF shares. This could decrease bank lending in favor of more direct finance through the markets in which the money market funds invest. Indeed, the PWG notes, “Limits on insurance coverage (perhaps similar to those for deposit insurance) would be needed to avoid giving MMFs an advantage over banks.”¹⁰⁶⁹

Despite the potential competitive advantage that liability insurance might confer upon the money market industry, many in the industry continue to oppose it, believing that it would

¹⁰⁶⁶ See Terrorism Risk Insurance Act of 2002, H.R. 3210, 107th Cong. § 106 (2002).

¹⁰⁶⁷ *Id.* § 11 (as reported by the House, Nov. 19, 2001).

¹⁰⁶⁸ See *id.*

¹⁰⁶⁹ *Id.* However, the PWG does acknowledge that an insurance cap would “do little to reduce their incentive to run should MMF risks become salient.” *Id.*

represent the first step toward full capital-based regulation of the money market funds.¹⁰⁷⁰ It is hard to see, however, why capital regulation would necessarily follow from insurance. Money market funds will not become insolvent like banks—their assets are more liquid and less risky—and thus do not really require capital. At most, liabilities may not be worth par. The purpose of insurance for MMMFs is only to prevent runs not to insure solvency.

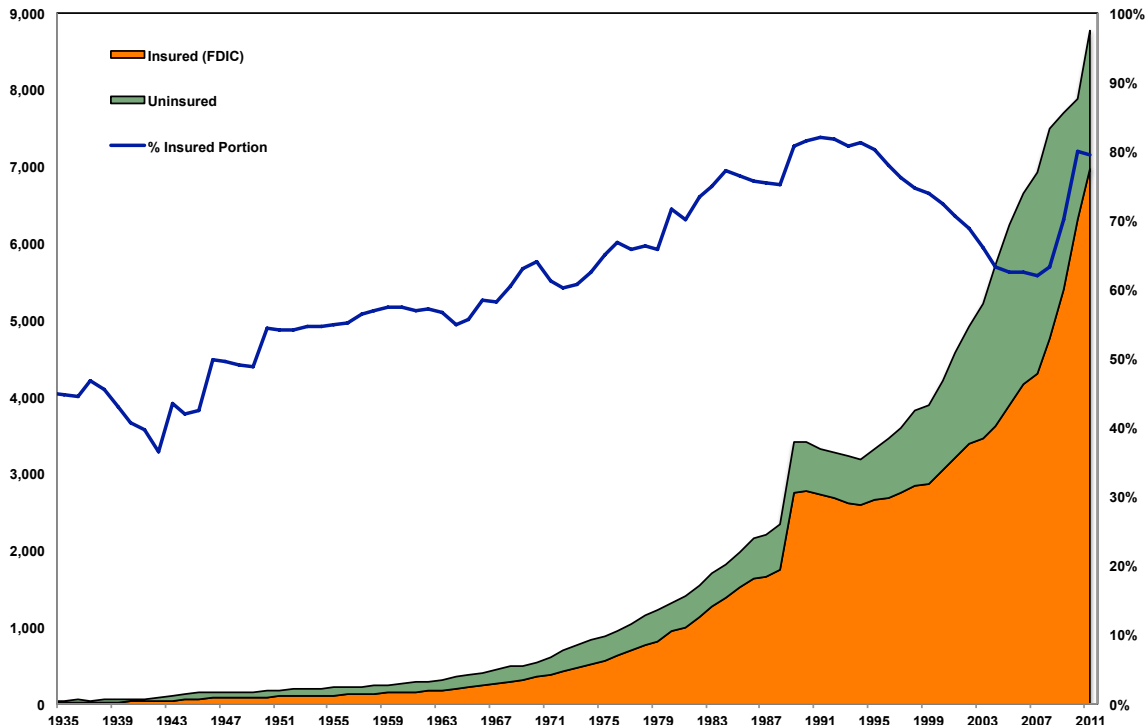
The true competitive impact of expanded insurance on the banking and money market industries requires more detailed study of the appropriate cost and pricing of insurance, before any firm conclusions can be drawn.

(2) Amount of Insurance Coverage

A very challenging question is what caps, if any, to apply to guarantees of covered liabilities. Standard bank deposits have long been subject to explicit caps on FDIC coverage. Under this approach, customers with more than the maximum insured amount deposited in a single account could be motivated to police risk-taking activity by their bank, but in practice it is not clear that many do. Rather, analysts and ratings agencies keep a check on riskiness because their evaluations can increase the cost of funds for banks.

¹⁰⁷⁰ Edward C. Johnson III & F. William McNabb III, *Your Money Market Funds Are Safe*, WALL ST. J., May 16, 2011, <http://online.wsj.com/article/SB10001424052748703730804576317531107173162.html>.

Figure 2.12: Insured (FDIC) and Uninsured Domestic Deposits – 1934 to Present¹⁰⁷¹
\$ billions



In total, the FDIC insured approximately \$7 trillion of domestic deposits at the end of 2011, accounting for 80% of all domestic deposits outstanding in the U.S. financial system.¹⁰⁷² Since its inception, the ratio of insured-to-total domestic deposits that are backed by the FDIC has fluctuated, but generally increased gradually, from 45% in 1934 (\$18 billion of \$40 billion total) to as much 82% in 1991 (\$2.7 trillion of \$3.3 trillion total) (*see* Figure 2.12).¹⁰⁷³ While it fell to as low as 60% before the crisis, it is now back to 80%. The reasons for the rise are unclear—it may be the result of the continuing insurance for unlimited transaction accounts (due to run out at the end of the year) and new precautions by depositors to make sure they hold insured funds, e.g., through multiple insured accounts.

¹⁰⁷¹ FED. DEPOSIT INS. CORP., 2011 ANNUAL REPORT 130-32 (2012), <https://www.fdic.gov/about/strategic/report/2011annualreport/AR11final.pdf>.

¹⁰⁷² *Id.* at 130.

¹⁰⁷³ *Id.* at 130-132.

Figure 2.13: Deposit and Non-Deposit U.S. Financial System Liabilities – 1950 to Present¹⁰⁷⁴
\$ billions

Year	1950	1960	1970	1980	1990	2000	2007	2008	2009	2010	2011
MMMF shares	\$ -	\$ -	\$ -	\$ 76	\$ 493	\$ 1,812	\$ 3,033	\$ 3,757	\$ 3,258	\$ 2,755	\$ 2,643
Open market paper	1	7	40	164	610	1,614	1,789	1,599	1,137	1,057	969
Federal funds and repos	(1)	(2)	1	103	336	1,001	2,119	1,238	1,488	1,272	1,141
Securites loaned, net	-	-	-	1	71	508	1,240	887	857	733	658
Short-term (est.)	0	4	41	345	1,511	4,935	8,180	7,482	6,741	5,818	5,411
GSE liabilities	3	11	45	190	468	1,923	3,081	3,390	2,977	6,589	6,378
Agency/GSE backed pools	0	0	5	114	1,020	2,493	4,464	4,961	5,377	1,139	1,305
ABS issuer liabilities	-	-	-	-	269	1,504	4,534	4,123	3,308	2,278	2,019
Non-deposit liabilities	\$ 3	\$ 16	\$ 91	\$ 649	\$ 3,268	\$ 10,855	\$ 20,260	\$ 19,956	\$ 18,403	\$ 15,825	\$ 15,113
Comparison: Domestic bank deposits											
Insured	\$ 91	\$ 150	\$ 350	\$ 949	\$ 2,785	\$ 3,055	\$ 4,292	\$ 4,751	\$ 5,408	\$ 6,315	\$ 6,979
Uninsured	76	111	196	376	631	1,157	2,629	2,755	2,298	1,572	1,800
Total deposits	\$ 168	\$ 260	\$ 545	\$ 1,324	\$ 3,415	\$ 4,212	\$ 6,922	\$ 7,505	\$ 7,705	\$ 7,888	\$ 8,779
% insured	54.4%	57.5%	64.1%	71.6%	81.5%	72.5%	62.0%	63.3%	70.2%	80.1%	79.5%
Memo:Cap (000s)	\$ 10	\$ 10	\$ 10	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 250	\$ 250	\$ 250
Estimated uninsured short-term liabilities											
Non-deposit uninsured	\$ 0	\$ 4	\$ 41	\$ 345	\$ 1,511	\$ 4,935	\$ 8,180	\$ 7,482	\$ 6,741	\$ 5,818	\$ 5,411
Deposit uninsured	76	111	196	376	631	1,157	2,629	2,755	2,298	1,572	1,800
Total uninsured	\$ 77	\$ 115	\$ 236	\$ 720	\$ 2,141	\$ 6,092	\$ 10,810	\$ 10,236	\$ 9,039	\$ 7,391	\$ 7,211
% total short-term	45.6%	43.5%	40.4%	43.2%	43.5%	66.6%	71.6%	68.3%	62.6%	53.9%	50.8%

By comparison with deposits (\$7 trillion, 80% insured), according to flow-of-funds data published by the Federal Reserve, as of December 31, 2011, there were \$2.6 trillion of shares issued by MMMFs, \$1.0 trillion of commercial paper, \$1.1 trillion of repos outstanding in the financial system, as well as \$658 billion of net securities loaned (\$5.4 trillion in total).¹⁰⁷⁵ In addition, there was a further \$9.7 trillion in longer-term GSE, agency-backed, and ABS issuer securities outstanding at the end of the same period.¹⁰⁷⁶ Cumulatively, non-deposit financial liabilities totaled nearly \$15 trillion at the end of 2011, representing a reduction of 25% from their peak level in 2007 of greater than \$20 trillion (but still greater than total deposits)—all uninsured.¹⁰⁷⁷ An estimated \$5.4 trillion of these were short-term in duration, compared with only \$1.8 trillion of uninsured deposits (*see* historical evolution in Figure 2.13).¹⁰⁷⁸ As can be

¹⁰⁷⁴ BD. OF GOVERNORS OF THE FED. RESERVE SYS., FLOW OF FUNDS ACCOUNTS OF THE UNITED STATES, <http://www.federalreserve.gov/releases/z1/>. The tabulation is based on the convention in Pozsar et al., *supra* note 514, at 5 n.4 (defining “shadow bank liabilities” as sum of MMMF shares outstanding [line 13, L.121], open market paper [line 1, L.208], federal funds and repo liabilities [line 1, L.207], net securities loaned [line 20, L.130], GSE liabilities [line 21, L.124], agency- and GSE-backed pool securities [line 6, L.125], and ABS issuer liabilities [line 11, L.126]).

¹⁰⁷⁵ *Id.*

¹⁰⁷⁶ *Id.*

¹⁰⁷⁷ *Id.*

¹⁰⁷⁸ *Id.*

seen from Figure 2.13, as non-deposit bank liabilities have increased dramatically since the 1970s, uninsured short-term liabilities in the financial system have too. At the end of 2011, an estimated 51% of all short-term financial liabilities, including deposits outstanding, were uninsured.¹⁰⁷⁹ This places in perspective the sharp difference between the insurance coverage of the deposit and non-deposit segments of the financial system: although about 70% of banks' short-term liabilities are insured by the FDIC,¹⁰⁸⁰ only 49% of *all* short-term liabilities are—roughly equivalent to the percent of deposits that were insured in the early 1940s.¹⁰⁸¹ While less-than-total insurance coverage of short-term bank liabilities has been sufficient to prevent traditional bank runs since the establishment of the FDIC—presumably because of some combination of the Federal Reserve's lender-of-last-resort power and implicit government guarantee of bailouts—the experience with MMMFs during the financial crisis underscored the contagion risk associated with the much lower proportion of insured non-bank short-term liabilities.

Figure 2.14: Deposit and Non-Deposit Liability Insurance – Illustrative Incremental Loss Exposure¹⁰⁸²
\$ billions

	Loan exposure	
	\$ Amount	% Current
Current loss exposure - FDIC insured deposits	\$ 6,979	100%
Add: Uninsured portion of deposits	1,800	+26%
Subtotal - Pro forma insured deposits	8,779	126%
Add: MMMF shares outstanding	2,643	+38%
Subtotal - Pro forma insured deposits + MMMF shares	11,422	164%
Add: Open market/commercial paper	969	+14%
Add: Federal funds and repos	1,141	+16%
Add: Securities loaned, net	658	+9%
Memo: MMMF shares, commercial paper, fed funds, securities loaned	5,411	--
Total - Pro forma insured deposits + non-deposit short term liabilities	\$ 14,190	203%
Memo: Add GSE liabilities, agency/GSE backed pools, ABS issuer liabilities	9,702	139%
Total	23,892	342%

The second, closely related, concern associated with the creation of unlimited insurance for non-deposit financial liabilities is the enormous prospective increase in potential loss

¹⁰⁷⁹ The calculation of short-term non-deposit liabilities is an estimate determined by summing the MMMF shares outstanding, open market paper, federal funds and repo liabilities, and securities loaned amounts reported in the Federal Reserve's flow of funds data. *See id.*

¹⁰⁸⁰ This estimate is based on data provided by the FDIC.

¹⁰⁸¹ FED. DEPOSIT INS. CORP., 2011 ANNUAL REPORT, *supra* note 1071, at 130-32; *Statistics on Banking*, *supra* note 836.

¹⁰⁸² BD. OF GOVERNORS OF THE FED. RESERVE SYS., FLOW OF FUNDS ACCOUNTS OF THE UNITED STATES, *supra* note 1074.

exposure to the public of operating such a system. As noted above, the FDIC is presently the insurer of \$7 trillion of domestic bank deposits. Expanding coverage to all non-deposit liabilities could lead to an increase in total public exposure of slightly over 100% (*see* Figure 2.14).

Second, granting an unlimited guarantee to non-deposit liabilities in all likelihood will require a coequal increase in the coverage of deposit liabilities since otherwise uninsured depositors will just systematically withdraw uncovered funding from bank accounts and redeposit them in non-deposit instruments such as MMMFs that are subject to the unlimited guarantee. Thus, choosing to insure all non-deposit liabilities means that coverage also must simultaneously be extended to all currently *uninsured* deposit liabilities, representing an additional \$1.8 trillion at year-end 2011.

Doubling the government's potential loss exposure to the financial system is a significant increase over an already sizeable public commitment. It also may be economically unwarranted. At least in the depository context the risk assumed through removing the insurance cap might, for example, outweigh the marginal gains in systemic stability if regulators set the cap high enough to embrace a critical mass of small creditors who are fully insured and thus deterred completely from initiating a run that then forces larger creditors with real loss exposures to exit out of necessity. This is a reflection of the fact, appreciated by Friedman and Schwartz, that liability insurance "tends to reduce the contingency insured against" by reducing the probability of runs and thus the necessity of having to make pay-outs from the insurance fund.¹⁰⁸³

But on the other hand, though MMMFs and other short-term capital markets instruments arguably represent deposit equivalents to their investors, there may not be any equivalent of the "small depositor" in these settings, which are dominated by institutional or corporate investors managing amounts of capital many times exceeding the average small retail bank account.¹⁰⁸⁴ As of July 3, 2012 of the \$2.5 trillion in MMMF assets, \$887 billion are held by retail investors and \$1.64 trillion are held by institutional investors.¹⁰⁸⁵ It may prove impossible, if this is true, to establish insurance caps that are low enough to reduce the public's loss exposure to a reasonable

¹⁰⁸³ FRIEDMAN & SCHWARTZ, *supra* note 455, at 440.

¹⁰⁸⁴ *See generally* Pozsar et al., *supra* note 514, at 1.

¹⁰⁸⁵ Inv. Co. Inst., *Money Market Mutual Fund Assets* (Sept. 20, 2012), http://www.ici.org/research/stats/mmf/mm_09_20_12.

level while simultaneously sweeping in a critical mass of investors who will be completely protected and thus deterred from running during a crisis. Institutional investors will be much more prone to run than retail ones. Furthermore, the chosen level of the insurance cap must be adjusted to comparable levels of deposit guarantees to address the previously mentioned concern of regulatory-driven outflows from banks to money market funds. Indeed, banks have recently experienced a surge in non-interest-bearing deposits because these transaction accounts are guaranteed by the FDIC in unlimited amounts until the end of 2012, unlike interest-bearing deposits, which are subject to a \$250,000 cap.¹⁰⁸⁶ But when the FDIC's unlimited guarantee terminates at the end of 2012, non-interest-bearing deposits might dramatically contract, potentially forcing banks to cut their balance sheets in a manner that hurts real economic growth.¹⁰⁸⁷

One mitigating consideration regarding the prospective cost and risk of non-deposit liability insurance is whether issuers of *all* classes of short-term capital markets debt instruments, including MMMF shares, commercial paper, and repo securities, have to be subject to equivalent protections. MMMFs, as Part II.A.4 established, are the dominant buyers of commercial paper and repo in the financial system, so that insuring *only* MMMF investments might be sufficient to deter runs that, absent insurance, would provoke mass liquidations of MMMF holdings, including commercial paper and repo, created earlier in the chain of intermediation. Guaranteeing only MMMFs shares, plus the incremental uninsured portion of deposits, would still represent a doubling of current insured risk exposure, but would be considerably more modest than insuring all short-term non-deposit liabilities.

Another challenge is achieving international participation. This is important in order to prevent short-term creditors from transferring funding out of financial institutions in risky and non-guaranteed jurisdictions into safer insured institutions in jurisdictions with public guarantees during a financial crisis. Without coordination, uneven implementation of insurance will exert a destabilizing effect on non-guaranteed institutions as investor funds flow elsewhere or into risk-free instruments backed by the government. This danger is illustrated by the effect on deposit

¹⁰⁸⁶ See David Reilly, *Hot Money Could Make Banks Sweat*, WALL ST. J., Dec. 5, 2011, <http://online.wsj.com/article/SB10001424052970204397704577074813458717838.html>.

¹⁰⁸⁷ See *id.*

flows of the Irish government's public guarantee of all deposits and debt instruments at six major Irish financial institutions, including Allied Irish Banks, Bank of Ireland, and Anglo Irish Bank in September 2008.¹⁰⁸⁸ The Irish guarantee caused deposit outflows from banking institutions elsewhere in Europe, including the United Kingdom, into Ireland as investors sought to shield themselves from rising credit risk.¹⁰⁸⁹ One straightforward response to this problem is to coordinate to exclude creditors who transfer into a jurisdiction during a crisis from the protection of that jurisdiction's insurance. This would deter outflows seeking to take advantage of a more favorable insurance regime located elsewhere in a moment of panic. But such coordination would be difficult to achieve. And even countries that agreed to such a system might have an incentive to "cheat" and allow foreign inflows during a crisis by issuing large guarantees in order to encourage an influx. In the financial crisis of 2007-2009, the U.S. Treasury and FDIC limited foreign access to its stabilization programs to some extent (*see* Figure 2.15): foreign subsidiaries and branches were ineligible for the Capital Purchase Program, and foreign branches also were restricted from accessing the FDIC's TLGP debt guarantee. Other Treasury and FDIC protections, including the PPIF, Transaction Account Guarantee, and various Federal Reserve facilities including the TALF and CPFF were, however, made available to foreign subsidiaries and branches.

¹⁰⁸⁸ Dept. of Fin., *supra* note 907 (declaring "a guarantee arrangement to safeguard all deposits (retail, commercial, institutional and interbank), covered bonds, senior debt and dated subordinated debt (lower tier II), with...Allied Irish Bank, Bank of Ireland, Anglo Irish Bank, Irish Life and Permanent, Irish Nationwide Building Society and the Educational Building Society"); John Murray-Brown & Neil Dennis, *Ireland Guarantees Six Banks' Deposits*, FIN. TIMES, Sept. 30, 2008, <http://www.ft.com/cms/s/0/2124f8f4-8eb9-11dd-946c-0000779fd18c.html3#axzz1FB0Hf2nT>.

¹⁰⁸⁹ Gonzalo Vina & Caroline Binham, *Brown Lifts Deposit Guarantee as Cash Goes to Ireland*, BLOOMBERG, Oct. 3, 2008, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=ax7rcN0fhh5Q>.

Figure 2.15: Eligibility of Branches and Subsidiaries of Foreign Banks in Selected U.S. Stabilization Programs

Program	Program Management	Foreign Eligibility Subsidiaries?	Foreign Eligibility Branches?	Foreign Asset Screening?
Capital Purchase Program (CPP) ¹⁰⁹⁰	Treasury	No	No	n/a
Legacy Securities Program (PPIP) ¹⁰⁹¹	Treasury	Yes	Yes	Yes
Term Asset-Backed Securities Loan Facility (TALF) ¹⁰⁹²	Fed	Yes	Yes (must hold Fed reserves)	Yes
Commercial Paper Funding Facility (CPFF) ¹⁰⁹³	Fed	Yes	Yes	Yes
TLGP Debt Guarantee Program ¹⁰⁹⁴	FDIC	Yes	No	No
TLGP Transaction Account Guarantee Program ¹⁰⁹⁵	FDIC	Yes	Yes (only grandfathered)	n/a
Depository Insurance Increase to \$250,000 ¹⁰⁹⁶	FDIC	Yes	Yes (only grandfathered)	n/a
Asset Guarantee Program (AGP) for Citigroup ¹⁰⁹⁷	Treasury	n/a	n/a	Yes

iii. Insurance Pricing

As discussed above, one core principle of a non-deposit liability insurance system is that covered institutions should internalize their costs by making payments to the insurance provider (the government and/or private sector) that reflect the cost of providing the guarantee. However, there are several different timing mechanisms by which these insurance fees may be collected; specifically, institutions could pay for coverage before, during, or after the guarantee is used. This section considers the pricing implications for each of these timing options.

¹⁰⁹⁰ See *Investment Programs*, *supra* note 606.

¹⁰⁹¹ Master Agreement among Citigroup Inc. et al. (Jan. 15, 2009), http://www.treasury.gov/initiatives/financial-stability/programs/investment-programs/agp/Documents/Citigroup_01152009.pdf.

¹⁰⁹² See *Term Asset-Backed Securities Loan Facility: Frequently Asked Questions*, *supra* note 603.

¹⁰⁹³ See Press Release, Bd. of Governors of the Fed. Reserve Sys. (Oct. 7, 2008), *supra* note 597.

¹⁰⁹⁴ See *Temporary Liquidity Guarantee Program*, *supra* note 605.

¹⁰⁹⁵ *Id.*

¹⁰⁹⁶ 12 C.F.R. pt. 330.

¹⁰⁹⁷ Press Release, U.S. Dep't of the Treasury, Treasury Dep't Releases Details on Public Private Partnership Investment Program (Mar. 23, 2009), <http://www.treasury.gov/press-center/press-releases/Pages/tg65.aspx>.

(1) Ex Ante Option

Under a system funded ex ante, covered institutions would pay a periodic risk-based fee, or insurance premium, in exchange for receiving non-deposit short-term liability insurance. As discussed, the main reason for this approach is that it would provide a private fund from which insurance payments could be made, when necessary, thus avoiding public expenditures.¹⁰⁹⁸ Recurring and risk-based fees would help to mitigate the moral hazard that could arise from guaranteed liabilities. By pricing insurance to reflect the risk of covered institutions' activities, regulators can incentivize institutions to behave in a prudent manner on an ongoing basis. Other ways of addressing moral hazard created by insurance are taken up in a subsequent section; here, the focus is on developing a methodology for pricing insurance that fairly covers the government's cost of providing the guarantee.

(a) Looking to History: The FDIC Approach for Bank Insurance

While some of the challenges of pricing insurance for non-depository liabilities are new, many of these issues have been addressed for decades in the analogous case of pricing FDIC deposit insurance. Examining how FDIC insurance is priced is therefore an instructive place to begin the analysis.

When the Banking Act of 1933 established the FDIC, insured institutions were covered for \$2,500 for each depositor (a limit that was subsequently raised) and paid premiums as a fixed percentage of insurable deposits.¹⁰⁹⁹ While the basic assessment rates were adjusted over the initial years of the FDIC, under the permanent system, rates settled out at 1/12th of 1 percent (8.33 basis points) of total deposits below the insurance ceiling, some portion of which was credited back to covered banks if the insurance fund's anticipated losses were covered beyond a

¹⁰⁹⁸ The premise that the government should price insurance to cover its expected losses deserves emphasis, since it separates the Committee proposal from several of the other proposals mentioned above. *See supra* Part II.B.2.b.i. Specifically, it differs from the Perotti/Suarez and Acharya approaches by focusing on covering expected losses to the insurance fund, rather than on using price as a mechanism for optimally deterring behavior that contributes to systemic risk. In this regard it also departs from the approaches to pricing insurance based on systemic risk contribution suggested by the International Monetary Fund. INT'L MONETARY FUND, GLOBAL FINANCIAL STABILITY REPORT 75-110 (Apr. 2011).

¹⁰⁹⁹ *See* FRIEDMAN & SCHWARTZ, *supra* note 455, at 436.

specified percentage.¹¹⁰⁰ Despite the lack of sensitivity in this insurance pricing system to risk, it is credited with largely preventing banking panics for over 50 years after its implementation.¹¹⁰¹

As mentioned above, bank failures related to the late 1980s savings and loan crisis caused the FDIC Bank Insurance Fund to become insolvent by \$7 billion. This shortfall, and the recognition that the FDIC had likely underpriced its insurance coverage for large institutions, prompted Congress to address key changes to the structure and insurance policies of the FDIC in what became the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA).¹¹⁰² Among other improvements (including increasing FDIC authority to borrow from Treasury in the wake of the savings and loan crisis), FDICIA required the FDIC to set deposit insurance premiums in relation to the risk the bank poses to the insurance fund.¹¹⁰³ The assessment base was still set at banks' insurable deposit base (up to the FDIC ceiling in effect at the time), but now assessment rates depended on (a) banks' capital ratings (classified in three groups), and (b) banks' "Supervisory Group," a determination based on a bank's score under the CAMELS rating system (a composite score of different bank health metrics).¹¹⁰⁴ Premium payments ranged from a low of 2bps for the most well capitalized banks under the FDIC's base rate system, to 43bps for undercapitalized banks with low CAMELS ratings during periods when the FDIC was attempting to build reserves in what was at the time called the Bank Insurance Fund (BIF).¹¹⁰⁵ While this system sensibly reflected an attempt to have the cost of insurance reflect banks' risk to the BIF, it had several problems. Carnell et al. note that the risk-based pricing arguably still did not account for the degree of failure risk for the riskiest banks,¹¹⁰⁶ perhaps reflected by the fact that the large majority of banks paid the lowest possible rates under

¹¹⁰⁰ *Id.* The idea behind this approach was that assuming anticipated losses to the fund had been correctly estimated, premiums collected in excess of these anticipated losses "over-internalized" the cost of providing the guarantee and accordingly should be returned to covered institutions that had paid them.

¹¹⁰¹ *Id.* at 434-42 (discussing the success of federal deposit insurance at "achieving...the prevention of banking panics").

¹¹⁰² 12 U.S.C. § 1811 (2006).

¹¹⁰³ *Id.* § 1817(b)(1)(A), (C); CARNELL ET AL., *supra* note 475, at 30, 316.

¹¹⁰⁴ For a detailed description of this rating and assessment system (including a definition of the CAMELS rating), see CARNELL ET AL., *supra* note 475, at 316-18.

¹¹⁰⁵ *Id.*

¹¹⁰⁶ *Id.* at 328-29.

this scheme.¹¹⁰⁷ Moreover, when the BIF reached the target Designated Reserve Ratio (1.25% of insured deposits) in 1995, most banks stopped paying premiums altogether; in 1999, for example, 93% of FDIC-insured institutions paid no premiums at all.¹¹⁰⁸

The Dodd-Frank Act recently mandated a third wave of changes to the FDIC insurance pricing system,¹¹⁰⁹ largely prompted by the incurred and expected losses in the DIF (the Deposit Insurance Fund, successor to the BIF) related to the financial crisis. In February 2011, the FDIC promulgated its new rules implementing these Dodd-Frank requirements.¹¹¹⁰ These rules affected both of the primary inputs for deposit insurance pricing. First, the assessment base for all banks was changed “from [a system] based on domestic deposits to one based on assets.”¹¹¹¹ Specifically, while the post-FDICIA regime calibrated premiums to reflect risk through assessment rates on deposits, under the new rules, premiums reflect risk through both assessment rates (which are now based on changed, arguably more sophisticated measures of risk; see discussion below) and the assessment base (which now reflects the overall size of the bank’s balance sheet—not just its deposits). This new measurement of the assessment base highlights a fundamental change in the FDIC’s definition of risk: while historic approaches had been focused on an institution’s covered deposits (which directly represent the maximum potential loss to the DIF), the new approach recognizes that an increase in balance sheet risk—even if it is not funded by additional insured deposits—could increase risk to the DIF. This increased risk comes not necessarily from an increase in the total exposure to loss (i.e., the insured deposit base), but instead from an increase in the probability of losses on the insured deposit base due to increased risky balance sheet activity.

The new rule has modified assessment rates as well, although these rates still depend on similar key inputs, namely capital adequacy and supervisory ratings. The assessment rate system

¹¹⁰⁷ Marcia Millon Cornett et al., *The Impact of Risk-Based Premiums on FDIC-Insured Institutions*, 13 J. FIN. SERVS. RES. 153, 156 (1998). This study finds that under the 1992 initial risk-based pricing system, 92% of banks paid one of the lowest two premiums in the nine-tiered system.

¹¹⁰⁸ Andrew Kuritzkes et al., *Deposit Insurance and Risk Management of the U.S. Banking System: How Much? How Safe? Who Pays?* 7 (Fin. Inst. Ctr., 2000).

¹¹⁰⁹ Assessments, Large Bank Pricing, 76 Fed. Reg. 10,672 (Feb. 25, 2011).

¹¹¹⁰ *Id.*

¹¹¹¹ Press Release, Fed. Deposit Ins. Corp., FDIC Approves Final Rule of Assessments, Dividends, Assessment Base and Large Bank Pricing (Feb. 7, 2011). It also attempts to reduce reliance on Credit Rating Agency ratings in determining insurance assessments. *Id.*

is bifurcated: institutions defined as “small insured depository institutions” (those having less than \$10 billion in assets) pay one set of premiums based on risk classifications. These risk classifications are a function of their risk level (which depends on tangible equity and a supervisory evaluation) and the level of Reserves in the DIF, as set out in the figure below.

Figure 2.16: DIF Assessment Rates¹¹¹²

	Risk Category I	Risk Category II	Risk Category III	Risk Category IV
DIF Reserve Ratio below 1.15 percent	2.5-9 basis points	9-24 basis points	18-33 basis points	30-45 basis points
DIF Reserve Ratio between 1.15 percent and below 2 percent	1.5-7 basis points	7-22 basis points	14-29 basis points	25-40 basis points
DIF Reserve Ratio between 2 percent and below 2.5 percent	1-6 basis points	5-20 basis points	12-27 basis points	23-38 basis points
DIF Reserve Ratio 2.5 percent or higher	0.5-5 basis points	4.5-19 basis points	10-25 basis points	20-35 basis points

In contrast, “large” and/or “highly complex”¹¹¹³ financial institutions pay another set of premiums, which, under the new rule, are not based on risk categories but instead rely on the use of a new risk-based “scorecard” that determines an institution’s “performance score” and “loss severity score,”¹¹¹⁴ which combine to produce an assessment rate. An institution’s performance score is a “weighted average of...three components: the weighted average CAMELS rating score; the ability to withstand asset-related stress score; and the ability to withstand funding-related stress score.”¹¹¹⁵ Its loss severity score “measures the relative magnitude of potential loss

¹¹¹² Assessments, Large Bank Pricing, *supra* note 1109, at 10,717-20; Barbara R. Mendelson & Marc-Alain Galeazzi, Morrison Foerster, *Client Alert: FDIC Approves Final Rule of Assessments, Dividends, Assessment Base and Large Bank Pricing*, at 2 (Feb. 10, 2011) [hereinafter Morrison & Foerster LLP, *Summary of New FDIC Rules*].

¹¹¹³ A large institution is one with more than \$10 billion in assets, while a highly complex institution is one defined to have more than \$50 billion in assets and to be “controlled directly or indirectly by a U.S. parent holding company with \$500 billion or more in total assets.” *Summary of New FDIC Rules, supra* note 1112, at 3.

¹¹¹⁴ Assessments, Large Bank Pricing, *supra* note 1109, at 10,689, 10,695.

¹¹¹⁵ Morrison & Foerster LLP, *Summary of New FDIC Rules, supra* note 1113, at 3.

to the FDIC in the event of the insured depository institution's failure.”¹¹¹⁶ These combine to determine an institution's new risk-adjusted score. While the mechanics are complex, the key point of the new system is as described earlier: to cover the expected losses to the FDIC.

This new FDIC approach to pricing has an important implication for insuring non-deposit liabilities. The FDIC is now correct to recognize that expected loss exposure to the DIF depends on the total net assets of the bank, and not just on insured deposits themselves. This suggests that any scheme insuring non-deposit liabilities should similarly take into account the overall riskiness of the asset side of a financial institution's balance sheet, and not simply the size or particular types of instrument on the liability side of the ledger.¹¹¹⁷ This type of pricing exercise can be accomplished by performing historical credit analysis on portfolios, as the Basel capital adequacy system does.¹¹¹⁸

(b) Option Pricing

The FDIC's approach to pricing insurance starts from the premise (familiar to credit analysts) that the expected cost to the government of providing insurance is equal to the expected losses the insurance fund will incur by providing insurance over time.¹¹¹⁹ This expected loss to the insurance fund is contingent on two factors: the probability of loss (failure of the insured institution) and the magnitude of loss given the failure of the institution.¹¹²⁰ However, both of these factors are difficult to quantify accurately. First, the probability of an individual financial institution failing is a complex function of what is going on in the broader financial system; the loss given default will also be affected by such institutional interdependencies. While one might think that looking at the historical default performance of financial institutions would be

¹¹¹⁶ *Id.*

¹¹¹⁷ *Cf.* Ricks, *supra* note 492 (discussing the necessity of pricing insurance on the basis of the riskiness of the covered firm's activities as a whole).

¹¹¹⁸ For an example of this type of analysis (and the analogues of capital regulation to deposit insurance pricing), see Kuritzkes et al., *supra* note 1108, at 10-14.

¹¹¹⁹ This assumes that the government is not trying to make any profit from its insurance operations, a reasonable assumption. It also, for the moment, neglects the issue of operating costs (assumed to be small in the context of the overall insurance scheme) and any “excess” premium initially required to build sufficient reserves in the new insurance fund. In the jargon of the private property and casualty insurance industry, the following analysis assumes that the government is operating on a run-rate basis with a loss ratio of 100%. CONSTANCE M. LUTHARDT & ERIC A. WIENING, PROPERTY AND LIABILITY INSURANCE PRINCIPLES 3.16 (4th ed. 2005).

¹¹²⁰ While the FDIC assessment base and assessment rate are not conceptually framed in exactly this way, they are both similarly inputs into a broader process of determining expected loss potential at these institutions.

instructive in this regard, models designed to predict the frequency of such “tail-risk” events often suffer from having insufficient historical data for back-testing (particularly in the case of new financial instruments)¹¹²¹ and their over-reliance on assumptions about the normality of outcome distributions.¹¹²² Second, both the probability of failure and the expected loss given failure are affected by the very existence of insurance itself; estimating these variables in a system with insurance versus one without insurance is a particularly difficult question.¹¹²³

While this credit analysis framework may provide a conceptually useful way of thinking about the insurer’s loss exposure, it is not particularly helpful in quantifying precise prices for the insurance itself. In this regard, it may be more helpful to draw on options pricing theory. From the insurers’ perspective, providing a guarantee is analogous to writing a put option on the asset value of the bank, struck at the value of the firm’s non-equity liabilities. Indeed, Robert Merton has made this argument for a long time, and suggested a quantitative model for pricing deposit insurance based on the same readily observable inputs widely used in contemporary options pricing theory.¹¹²⁴ The essential insight from Merton’s analysis is that the option price (i.e., the actuarially fair insurance price) is a function of the volatility of the underlying asset owned by the financial institution; the degree of “moneyness” of the option accordingly corresponds to the equity position of the owners of the firm—when the option, which is owned by the short-term creditors of the institution, is extremely “out of the money,” the equity has positive value, and vice versa.¹¹²⁵

While this option-pricing approach to insurance pricing is elegant and has intuitive appeal, there are some theoretical and practical difficulties with it, which may explain why the FDIC has never adopted this approach to risk-based pricing. On the theoretical front, the option-

¹¹²¹ Argyle Executive Forum, *Argyle Conversation: Evgueni Ivantsov, Head of Portfolio Risk & Strategy, HSBC*, ARGYLE JOURNAL (June 13, 2011), <http://www.argylejournal.com/articles/argyle-conversation-evgueni-ivantsov-head-of-portfolio-risk-strategy-hsbc/>.

¹¹²² Christine Harper, *Death of VaR Evoked as Risk-Taking Vim Meets Taleb’s Black Swan*, BLOOMBERG, Jan. 28, 2008. For a much more detailed treatment of these issues, see, for example, NASSIM TALEB, *THE BLACK SWAN* (2007).

¹¹²³ Presumably, in a credible insurance regime, both the probability of default and the loss given default would be lower (because non-deposit creditors would not have had the incentive to run). This reflects Friedman and Schwartz’s insight that liability insurance “tends to reduce the contingency insured against.” FRIEDMAN & SCHWARTZ, *supra* note 455, at 440.

¹¹²⁴ Merton, *supra* note 1042, at 3.

¹¹²⁵ *Id.*

pricing formula requires an assumption about the shape of the distribution of returns for bank asset valuations.¹¹²⁶ On the practical front, since most banks in the United States, and smaller institutions in particular, do not have publicly traded equity, obtaining accurate asset pricing information could be difficult, although this problem is mitigated if the insurance coverage is limited to larger institutions.¹¹²⁷

(c) Timing/Phasing/Management of Insurance Premiums

Ex ante funding of an insurance system also raises the question of how the insurance premiums collected will be managed before they are actually used. Presumably the premiums collected would be paid into a government-managed fund. The Committee has previously expressed skepticism about the use of such funds, as history suggests that these pools of capital are occasionally appropriated for purposes other than their intended use.¹¹²⁸ Accordingly, if such an ex ante system is adopted, the funds should be ring-fenced and not available for allocation to other projects. Moreover, within this ring-fence, the assets will need to be managed in a prudent way. Historically, the FDIC has been required to invest its proceeds primarily in Treasury securities; one logical approach would be to require the proposed insurance fund to adopt similarly conservative investment strategies, seeking to match the duration of its asset portfolio as closely as possible to the expected duration of its liabilities, as any commercial insurer would.¹¹²⁹

(2) Ex Post Payment Option

A second approach that would look very different from the ex ante-funded insurance systems discussed above would be for the government to issue a guarantee of the short-term non-deposit liabilities of financial institutions above the designated asset threshold, and to fund this guarantee on an ex post basis, by levying a charge on covered institutions (or their stakeholders) after the crisis has passed. From the perspective of short-term creditors who would benefit from

¹¹²⁶ Merton's approach to option pricing for deposit insurance, and several notable extensions to it, require the assumption of log-normal returns. See Alan J. Marcus & Israel Shaked, *The Valuation of FDIC Deposit Insurance Using Option Pricing Estimates*, 16 J. MONEY, CREDIT & BANKING 446 (Nov. 1984).

¹¹²⁷ *Id.* at 457.

¹¹²⁸ Although this has not occurred with the DIF, the Committee does discuss other examples of this risk in a letter on the Orderly Liquidation Fund created by Dodd-Frank.

¹¹²⁹ FED. DEPOSIT INS. CORP., *supra* note 537, at 52 (describing how the FDIC has become increasingly sophisticated in terming out its reserve investments to match liquidity with expected payouts).

the guarantee, these two approaches would provide the same protection; the difference is that there would be no permanent “insurance fund” under the ex post system, so the payout to short-term creditors of a failed covered institution would first be covered by the government, which would then later recoup the cost of the guarantee through assessments on covered institutions. One advantage of the ex-post-funded system is that the guarantee does not cost anything unless a covered institution actually fails and the guarantee is used. The mechanics of how an ex post charge would work presents challenges in terms of who would pay the charge and what the size of the charge would be.

Determining who would pay the charge requires two levels of analysis: which institutions would pay the charge and which stakeholders of those institutions would be liable.¹¹³⁰ One might start from the principle that those who benefit from the insurance system should bear the cost of it; on this view, short-term creditors of the failed institution would appear to be the obvious beneficiaries and thus the responsible parties. However, there are two reasons to favor applying the charge more broadly, with respect to both institutions and stakeholders. First, the potential benefits of a guarantee are much broader than any particular troubled institution or its own stakeholders; other stakeholders (besides short-term creditors) in the covered institution benefit because they do not have the value of their investments impaired by contagious run behavior during crises. Short-term creditors and longer-term stakeholders in other covered financial institutions also benefit because of the reduced systemic risk due to a lower likelihood of contagious runs. Second, if the charge were focused only on short-term creditors of particular troubled institutions, this may actually cause these creditors to run in anticipation of a levy on that institution, thereby exacerbating rather than mitigating the problem of contagious panic. Both of these arguments suggest that the charge should be broadly based with respect to both institutions and stakeholders. While the specific details warrant further analysis, the basic principle is that the charge should be shared between the short-term and long-term creditors and equity holders of systemically important financial institutions generally. Additionally, imposing small charges on a wider range of stakeholders would reduce the risk of distorting the markets

¹¹³⁰ This discussion about the appropriate stakeholders to charge parallels the discussion about which stakeholders should pay for TARP investment shortfalls. *See supra* Part II(B)(3)(c)(i).

for short or long-term capital (compared with imposing larger, more concentrated charges on particular groups of stakeholders).

Determining the size of the charge under an ex post system would also pose challenges. Perhaps the most obvious way to size the ex post charge would be to simply assess a charge equivalent to the realized cost of guarantee (which would be known after resolving a failed covered institution). Under this approach, charges would only be assessed in the (hopefully) relatively rare event that covered institutions actually fail. While this is arguably attractive, because payments to cover the cost of the short-term liability guarantee would only be required in the rare case that they have been paid out, it is not clear that the magnitude of the necessary ex post assessments can optimally reduce ex ante moral hazard for covered institutions and their stakeholders.¹¹³¹ The specific size of charges that would optimally cover the cost of providing the guarantee and effectively mitigate moral hazard is a question for empirical analysis if such a system were implemented; the key point here is that regulators would need to retain the flexibility to set charges in a way that does not unduly burden or distort the financial system and capital markets.

(3) Payment upon Implementation Option

A third option for an insurance scheme could be to implement a guarantee program for short-term non-deposit creditors of financial institutions only when it becomes apparent that there is a crisis involving heightened systemic risk. Under such a system, there would be no standing guarantee for non-deposit creditors (as in either of the previous two approaches) or standing insurance fund (as in the ex ante-funded approach). Rather, the government (perhaps led by FSOC) would monitor systemic risk and issue a guarantee to a relevant set of short-term non-deposit creditors¹¹³² when it is perceived to be necessary. The guarantee itself would be mandatory for all institutions determined to be within the scope of coverage; this would ensure

¹¹³¹ Specifically—and unlike under the ex ante system, where insurance pricing is calibrated to the risk of specific institutions—under an ex post system, the charge would have to be assessed across a wide range of institutions whenever a particular covered institution failed (otherwise, a concentrated charge might promote, rather than reduce, the likelihood of run behavior of short-term creditors of that institution).

¹¹³² For a discussion of which creditors should be covered, see *supra* Part II(B)(2)(ii).

maximum protection against contagious panic.¹¹³³ Such a system could be funded through assessments on covered institutions at the time the guarantee is furnished; to the extent such assessments were insufficient to cover the cost of the guarantee (in the event that covered institutions fail), the government would stand behind the guarantee, and could make up any shortfall in assessed charges on covered institutions with a supplemental ex post charge (along the lines of what was discussed above, though perhaps more modest in size).

This type of system closely resembles Treasury's actual guarantee of money market mutual funds during the financial crisis. On September 18, 2008 (three days after the failure of Lehman Brothers, which was the catalyst for the Reserve Primary fund breaking the buck and the run on money market mutual funds).¹¹³⁴ Treasury announced that it would guarantee a minimum \$1 net asset value per share (NAV) for shares of money market mutual funds regulated under Rule 2a-7 of the Investment Company Act of 1940 that had a NAV of \$0.995 or greater as of the close of business on September 19, 2008.¹¹³⁵ Participation in the program was voluntary—at the discretion of MMMFs themselves, not investors in MMMFs—and MMMFs that elected to participate were required to pay a one-time fee to cover the period of guarantee coverage, which was initially for three months from September 19, 2008 until December 19, 2008.¹¹³⁶ This guarantee divided the covered MMMFs into two rudimentary risk buckets: funds with a NAV greater than or equal to \$0.9975 as of the close of business September 19, 2008 paid an up-front fee of 0.01% (i.e., one basis point) of NAV for the period of coverage; funds with NAV of \$0.995 (the coverage floor) to \$0.9975 paid a fee of 0.015% (i.e., one and a half basis points). The program was subsequently extended twice, first until April 30, 2009, and then until September 18, 2009. Covered institutions in the two risk buckets (still determined by NAV as of September 18, 2008) paid fees of 0.015% and 0.022% for the first extension period, and 0.015% and 0.023% for the second extension period, respectively.

¹¹³³ By contrast, Treasury's guarantee of MMMFs during the financial crisis was voluntary; MMMFs (and not their shareholders) could opt to join by paying a fee (discussed in the next paragraph). While the practical impact of Treasury's guarantee was ultimately quite similar to a mandatory guarantee—nearly all major MMMFs, representing over \$3 trillion in industry assets under management, opted to join—it seems reasonable to expect that a mandatory guarantee would be even more effective at minimizing the possibility of systemic contagion, particularly as applied to a potentially broader set of institutions than just MMMFs and depository institutions.

¹¹³⁴ For more detail on the collapse of the Reserve Primary Fund, see *supra* Part I.B.5.

¹¹³⁵ Press Release, U.S. Dep't of the Treasury, *supra* note 557.

¹¹³⁶ *Id.*

Treasury's MMMF guarantee program was widely regarded as a success,¹¹³⁷ which highlights the fact that a non-deposit liability guarantee implemented only when it is needed can be effective without placing an undue burden on financial institutions that are forced to pay during non-crisis periods. (This argument is particularly compelling for those who are skeptical of the government's ability to accurately price ex ante-funded insurance.) However, there are several issues to note regarding this approach as well. First, although Treasury both announced and implemented its MMMF guarantee system when potential systemic risk from a run on MMMFs became apparent, there is no reason that these two steps must be taken at the same time. Specifically, the government could announce ex ante that it will implement a guarantee if necessary during a crisis, but not actually implement the guarantee (or charge covered institutions for it) until it became necessary during a crisis. Administering the guarantee in this way could have the advantage of greater predictability (and possibly effectiveness), while minimizing the cost of the guarantee to covered institutions. The details of feasibility and timing for this type of alternative would be a matter for further detailed study. Second, while covered institutions can ultimately expect to internalize the cost of such insurance (through when-implemented assessments and, potentially, supplementary ex post assessments), given that the insurance is only implemented once a crisis has hit, one might question whether such an approach is as effective at solving the moral hazard problem as the ex ante approach since it lacks the ex ante pricing that could possibly deter risky behavior. Finally, there is a strong incentive for the government to underprice this type of insurance compared to ex ante or ex post insurance, because it is actually levied during a crisis (as opposed to before or after the crisis, when the covered institution is presumably in better financial shape). Charging assessments during crises that could increase the probability of financial institution failure would clearly be suboptimal. Nevertheless, it will be important to weigh these issues against the shortcomings of other forms of insurance systems in making any final determination of which sort of insurance is likely to be most effective.

¹¹³⁷ The program generated fees of \$1.2 billion for Treasury, and not a single MMMF failed after the implementation of the guarantee. Press Release, U.S. Dep't of the Treasury, Treasury Announces Expiration of Guarantee Program for Money Market Funds (Sept. 18, 2009).

3. Public Capital Injections or “Bailouts”

This section focuses on public capital injections into banks, which for short we will call “bailouts,” as distinct from liquidity support from the Federal Reserve. While the central bank’s role as lender of last resort is well established, bailouts are more controversial. As Bernardo, Talley, and Welch (2011) suggest, prior to 2007, most academic economists viewed government bailouts as “aberrations of developing countries, artifacts of political patronage, or idiosyncrasies of the banking industry.”¹¹³⁸ Significant academic skepticism remains “about the wisdom of bailouts as a categorical matter.”¹¹³⁹ More importantly, bailouts are now regarded as politically taboo under the anti-bailout consensus in Washington.

One could argue that complete protection of short-term liabilities could make public injections of capital unnecessary. Insolvent institutions could be resolved without fear of generating a run by short-term creditors. In the financial crisis, TARP became essential once the Fed said it would no longer provide unlimited liquidity. This issue of Fed versus fiscal support is playing out again in Europe, where Draghi has now reversed his Bernanke-like stand when it became clear sufficient fiscal support would not be forthcoming. There seem to be two reasons why the central bank would draw the line. The most important is inflation, the possible result of unlimited liquidity. While not a problem in our crisis or in Europe now, it could be so in the future when a crisis hits. And second is legitimacy. Bernanke likely felt that support for the financial system at some level should ultimately be decided by the political process rather than by the central bank.

Absent liquidity and guarantees, and apart from the politics, bailouts may be the lesser of two evils if economic collapse is the alternative. The U.S. government made it clear that it was helping troubled banks only reluctantly when the bailout legislation was passed. Chairman Bernanke said: “Government assistance should be provided with the greatest reluctance and only when the stability of the financial system, and thus the health of the broader economy, is at risk. In those cases when financial stability is threatened, however, intervention to protect the public

¹¹³⁸ See Antonio Bernardo, Eric Talley & Ivo Welch, *A Model of Optimal Government Bailouts 2* (May 2011), http://www.law.berkeley.edu/files/bclbe/Model_of_Optimal_Bailouts_0503.pdf.

¹¹³⁹ *Id.* at 3.

interest may well be justified.”¹¹⁴⁰ The sentiment was echoed by then Secretary Paulson: “We regret having to take these actions. Today’s actions are not what we ever wanted to do—but today’s actions are what we must do to restore confidence to our financial system.”¹¹⁴¹

Bailouts involve at least the up-front use of taxpayers’ money and often result from an ad hoc rescue plan put in place after a crisis has already erupted. The practice stands in stark contrast to systematic responses to crises such as the FDIC’s receivership of a failed depository institution, which is a foreseeable application of existing regulatory rules. As a result, politics play a prominent role in the designing of bailout plans. This issue is particularly pronounced in the United States, where the executive branch does not have any standing power to inject capital into troubled financial institutions without Congressional authorization.¹¹⁴² Congressional negotiations may reach an impasse and the final result could be highly unpredictable.

Government bailouts by U.S. and European governments during the financial crisis were carried out primarily through preferred stock investments. Preferred stock was also the primary investment tool used by the Reconstruction Finance Corporation during the Great Depression.¹¹⁴³ Preferred stock has several advantages over other instruments. First, it can be structured to qualify for the firm’s Tier 1 capital while retaining debt-like characteristics of deductible interest payments that could be relevant to investors that might later buy the stock from the government. However, normally this capital and tax treatment will require the preferred stock to be perpetual with no dividend rate step-ups. Also, cumulative perpetual preferred stock that a bank holding company may include in its Tier 1 capital is subject to a 25% limit.¹¹⁴⁴ However, capital injections by the U.S. government during the financial crisis were specifically exempted by the

¹¹⁴⁰ Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys., Current Economic and Financial Conditions (Oct. 7, 2008), <http://www.federalreserve.gov/newsevents/speech/bernanke20081007a.htm>.

¹¹⁴¹ Press Release, U.S. Dep’t of the Treasury, Statement by Secretary Henry M. Paulson, Jr. on Actions to Protect the U.S. Economy (Oct. 14, 2008), <http://www.treasury.gov/press-center/press-releases/Pages/hp1205.aspx>.

¹¹⁴² In comparison, the UK bailout plan was designed by HM Treasury in consultation with the Bank of England and the Financial Services Authority. See Press Release, HM Treasury, Financial Support to the Banking Industry (Oct. 8, 2008), http://www.hm-treasury.gov.uk/press_100_08.htm.

¹¹⁴³ See Alex Pollock, *TARP on a Businesslike Basis, Statement Before the Congressional Oversight Panel of the Troubled Asset Program* (Nov. 19, 2009), <http://cybercemetery.unt.edu/archive/cop/20110401231809/http://cop.senate.gov/documents/testimony-111909-pollock.pdf>.

¹¹⁴⁴ 74 Fed. Reg. 26,081 (June 1, 2009) (to be codified at 12 C.F.R. pt. 225).

Federal Reserve from these requirements.¹¹⁴⁵ On the other hand, interest payments put a burden on the financial institution that common stock does not. Second, the government as preferred stockholder ranks between debt holders and common stockholders in terms of priority. It is therefore possible to dilute or eliminate common stockholders' interests while protecting the value of the company's other debt securities. Third, preferred stock does not put the government in the limelight as the owner of an institution even though it may exert considerable influence on the management through contractual arrangements granting the holder voting power and/or veto power on strategic issues as well as the power to appoint directors and remove the board.¹¹⁴⁶

There were some important exceptions to the general use of preferred stock during the financial crisis. For example, the U.K. government invested in RBS and Lloyds mainly through common stock or stock ranking *pari passu* with common stock.¹¹⁴⁷ Also, at the later stages of its investments in Citigroup, AIG and other financial institutions, the U.S. Treasury replaced its preferred stock with common stock.¹¹⁴⁸ Apart from the obvious benefit of savings on interest payments, one reason cited by the recipient banks for the conversion was the market's view that tangible common equity is an important measure of financial strength, even if preferred stock would also qualify for Tier 1 capital.¹¹⁴⁹ Treasury agreed because it believed that the conversion would facilitate its exits through subsequent common stock sales.¹¹⁵⁰

a. Justifications for Bailout of Financial Institutions

Even though bailouts may be politically disfavored, there are several sound policy reasons that can justify the government's injection of capital into a troubled financial institution.

¹¹⁴⁵ *Id.*

¹¹⁴⁶ See Transcript of "The Man in the Middle of the TARP: A Discussion with Treasury's Neel Kashkari" (Jan. 8, 2009), http://www.brookings.edu/~media/Files/events/2009/0108_kashkari/20090108_kashkari.pdf.

¹¹⁴⁷ See Royal Bank of Scotland Placing and Open Offer Agreement, Oct. 13, 2008, http://www.hm-treasury.gov.uk/d/combined_rbs_hbos_lloydstsb.pdf; see also Press Release, Royal Bank of Scotland, Trading Update and Capital Restructuring (Jan. 19, 2009), <http://www.investors.rbs.com/ir/rbs/ir.jsp?page=news-item&item=72685882093332>.

¹¹⁴⁸ See Press Release, U.S. Dep't of the Treasury, Treasury Announces Participation in Citigroup's Exchange Offering (Feb. 27, 2009), <http://www.treasury.gov/press-center/press-releases/Pages/tg41.aspx>; see also Am. Int'l Group, Inc., Current Report on Form 8-K filed Jan. 14, 2011, <http://sec.gov/Archives/edgar/data/5272/000095012311003061/y88987e8vk.htm>.

¹¹⁴⁹ See Press Release, Citigroup, Citi to Exchange Preferred Securities for Common, Increasing Tangible Common Equity to as Much as \$81 Billion (Feb. 27, 2009), <http://www.citigroup.com/citi/press/2009/090227a.htm>.

¹¹⁵⁰ See Press Release, U.S. Dep't of the Treasury, Treasury Converts Nearly Half of Its Ally Preferred Shares to Common Stock (Dec. 30, 2010), <http://www.treasury.gov/press-center/press-releases/Pages/tg1014.aspx>.

First, as we have seen, while the failure of an institution can trigger contagion as in Lehman, the announcement of a government bailout, as in AIG, can quell the fears of short-term creditors (albeit not sufficiently in that case), thus lessening the probability of contagion. The adequacy of the actual bailout measure may not even matter to investors. The Congressional Oversight Panel's member Damon Silvers observed: "The reason, however, for the success of the CPP infusions into the nine largest banks was...not that those infusions by themselves made those institutions adequately capitalized or resolved the toxic asset problem. It worked because it was a credible signal, together with other guarantees issued by Treasury and the FDIC, that the U.S. government was guaranteeing the solvency of the large banks."¹¹⁵¹ It may be, therefore, less costly to the financial system to rescue a troubled institution than to let it fail.

Capital injections may become necessary when other measures including central bank lending or government guarantees are no longer effective. If the financial institution is in trouble because significant losses have consumed its equity base, additional lending to the institution or a guarantee of its liabilities may not help. To remain viable, the institution has to be recapitalized. As one expert puts it, no matter how much a central bank lends to entities with negative capital, "the capital is still negative."¹¹⁵² Many experts have compared the current financial crisis with the Great Depression and pointed out that the Reconstruction Finance Corporation (RFC) became successful only after it switched from making loans to troubled banks to making preferred stock investments because the more RFC lent, the less likely that unsecured creditors could recoup their investments.¹¹⁵³ As a result, studies have found that the more banks borrowed from the RFC during the Great Depression, the more likely they were to fail.¹¹⁵⁴ Bailout, therefore, plays a role that may not be fulfilled by other forms of public assistance. Unlike resolution, bailouts keep creditors afloat—including short-term creditors—and thus prevent contagion.

¹¹⁵¹ See CONG. OVERSIGHT PANEL, DECEMBER OVERSIGHT REPORT 114 (Dec. 2009), <http://cybercemetery.unt.edu/archive/cop/20110401233008/http://cop.senate.gov/documents/cop-120909-report.pdf>.

¹¹⁵² See Pollock, *supra* note 1143, at 2.

¹¹⁵³ See *id.*; see also Calomiris, *supra* note 467, at 9-10; *Hearing Before the Congressional Oversight Panel Hearing to Examine Government Responses to Major Banking Crises of the 20th Century* 4-5 (Statement of Eugene White, Mar. 2009), <http://cybercemetery.unt.edu/archive/cop/20110401231927/http://cop.senate.gov/documents/testimony-031909-white.pdf>.

¹¹⁵⁴ See Calomiris, *supra* note 467, at 9-10.

Bailouts may be necessary even despite efforts to raise private capital. To avoid failure, financial institutions may try to shore up capital by raising new private equity. Many banks were actively seeking to augment their capital bases or merge with a stronger bank at the early stage of the financial crisis. Shortly before the announcement of the Capital Purchase Program, both Goldman Sachs and Morgan Stanley were able to secure financing from sources such as Warren Buffet and foreign investors.¹¹⁵⁵ Private capital, however, may be insufficient and therefore make public investments necessary. First, some may fail to secure private financing, as in Lehman's case. In any event there may not be sufficient private equity capital available to support several large institutions at the same time. Before the U.S. government stepped in, the only realistic funding sources available in September 2008 seemed to be various sovereign wealth funds.¹¹⁵⁶ Second, the market may become temporarily dysfunctional. Due to asymmetric information, private investors may refuse to invest in troubled financial institutions; the government may be in a better position to overcome the information asymmetry.¹¹⁵⁷ Third, a troubled financial institution may not be able to attract new private equity because of the problem of "debt overhang." If a firm is heavily leveraged and is on the verge of bankruptcy, any increase in firm value due to an equity infusion largely goes to debt holders.¹¹⁵⁸ Government intervention thus becomes necessary to overcome the debt overhang problem.

Lastly, troubled financial institutions in theory could also sell their illiquid and troubled assets to generate capital. Diamond and Rajan (2010) ask why new investors, such as vulture funds, did not step in to purchase those assets at a bargain price during the financial crisis.¹¹⁵⁹ They argue that the possibility of a future fire sale may explain banks' inability to dispose of toxic assets. Even if buyers and sellers could agree on the current price of the underlying securities, buyers may agree to buy only at a further discount because they expect that sellers

¹¹⁵⁵ See Susanne Craig et al., *Buffet to Invest \$5 Billion in Goldman*, WALL ST. J., Sept. 24, 2008.

¹¹⁵⁶ One recent report suggests that China's sovereign wealth fund, the China Investment Corporation, was prepared to raise its stakes in Morgan Stanley to 49% before then Federal Reserve Bank of New York president Timothy Geithner allegedly blocked the transaction. See Paritosh Bansal et al., *The U.S. and China Start an M&A Cold War*, REUTERS, <http://www.reuters.com/article/2011/04/12/us-specialreport-china-merger-idUSTRE73B47V20110412>.

¹¹⁵⁷ See Calomiris, *supra* note 467, at 4; see also Dinara Bayazitova & Anil Shivdasani, *Assessing TARP*, 25 REV. FIN. STUD. 377, 378 (2012).

¹¹⁵⁸ See Pietro Veronesi & Luigi Zingales, *Paulson's Gift* 5 (Oct. 2009), http://faculty.chicagobooth.edu/brian.barry/igm/P_gift.pdf. The concept of debt overhang was first formalized in Stewart C. Myers, *The Determinants of Corporate Borrowing*, 5 J. FIN. ECON. 147 (1977).

¹¹⁵⁹ See Douglas Diamond & Raghuram Rajan, *Fear of Fire Sales and the Credit Freeze* 1 (BIS Working Papers No. 305, Mar. 2010), <http://www.bis.org/publ/work305.pdf>.

may fail and conduct a future fire sale at a cheaper price. Sellers, on the other hand, may feel that a current sale will largely benefit debt holders due to their potential failure, while they may receive a higher return if they could survive and the prices of the assets increase. Regulators could cure the problem by forcing timely sales of illiquid assets. Alternatively, regulators may recapitalize the financial institutions to eliminate the possibility of future fire sales.¹¹⁶⁰

Greenwood et al. contend that modest equity injections can dramatically reduce systemic risk if they are optimized to minimize the aggregate impact of fire sales.¹¹⁶¹ As discussed below, although Treasury initially intended to pursue the purchase of toxic assets, it quickly chose the recapitalization plan instead because sale of illiquid assets involved complicated pricing issues and would be too slow to implement. On the other hand, a recapitalization plan could be quickly rolled out and would have the added benefit of boosting lending activities.

We turn now to examining the Capital Purchase Program, the principal form of capital injection used by the U.S. during the financial crisis.

b. Capital Purchase Program

As the earlier part of this paper has discussed in detail, the collapse of Lehman Brothers triggered widespread turmoil in the global financial market beyond the expectations of Chairman Bernanke and Secretary Paulson.¹¹⁶² Just two days after its bankruptcy, the Federal Reserve had to extend an \$85 billion emergency credit facility to AIG, even though some might have considered a capital injection by Treasury to be the better response. The market was deeply confused by the government's seemingly ad hoc bailout decisions. Who will be bailed out? Who will be let go? Following Bear Stearns' rescue a few months before, it was assumed that others would also be bailed out. When Lehman sent the opposite message, the rescue of AIG just days later was insufficient to stop contagion fueled by the continuing guessing game. The government finally abandoned its ad hoc approach, which had so far relied heavily on the Federal Reserve and the FDIC, and decided to adopt a comprehensive and proactive plan with direct involvement by the Treasury.

¹¹⁶⁰ *Id.* at 1-3, 20.

¹¹⁶¹ Greenwood et al., *supra* note 504, at 3.

¹¹⁶² See FCIC REPORT, *supra* note 26, at 339.

After the rescue of AIG, it was highly uncertain that a bailout plan could be quickly approved. Initially, members of Congress were outraged by Secretary Paulson’s original three-page proposal for granting Treasury broad authority to purchase \$700 billion of toxic assets.¹¹⁶³ Even after the proposal was greatly expanded, it was rejected by the House of Representatives on September 29, 2008 by a vote largely along party lines (with Republicans opposing).¹¹⁶⁴ The stock market plummeted after the veto.¹¹⁶⁵ The Senate voted two days later to pass a revised bill and the final bill passed the House only after many Congressmen reluctantly switched positions.¹¹⁶⁶

The resulting Emergency Economic Stabilization Act of 2008 (EESA) established the Troubled Assets Relief Program (TARP) to stabilize the U.S. financial system.¹¹⁶⁷ The core of the recapitalization plan under TARP was the Capital Purchase Program (CPP), under which “healthy, viable” financial institutions would receive capital injections from Treasury.¹¹⁶⁸ The first nine recipients—the systematically important banks in the United States—had already agreed to the recapitalization plan when Secretary Paulson announced the plan on October 14, 2008.¹¹⁶⁹ There were, however, reports that some of these participants were forced into accepting the offer.¹¹⁷⁰

The CPP was a program open to all qualified financial institutions approved by their respective banking regulators.¹¹⁷¹ The government wanted healthy as well as less healthy banks to take government assistance to avoid publicly identifying any banks as insolvent. However, not only is it likely that analysts could independently distinguish the relative health of the banks, but

¹¹⁶³ See Mark Landler & Steven Lee Myers, *Congress Grills Paulson and Bernanke on Rescue Plan*, N.Y. TIMES, Sept. 23, 2008.

¹¹⁶⁴ See Carl Hulse & David M. Herszenhorn, *House Rejects Bailout Package, 228-205; Stocks Plunge*, N.Y. TIMES, Sept. 29, 2008.

¹¹⁶⁵ *Id.*

¹¹⁶⁶ See David M. Herszenhorn, *Bailout Plan Wins Approval; Democrats Vow Tighter Rules*, N.Y. TIMES, Oct. 3, 2008.

¹¹⁶⁷ Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343, 122 Stat. 3765.

¹¹⁶⁸ See OFFICE OF THE SPECIAL INSPECTOR GENERAL FOR THE TROUBLED ASSET RELIEF PROGRAM, QUARTERLY REPORT TO CONGRESS 76 (Jul. 28, 2011), http://www.sig tarp.gov/reports/congress/2011/July2011_Quarterly_Report_to_Congress.pdf [hereinafter July SIGTARP Report].

¹¹⁶⁹ See Mark Landler & Eric Dash, *Drama Behind a \$250 Billion Banking Deal*, N.Y. TIMES, Oct. 14, 2008.

¹¹⁷⁰ *Id.*

¹¹⁷¹ July SIGTARP Report, *supra* note 1168, at 76.

also the banks that neither needed nor wanted to participate immediately made that known to the markets.¹¹⁷² The demand for CPP investments soared after the market considered receiving CPP funding as getting on the “survivor list” and those not receiving the investments as too unhealthy to be rescued.¹¹⁷³ Also adding to the demand was the opportunity the CCP presented for small banks to obtain a relatively cheap source of funding through the program. Between October 2008 and December 2009, Treasury invested a total of \$205 billion in 707 banking institutions.¹¹⁷⁴ Although the initial investments in the nine financial institutions in October 2008 accounted for more than half of the total CPP investments¹¹⁷⁵ and ten of the largest firms received almost 70% of the funds under the CPP,¹¹⁷⁶ Treasury made numerous smaller investments in institutions of less than \$100 million in assets.¹¹⁷⁷ These investments in non-systemically important institutions had little to do with staving off contagion or protecting the U.S. economy. Rather, it was not politically feasible to give money only to large financial institutions.

Participating financial institutions received capital injections under the same standard terms irrespective of their financial health.¹¹⁷⁸ Most investments were in the form of perpetual preferred shares, although those firms that could not issue preferred shares (e.g., S corporations) issued subordinated debt instead.¹¹⁷⁹ In the end, only about 50 banks, mainly small community banks, issued subordinated debt instead of preferred shares.¹¹⁸⁰ Below is a summary of the key investment terms under the CPP. According to the Congressional Oversight Panel, the

¹¹⁷² See *Oversight of Implementation of the Emergency Economic Stabilization Act of 2008 and of Government Lending and Insurance Facilities; Impact on Economy and Credit Availability Before the H. Comm. on Fin. Servs.*, 110th Cong. 7 (2008) (statement of Alan S. Blinder, Professor of Economics and Co-Director of the Center for Economic Policy Studies, Princeton University).

¹¹⁷³ See Elizabeth Williamson, *Rescue Cash Lures Thousands of Banks*, WALL ST. J., Nov. 3, 2008.

¹¹⁷⁴ See July SIGTARP Report, *supra* note 1168, at 76.

¹¹⁷⁵ One of the initial nine institutions, Merrill Lynch, was acquired by Bank of America and the \$10 billion investment for Merrill Lynch was later provided to Bank of America after the acquisition.

¹¹⁷⁶ See July SIGTARP Report, *supra* note 1168, at 77.

¹¹⁷⁷ *Id.*

¹¹⁷⁸ See *Capital Purchase Program*, U.S. DEP’T OF THE TREASURY, <http://www.treasury.gov/initiatives/financial-stability/programs/investment-programs/cpp/Pages/capitalpurchaseprogram.aspx>.

¹¹⁷⁹ *Id.*

¹¹⁸⁰ For a list of banks issuing subordinated debts to the Treasury, see *Transactions Report-Investment Programs*, U.S. DEP’T OF THE TREASURY, http://www.treasury.gov/initiatives/financial-stability/briefing-room/reports/tarp-transactions/DocumentsTARPTransactions/11-10-11%20Transactions%20Report%20as%20of%2011-09-11_INVESTMENT.pdf.

documentation for CPP investments was “quite similar to, and appears to be based on,” the documentation for Warren Buffet’s earlier investment in Goldman Sachs.¹¹⁸¹

Figure 2.17: Standardized Investment Terms under the Capital Purchase Program¹¹⁸²

<i>Size</i>	<ul style="list-style-type: none"> 1-3% of risk-weighted assets (increased to 5% for small banks) but no more than \$25 billion.
<i>Preferred securities issued</i>	<ul style="list-style-type: none"> Senior perpetual nonconvertible preferred shares at \$1,000 per share.
<i>Dividend rights</i>	<ul style="list-style-type: none"> Quarterly cumulative compounding dividends for institutions that are not subsidiaries of bank holding companies. (Note this requirement does not apply to most of the large recipients, as CPP investment is required to occur at the highest holding level.) Noncumulative dividends for those that are subsidiaries of bank holding companies in order to qualify as Tier 1 capital. 5% per annum for the first five years, 9% thereafter.
<i>Voting rights</i>	<ul style="list-style-type: none"> Limited customary voting rights for preferred stock.¹¹⁸³ If dividends are not paid for six quarters, holders of preferred shares have the right to elect two directors to board.
<i>Redemption of preferred shares</i>	<ul style="list-style-type: none"> Preferred shares cannot be redeemed within the first three years unless a qualified equity offering occurs. (This requirement was later changed by the American Recovery and Reinvestment Act of 2009 (ARRA)¹¹⁸⁴ which permits redemption in full subject to consultation with appropriate banking regulators.)
<i>Warrants issued</i>	<ul style="list-style-type: none"> In addition to nonconvertible preferred shares, for a <i>public company</i>, Treasury receives warrants to purchase common stock in an amount equal to 15% of Treasury’s preferred stock investment at exercise price. Exercise price equals average market price of the common stock in the 20-day period prior to the acceptance of the application by Treasury. For a <i>private company</i>, Treasury receives warrants to purchase a separate series of preferred stock (with a dividend rate of 9%) in an amount up to 5% of its original preferred stock investment. Treasury will exercise these warrants immediately.¹¹⁸⁵ Warrants valid for 10 years. The investee has the right to reduce the number of shares underlying the warrants by half if it raises 100% of the issue price of the preferred stock in qualified offerings before the end of 2009.

¹¹⁸¹ See TIMOTHY G. MASSAD, REPORT TO CONGRESSIONAL OVERSIGHT PANEL FOR ECONOMIC STABILIZATION: LEGAL ANALYSIS OF THE INVESTMENTS BY THE U.S. DEPARTMENT OF THE TREASURY IN FINANCIAL INSTITUTIONS UNDER THE TROUBLED ASSET RELIEF PROGRAM 3 (Jan. 27, 2009), <http://cybercemetery.unt.edu/archive/cop/20110402034824/http://cop.senate.gov/documents/cop-020609-report-dpvaluation-legal.pdf>.

¹¹⁸² This summary is based on the acquisition agreement for Treasury’s investment in JPMorgan Chase investment, which is available at http://www.treasury.gov/initiatives/financial-stability/programs/investment-programs/cpp/Documents_Contracts_Agreements/JPMorgan_Chase_Agreement_Dated_26_October_2008.pdf, and information in July SIGTARP Report, *supra* note 1168, at 76.

¹¹⁸³ Note that by design Treasury will not explicitly exercise day-to-day control of the CPP recipients. Such control is indirectly achieved through measures such as a contractual requirement on management compensation and Treasury’s implicit threat to take over the bank by converting its holdings into common stock.

¹¹⁸⁴ American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115.

¹¹⁸⁵ The difference in treatment of public and private companies largely stems from the fact that Treasury will hold privately issued securities with no readily available market prices. Treasury may also, as a result, hold the securities for a longer period of time.

<i>Repurchase of warrants</i>	<ul style="list-style-type: none"> • The issuer has right to repurchase any equity securities (including warrants) held by Treasury at fair market value once the preferred shares are redeemed or transferred. • If the issuer does not repurchase the warrants, Treasury may sell them by auction.
<i>Covenants</i>	<ul style="list-style-type: none"> • Dividends on common stock must be capped at the last quarterly level in the first three years. For private companies, dividend payments could increase only 3% each year thereafter and no dividend permitted after 10 years.¹¹⁸⁶ • Executive compensation practices to comply with EESA requirements, as subsequently amended by AARA and interpreted by Treasury regulations. These restrictions include: (1) prohibition on bonus payments during TARP assistance to the five senior executive officers and the next 20 most highly-compensated employees except in the form of limited long-term restricted stock; (2) prohibition on severance payments to the five senior executive officers and the next five most highly-compensated employees during TARP assistance; (3) adoption of governance standards that eliminate unnecessary risk-taking incentives and prohibit plans encouraging earnings manipulation; and (4) clawback of improperly determined payments to the five senior executive officers and the next 20 most highly-compensated employees.¹¹⁸⁷ • There is no covenant as to the use of proceeds, the adoption of a restructuring plan or other restriction on business activities.

Although some recipients have failed, most notably CIT Group, which received \$2.3 billion under the CPP, and many small banks have failed to pay quarterly dividends, overall the program has been a success.¹¹⁸⁸ The market gradually returned to normal after the implementation of the general guarantee programs and the CPP, which sent a strong signal that the government would guarantee the solvency of all of the remaining systemically important financial institutions.¹¹⁸⁹ As of March 31, 2012, \$186.9 billion of the principal (91.2%) had been repaid, leaving \$15.7 billion outstanding.¹¹⁹⁰ The top 10 CPP recipients have all redeemed their investments.¹¹⁹¹ Treasury had also received \$11.5 billion in interest (for subordinated debt) and dividends (for preferred shares) and \$7.7 billion through the sale/repurchase of warrants.¹¹⁹² Treasury estimated that the CCP would result in a lifetime gain of nearly \$15 billion, roughly a 7.2% total return.¹¹⁹³ The positive return is mainly the result of Treasury's investments in the

¹¹⁸⁶ American Recovery and Reinvestment Act of 2009, *supra* note 1184, at 516-520.

¹¹⁸⁷ *Id.*

¹¹⁸⁸ See July SIGTARP Report, *supra* note 1168, at 77.

¹¹⁸⁹ See analysis *supra* Part II.B.2.b about the implicit guarantee built into the financial system after the Bear Stearns rescue.

¹¹⁹⁰ See OFFICE OF THE SPECIAL INSPECTOR GENERAL FOR THE TROUBLED ASSET RELIEF PROGRAM, QUARTERLY REPORT TO CONGRESS 79 (Apr. 25, 2012) [hereinafter April SIGTARP Report].

¹¹⁹¹ July SIGTARP Report, *supra* note 1168, at 77.

¹¹⁹² April SIGTARP Report, *supra* note 1190, at 77.

¹¹⁹³ See U.S. DEP'T OF THE TREASURY, TROUBLED ASSET RELIEF PROGRAM MONTHLY REPORT TO CONGRESS – MAY 2012, at 4 (June 11, 2012), <http://www.treasury.gov/initiatives/financial-stability/briefing-room/reports/105/Documents105/May%202012%20Monthly%20Report%20to%20Congress.pdf>.

largest banks with assets of more than \$10 billion or greater. Its investments in banks with assets of less than \$10 billion are likely to result in a loss of \$4.4 billion.¹¹⁹⁴

Other capital injection programs under TARP have also fared relatively well. Overall these programs (i.e., the bailout part of the program, including CPP and investments in AIG, Citigroup and Bank of America) would not cost any taxpayer dollars, according to Treasury estimates. The final cost of TARP is only likely to be in the range of \$25-50 billion, resulting mainly from the bailout of the auto industry and mortgage modification programs.¹¹⁹⁵

c. General Criticisms of Bailout Efforts and TARP

We now turn to five general criticisms of government bailout efforts and use the implementation of TARP as illustrations: (1) taxpayers may suffer losses; (2) bailouts may not work or may be prolonged; (3) bailouts create moral hazard; (4) government decisions over bailout may be political and ad hoc; and (5) bailouts may fail to boost lending activities.

i. Taxpayers May Suffer Losses

Historically, bailouts have had varying impact on taxpayers. The RFC during the Great Depression had a cumulative profit of \$160 million on its capital of \$500 million.¹¹⁹⁶ However, the bailout of Continental Illinois National Bank eventually cost the FDIC \$1.1 billion¹¹⁹⁷ and taxpayers paid for “\$123.8 billion, or 81 percent of the total costs” of the savings and loans crisis.¹¹⁹⁸ As discussed above, TARP’s bank bailout programs will not result in any tax dollar loss, indeed they will be profitable, but the government will likely suffer losses on its mortgage modification programs and auto industry bailouts.

Even though bailouts may, in the end, not be costly for taxpayers, one does not know this in advance of the expenditure. At the time TARP was authorized by the Congress, the estimated

¹¹⁹⁴ *Id.*

¹¹⁹⁵ See Timothy Massad, *Written Testimony Before Congressional Oversight Panel 2* (Mar. 2011).

¹¹⁹⁶ See Pollock, *supra* note 1143, at 6.

¹¹⁹⁷ See FED. DEPOSIT INS. CORP., *MANAGING THE CRISIS: THE FDIC AND RTC EXPERIENCE* 558 (1998), <http://www.fdic.gov/bank/historical/managing/history2-04.pdf>.

¹¹⁹⁸ See Timothy Curry & Lynn Shibut, *The Cost of the Savings and Loan Crisis: Truth and Consequences*, 13 FDIC BANKING REV. 26, 33 (2000), http://www.fdic.gov/bank/analytical/banking/2000dec/brv13n2_2.pdf.

cost to taxpayers was much higher.¹¹⁹⁹ On the other hand, if the objective is to avoid taxpayer losses, one can provide that financial institutions or their investors—or some subset of them—bear any eventual losses through ex post assessments. Section 134 of the Emergency Economic Stabilization Act of 2008, which authorizes TARP, provides that the President shall submit a legislative proposal that recoups from the financial industry an amount equal to the shortfall of TARP to ensure that the bailout does not add to the deficit or national debt.¹²⁰⁰ Pursuant to this Section 134, President Obama has proposed the “Financial Crisis Responsibility Fee,” which would be imposed on certain financial institutions with \$50 billion or more in consolidated assets.¹²⁰¹ The President included this fee in his budget proposal for fiscal year 2013, aiming to collect roughly \$61 billion in such fees over a 10-year period.¹²⁰² However, this budget has yet to be approved by either house of Congress.

At the request of G-20 leaders, the IMF in June 2010 also proposed two alternatives to shift the burdens associated with government interventions to the financial sector: (1) a financial stability contribution levied upon financial institutions based on certain attributes such as size and riskiness; or (2) a financial activities tax based on bank profits.¹²⁰³

The plan to impose a global tax was subsequently shelved but various European countries have considered similar national legislation.¹²⁰⁴ In September 2011 the European Commission also proposed a Europe-wide financial transaction tax (FTT).¹²⁰⁵ In May 2012 the European Parliament passed the FTT, although many member states with a veto on tax issues, including

¹¹⁹⁹ See Massad, *supra* note 1195, at 2.

¹²⁰⁰ Pub. L. 110-343, § 134, 122 Stat. 3765, 3798.

¹²⁰¹ See Press Release, The White House, President Obama Proposes Financial Crisis Responsibility Fee to Recoup Every Last Penny for American Taxpayers (Jan. 14, 2010), <http://www.whitehouse.gov/the-press-office/president-obama-proposes-financial-crisis-responsibility-fee-recoup-every-last-penn>.

¹²⁰² See OFFICE OF MGMT. & BUDGET, FISCAL YEAR 2013 BUDGET OF THE U.S. GOV'T (Feb. 13, 2012), <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2013/assets/budget.pdf>.

¹²⁰³ See INT'L MONETARY FUND, A FAIR AND SUBSTANTIAL CONTRIBUTION BY THE FINANCIAL SECTOR: FINAL REPORT FOR THE G-20 (June 2010), <http://www.imf.org/external/np/g20/pdf/062710b.pdf>.

¹²⁰⁴ See HAL SCOTT, FINANCIAL CRISIS RESPONSIBILITY FEE: ISSUES FOR POLICY MAKERS (2010), <http://www.uschamber.com/sites/default/files/reports/FinancialCrisisResponsibilityFee2010.pdf>.

¹²⁰⁵ See Press Release, Eur. Comm'n, Financial Transaction Tax: Making the Financial Sector Pay Its Fair Share (Sept. 28, 2011), <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/1085&format=HTML&aged=0&language=EN&guiLanguage=en>.

the U.K. and Sweden, are expected to exercise their right to veto the FTT.¹²⁰⁶ The imposition of such a “Tobin tax” would supposedly curb what some see as useless financial activities. The proceeds from the FTT, which has received support from French and German leaders but staunch opposition from the U.K.,¹²⁰⁷ will be used to compensate European governments for rescue costs during the financial crisis, but also, more generally, to “contribute to the public finances” during the ongoing European fiscal crisis.¹²⁰⁸ The FTT has also been justified as a form of compensation for an implicit state guarantee, a roughly-fashioned (but explicit) premium for an implicit bailout guarantee.¹²⁰⁹ However, the FTT is poorly designed for this purpose, because it taxes all financial transactions indiscriminately, rather than charging those firms that are most likely to be bailed out, based either on their size or the riskiness of their activities.¹²¹⁰

There are several concerns with the ex post tax assessment approach to pay for bailouts. First, it is hard to determine how such ex post assessments should be apportioned, e.g., to banks and non-banks.¹²¹¹ The challenges are essentially the same as those for an insurance regime funded through ex post assessments, which are discussed under Part II(B)(2)(c) above. Second, failing global coordination, banks may be subject to double or even triple taxation.¹²¹² Third, there is some concern that such taxes could turn out to be politically unenforceable when the financial crisis is over, but taxpayers should blame politicians and not banks for that outcome.¹²¹³ Finally, there is the fear that the government could use the opportunity to overtax the banks, as the E.U. financial transactions tax proposal arguably demonstrates.

ii. Bailouts May Not Work or Be Prolonged

Before the financial crisis, the most successful bailout in mature economies was the Swedish bank bailout in the early 1990s. The collapse of the property market left several

¹²⁰⁶ *MEPs Back Financial Transaction Tax*, EURONEWS, May 23, 2012,

<http://www.euronews.com/2012/05/23/meps-back-financial-transaction-tax/>.

¹²⁰⁷ George Parker & Quentin Peel, *Germany Rebukes UK Over Tobin Tax Opposition*, FIN. TIMES, Nov. 15, 2011.

¹²⁰⁸ Eur. Comm’n, *supra* note 1205.

¹²⁰⁹ John Vella, et al., *The EU Commission’s Proposal for a Financial Transactions Tax* 8-9 (Draft prepared for BRIT. TAX REV., Nov. 8, 2011),

<http://www.sbs.ox.ac.uk/centres/tax/Documents/JV%20CF%20TS%20Nov%202011.pdf>.

¹²¹⁰ *Id.*

¹²¹¹ Jackie Calmes, *Obama Weighs Tax on Banks to Cut Deficit*, N.Y. TIMES, Jan. 11, 2010.

¹²¹² See HAL SCOTT, FINANCIAL CRISIS RESPONSIBILITY FEE: ISSUES FOR POLICY MAKERS, *supra* note 1204, at 9.

¹²¹³ See Pollock, *supra* note 1143, at 7.

Swedish banks with large quantities of soured real estate loans. The government announced a blanket guarantee of bank debt and took over the major banks. Sweden eventually incurred minimum cost after selling its bank interests several years later.¹²¹⁴ However, bailout does not always work. It may carry the risk that one bailout will evolve into multiple efforts to prop up insolvent banks for an extended period of time without any real hope of recovery.

The Japanese “lost decade” is a prominent example of a prolonged bailout. Until very recently, large and small Japanese banks have been saddled with bad loans since the collapse of its stock and real property markets in 1990.¹²¹⁵ Through 1990s, the government purchased non-performing loans (NPL) from banks and tried other rescue measures. However, it continued to delay in recognizing the full scale of the NPL problem by endorsing questionable accounting practices due to the high social cost that would follow from corporate bankruptcies.¹²¹⁶ In 1998, when the level of NPL became extremely high, the government purchased 1.8 trillion yen (\$16 billion) in subordinated debt and preferred shares in 21 major banks that were undercapitalized. The bailout failed to stabilize the market and the government nationalized two major banks, the Long-Term Credit Bank of Japan and Nippon Credit Bank, followed by another injection of 7.5 trillion yen (\$71 billion) in 15 banks the next year.¹²¹⁷ Bailouts continued thereafter, including the injection of 1.96 trillion yen in Resona in 2003. The government also consolidated the biggest banks during this period to create some of the largest banks in the world. Some consolidations were shotgun marriages, such as the creation of Resona through the merger of Daiwa Bank and Asahi Bank.¹²¹⁸

To be clear, the 1998 recapitalization was effective in calming the financial market and credit started to flow thereafter, as the market perceived that the government would not allow

¹²¹⁴ See Bo Lundgren, *Testimony of Bo Lundgren, Director General, Swedish National Debt Office before the Congressional Oversight Panel* (Mar. 19, 2009), <http://cybercemetery.unt.edu/archive/cop/20110401231927/http://cop.senate.gov/documents/testimony-031909-lundgren.pdf>.

¹²¹⁵ See SCOTT & GELPERN, *supra* note 372, at 427-28.

¹²¹⁶ *Id.* at 432-38.

¹²¹⁷ See CONG. OVERSIGHT PANEL, APRIL OVERSIGHT REPORT 56-59 (Apr. 7, 2009),

<http://cybercemetery.unt.edu/archive/cop/20110401232137/http://cop.senate.gov/documents/cop-040709-report.pdf>.

¹²¹⁸ See SCOTT & GELPERN, *supra* note 372, at 443.

any big banks to fail.¹²¹⁹ However, the NPL problem persisted. Failed corporations continued to be propped up by banks and the good money doled out by the government eventually turned into new bad loans.¹²²⁰ Even after multiple injections and consolidations, many Japanese banks, especially regional ones, were still thinly capitalized. At the end of March 2002, Japanese banks collectively had a core capital adequacy of 4%. One third of the core capital, however, was in the form of deferred tax assets—tax deductions based on past loan losses that could only be claimed when banks become profitable.¹²²¹ Many still carried excessive amounts of non-performing loans due to regulatory forbearance.¹²²²

The Japanese financial system finally began to stabilize after its economy started to recover and the government began to address the NPL problem seriously around 2003.¹²²³ By 2006, banks appeared to be able to repay public funds within a few years. The largest ones have already done so (except Resona, which has a target date of late 2015, but is on track to repay earlier)¹²²⁴ but regional banks continue to struggle.¹²²⁵ Some nationalized banks were sold to nonbanking and foreign owners.¹²²⁶

The Japanese experience demonstrates that fundamental problems with banking practices may only be prolonged, but not resolved, through bailouts. Bailouts may be the beginning and not the end of financial recovery. The Congressional Oversight Panel in early 2009 agreed that CPP and other bank investment programs would work based on the key assumption that the financial crisis was in large part the product of temporary liquidity constraints resulting from nonfunctioning markets for troubled assets.¹²²⁷ In other words, bailouts should only be used to curb risk contagion and stabilize the market so that the government could have breathing time to

¹²¹⁹ See Takeo Hoshi & Anil Kashyap, *Will the U.S. Bank Recapitalization Succeed? Eight Lessons from Japan*, 97 J. FIN. ECON. 398, 401 (2010).

¹²²⁰ See CONG. OVERSIGHT PANEL, *supra* note 1217, at 56-59.

¹²²¹ See Hoshi & Kashyap, *supra* note 1219, at 401.

¹²²² *Id.*

¹²²³ *Id.*

¹²²⁴ See Shigeru Sato & Takako Taniguchi, *Resona Chief Higaki Pledges To Repay Bailout Money Ahead Of Plan*, BLOOMBERG, May 17, 2012, <http://www.bloomberg.com/news/2012-05-17/resona-chief-higaki-pledges-to-repay-bailout-money-ahead-of-plan.html>.

¹²²⁵ See SCOTT & GELPERN, *supra* note 372, at 447.

¹²²⁶ *Id.* at 448-49.

¹²²⁷ See CONG. OVERSIGHT PANEL, *supra* note 1217, at 11.

implement *other* cleanup efforts such as proactive write-downs, reform of banking practices and gradual sales of assets.

iii. Creation of Moral Hazard

The fear of moral hazard is the strongest argument against government bailouts. Both individual firms and the market may have perverse incentives if they know the government will come to the rescue. Firms will take on more risks than necessary because risk-taking becomes a one-sided bet.¹²²⁸ Investors, especially debt investors, may have less incentive to monitor the performance of the firm. As the firm becomes too-big-to-fail, i.e., presumptively entitled to a bailout, it may also enjoy an unfair competitive advantage over other firms because its cost of financing could be cheaper.¹²²⁹ These concerns are similar to the ones regarding insurance or guarantees.

Summers identifies an excessive fear of moral hazard among a group he calls “moral hazard fundamentalists,” and suggests these fundamentalists are misguided in three respects as they analogize the moral hazard of bailout to the moral hazards raised by insurance: first, individual actors in the financial world may underestimate the role of contagion and the benefits that their own insurance will have on other actors; thus, they will tend to under-insure (suggesting the free market may not be an adequate way to address the risks they pose). Second, institutions may fail simply because of a loss of confidence, rather than because of increased risk-taking. In these cases, the possibility of bailout can help to avoid panic and contagion. Finally, unlike insurance, bailout can actually leave taxpayers better off, for example when a government program like TARP is potentially profitable. For all these reasons, policy should not be developed simply on the basis of “avoiding moral hazard,” but rather must take into account contagion, potential liquidity runs and the benefits of quelling panic, and the potential costs and benefits of a bailout to taxpayers.¹²³⁰

¹²²⁸ See Calomiris, *supra* note 467, at 3.

¹²²⁹ See Joseph Stiglitz, *Witness Testimony of Joseph Stiglitz, Congressional Oversight Panel Hearing on Impact of the TARP on Financial Stability* 4 (Mar. 2011), <http://cybercemetery.unt.edu/archive/cop/20110401223036/http://cop.senate.gov/documents/testimony-030411-stiglitz.pdf>.

¹²³⁰ See Lawrence Summers, *Beware Moral Hazard Fundamentalists*, FIN. TIMES, Sept. 23, 2007.

Although the moral hazard risk may not be eliminated, bailouts can be structured in ways to reduce the risk.¹²³¹ First, the government can offer to bailout a troubled financial institution only on the rarest of occasions, therefore, reducing the expectation that a bailout is necessarily available.¹²³² As a related point, there can be constructive ambiguity about whether any bailout will be forthcoming, a policy long adopted in the context of lender of last resort.¹²³³ In addition, because bailout is often a political decision, a financial institution may not know in advance whether the politics will work in its favor. Bailouts should only be done when the alternative of contagion and economic collapse is the worse alternative. Thus, no bank should be too-big-too fail, absent concern for contagious effects.

Second, government bailouts, either in the form of preferred or common stock, usually do and should wipe out existing common shareholders. They could also be combined with some hit on longer-term creditors, e.g., through bail-ins, as discussed in the resolution section of this paper. These longer-term creditors should, therefore, have incentive to monitor risk.¹²³⁴ Indeed, since bond losses are tightly linked to their rating changes and rating agencies are usually not certain that bailouts will occur, they may downgrade the banks in trouble out of caution. As a result, creditors will suffer an immediate loss. Rating agencies obviously consider implicit government backing in its rating decisions. In September 2011, Moody's downgraded Citigroup, Bank of America and Wells Fargo as it believed that the government was less likely to assist these banks going forward than during the financial crisis, when contagion risk was high.¹²³⁵ In addition, Moody's also considered the enactment of Dodd-Frank Act as showing the government's intent to impose losses on bondholders in future crises.¹²³⁶ Most recently, citing the "clear intent of government around the world to reduce support for creditors," Moody's

¹²³¹ See Calomiris, *supra* note 467, at 3.

¹²³² *Id.* at 3-4.

¹²³³ See Xavier Freixas et al., *Lender of Last Resort: A Review of the Literature*, FIN. STABILITY REV., Nov. 1999, at 151, 160-61, <http://www.bankofengland.co.uk/publications/fsr/1999/fsr07art6.pdf>.

¹²³⁴ See, e.g., Ayotte & Skeel, *supra* note 13, at 486.

¹²³⁵ Moody's, *Moody's Downgrades Citigroup Inc to P-2; Citibank Prime-1 Affirmed; All Long-Term Senior Ratings Confirmed*, Sept. 21, 2011, http://www.moody's.com/research/Moodys-downgrades-Citigroup-Inc-to-P-2-Citibank-Prime-1--PR_226520; Moody's, *Moody's Downgrades Wells Fargo & Company Rating*, Sept. 21, 2011, http://www.moody's.com/research/Moodys-downgrades-Wells-Fargo-Company-rating-sr-to-A2-P--PR_226518; Moody's, *Moody's Downgrades Bank of America Corp. to Baa1/P-2; Bank of America N.A. to A2, P-1 Affirmed*, Sept. 21, 2011, http://www.moody's.com/research/Moodys-downgrades-Bank-of-America-Corp-to-Baa1P-2-Bank--PR_226511.

¹²³⁶ *Id.*

downgraded five of the six largest U.S. banks: JPMorgan, Bank of America, Citigroup, Goldman Sachs, and Morgan Stanley.¹²³⁷

Bernardo, Talley, and Welch, using a model that focuses exclusively on moral hazard, show that bailouts can be welfare-enhancing if (1) they are only used sparingly, where social externalities are large and subsidies are small; (2) the government eliminates incumbent owners, board and managers to improve *a priori* incentives; and (3) the bailout is funded through redistributive taxes on healthy firms rather than forcing recipients to repay in the future, as the government has already fully expropriated existing owners and managers.¹²³⁸ With regard to the problem that bank managers may take excessive risks in exchange for large bonuses and then leave before the ship sinks, even a no-bailout rule could not correct the problem and the solution may lie elsewhere, such as compensation reforms and clawback requirements.

However, moral hazard will not be completely eliminated through properly designed bailout policies. For example, when a firm is in the zone of bankruptcy, shareholders and managers may have incentives to incur excessive debt in the hope of a turnaround. The possibility of any government bailout and the subsequent dilution or elimination of equity could make it more difficult for a distressed firm with a debt overhang problem to attract new equity and create more need for last-minute government rescues.¹²³⁹

iv. Bailout Decisions May Be Political and Ad Hoc

Some have claimed that the use of TARP funds was often determined based on political rather than actual systemic risk grounds.¹²⁴⁰ One prominent example was the bailout of GMAC, which showed that the presence of systemic risk was not a condition for doling out public assistance since GMAC's rescue had nothing to do with mitigating the financial crisis.¹²⁴¹ Some claim that some companies are simply "too-connected-to-fail" due to their executives' extensive

¹²³⁷ Moody's, *Moody's downgrades firms with global capital markets operations*, June 21, 2012, http://www.moodys.com/research/Moodys-downgrades-firms-with-global-capital-markets-operations--PR_248989.

¹²³⁸ See Bernardo et al., *supra* note 1138, at 4-5.

¹²³⁹ *Id.*

¹²⁴⁰ See Stiglitz, *supra* note 1229, at 3.

¹²⁴¹ See Calomiris, *supra* note 467, at 5.

connections with the key decision-makers within the federal government.¹²⁴² Further, the assistance given to small banks under TARP had little to do with concern with systemic risk.

Public confidence in the bailout effort can be seriously damaged if it is perceived by the public that the government did not follow any clearly articulated goals and principles in making important decisions.¹²⁴³ This was particularly the case in the pre-TARP period. Bailouts often seemed to be ad hoc responses to an impending crisis—“when a major financial institution got into trouble, the Treasury Department and the Federal Reserve would engineer a bailout over the weekend and announce that everything was fine on Monday.”¹²⁴⁴

v. Bailouts May Fail to Boost Lending Activities

Bailout efforts often serve the twin purposes of stabilizing the financial system and alleviating the adverse impacts on the real economy caused by the collapse of the lending market. Obviously there is some inherent tension between the two purposes—if the financial system fails largely due to the failure of businesses in the real economy, as in the case of Japan, extending credit to these failed businesses would simply generate new bad debt. However, if the real economy could have maintained its good shape under normal lending conditions and the crisis is caused by a failure within the financial system itself, as many consider to be the case in the recent crisis, a government bailout of the financial system should increase business lending, grow the real economy, boost the financial performance of the banks and in turn facilitate the government’s exit from its investments.

Although general lending conditions have significantly improved since the peak of the financial crisis in 2008, many believe that TARP has failed to revive the real economy. To start, critics of TARP often point to the flaw in CPP’s design. When the U.K. government made equity investments in RBS and Lloyds, there were explicit contractual requirements that they maintain their level of lending at pre-crisis levels.¹²⁴⁵ On the contrary, no similar requirement was

¹²⁴² See Simon Johnson, *Testimony Submitted to the Congressional Oversight Panel 3* (Nov. 2009), <http://cybercemetery.unt.edu/archive/cop/20110401231809/http://cop.senate.gov/documents/testimony-111909-johnson.pdf>.

¹²⁴³ See Calomiris, *supra* note 467, at 16.

¹²⁴⁴ See Johnson, *supra* note 1242, at 6.

¹²⁴⁵ See, e.g., Press Release, Royal Bank of Scotland, *supra* note 1147.

imposed by U.S. Treasury for CPP participants. To be fair, the FDIC has instead instructed the banks it regulates to monitor the use of TARP funds as well as the use of money raised with FDIC debt guarantees.¹²⁴⁶ In addition an interagency statement urges all banking organizations to make loans to creditworthy borrowers.¹²⁴⁷

Treasury was also faulted for failing to implement proper measures to monitor the actual use of TARP funds, prompting COP to repeatedly ask Treasury where the money went.¹²⁴⁸ Treasury's response was that money was fungible so it was impossible to correlate the TARP funds with specific uses of funds.¹²⁴⁹ As pointed out by the Panel, Treasury's claims were challenged by a survey of the Special Inspector General for the Troubled Asset Relief Program (SIGTARP) demonstrating that banks could provide meaningful information on their use of TARP funds without much difficulty.¹²⁵⁰ The Panel also pointed out that some banks voluntarily disclosed information on the use of their TARP funds in public filings.¹²⁵¹

Several studies claim that the CPP has not achieved increasing credit origination. Using loan-level data on 25 million mortgage loans and 28 thousand corporate loans, Duchin and Sosyura found "no evidence of greater credit origination by [CPP] participants relative to nonparticipants with similar characteristics" in both retail and commercial lending activities.¹²⁵² In addition, the authors found that CPP participants tended to approve riskier loans and invest in riskier securities within the same asset class (hence enjoying the same risk-weighted capital ratio) than non-CPP participants. The behavior might be explained by the participants' intent to boost performance without eroding their capital bases. A study by Black and Hazelwood using

¹²⁴⁶ Fed. Deposit Ins. Corp., Financial Institution Letters, Monitoring the Use of Funding from Federal Financial Stability and Guaranty Programs, FIL-1-2009 (Jan. 12, 2009), <http://www.fdic.gov/news/news/financial/2009/fil09001.html>.

¹²⁴⁷ Press Release, Bd. of Governors of the Fed. Reserve Sys., Federal Deposit Ins. Corporation, Office of the Comptroller of the Currency and Office of Thrift Supervision, Interagency Statement on Meeting the Needs of Creditworthy Borrowers (Nov. 12, 2008), <http://www.federalreserve.gov/newsevents/press/bcreg/20081112a.htm>.

¹²⁴⁸ See CONG. OVERSIGHT PANEL, DECEMBER OVERSIGHT REPORT, *supra* note 1151, at 108.

¹²⁴⁹ *Id.* at 109.

¹²⁵⁰ *Id.*

¹²⁵¹ *Id.* at 110-11.

¹²⁵² See Ran Duchin & Denis Sosyura, *TARP Consequences: Lending and Risk Taking*, <http://apps.olin.wustl.edu/firs/pdf/2011/2119.pdf>. See also Ran Duchin et al., Riskier Portfolios: Banks Response to Government Aid, http://deepblue.lib.umich.edu/bitstream/2027.42/86216/4/1165_Sosyura_B.pdf.

different data also found no evidence of greater credit origination by CPP participants.¹²⁵³ They, however, found that only large CPP recipient banks increased their risk profile after CPP investments while small banks decreased the riskiness of their assets.

Two lending markets remain in trouble to date. First, the mortgage market is still on life support. Approximately 90% of all mortgage originations and 99% of all securitizations are now guaranteed by the government.¹²⁵⁴ The private securitization market still remains dormant. The Department of Housing and Urban Development's latest report on housing market conditions states that indicators "continue to portray a fragile recovery in the housing market."¹²⁵⁵ "The national home ownership rate," along with home values, declined in the first quarter of 2012.¹²⁵⁶ However, the delinquency rate for all mortgages has decreased back to 2008 levels.¹²⁵⁷

Similarly, small business lending remains inadequate. Lending is at best only recovering to "what it was four years ago."¹²⁵⁸ A large number of smaller and regional banks are still in trouble: 140 went bankrupt in 2009, 157 in 2010, and 92 in 2011, while 772 banks are on the FDIC's problem list—the same level as in 2009.¹²⁵⁹ One study shows that 60% of small business loan applications were rejected in 2011.¹²⁶⁰ Treasury announced in July 2011 the Small Business Lending Fund (SBLF), which was created outside TARP to inject capital into small community banks so that they could extend credit to small businesses (*i.e.*, the same theory underlying the CPP).¹²⁶¹ However, more than one third of the 332 recipients simply used all or part of the

¹²⁵³ See Lamont Black & Lieu Hazelwood, *The Effect of TARP on Bank Risk-Taking* (Sept. 2011), http://www.fdic.gov/bank/analytical/cfr/2011/sept/BRC_2011_69_Black.pdf.

¹²⁵⁴ Peter J. Wallison, *Testimony to House Financial Services Committee Subcommittee on Capital Market and Government Sponsored Enterprises*, Nov. 3, 2011, <http://www.aei.org/docLib/Private-Securitization-of-Mortgages.pdf>.

¹²⁵⁵ See U.S. Dep't of Housing & Urban Development, *U.S. Housing Market Conditions, 1st Quarter 2012*, at 1, http://www.huduser.org/portal/periodicals/ushmc/spring12/USHMC_1q12_summary.pdf.

¹²⁵⁶ *Id.*

¹²⁵⁷ *Id.*

¹²⁵⁸ See Stiglitz, *supra* note 1229, at 2.

¹²⁵⁹ FED. DEPOSIT INS. CORP., FDIC QUARTERLY BANKING PROFILE: FIRST QUARTER 2012, AT 4 (2012), http://www.fdic.gov/bank/analytical/quarterly/2012_vol6_2/FDIC_Quarterly_Vol6No2.pdf; FED. DEPOSIT INS. CORP., STATISTICS AT A GLANCE: MARCH 2012 STATISTICS (Mar. 31, 2012), <http://www.fdic.gov/bank/statistical/stats/2012mar/industry.pdf>.

¹²⁶⁰ See Emily Maltby & Angus Loten, *Tale of Two Loan Programs*, WALL ST. J., Oct. 20, 2011.

¹²⁶¹ See Press Release, U.S. Dep't of the Treasury, Treasury Kicks Off Billions Of Dollars In Main Street Lending Through The Small Business Lending Fund, <http://www.treasury.gov/press-center/press-releases/Pages/tg1234.aspx>.

funding received under SBLF to repay their CPP investments. In total, more than half of the \$4 billion funding under SBLF was so used.¹²⁶²

d. Specific Criticisms of TARP

In addition to the general criticisms above, it is suggested that TARP as a bailout plan could be improved in certain aspects.

i. Favorable Terms for CPP Participants

All CPP recipients received government funds on the same terms, and the terms were criticized for being too favorable. As the Congressional Oversight Panel's February 2009 report pointed out, the valuation firm hired by the Panel, Duff & Phelps, found that of the \$184 billion in TARP funds that it analyzed, the securities that Treasury received in exchange had a market value of only \$122 billion, or 66% of its face value.¹²⁶³ Similar results were found by another study by the Congressional Budget Office.¹²⁶⁴ There was also a short-lived criticism from the Panel that in some early exits Treasury again did not receive adequate compensation for the warrants that it received for its investments.¹²⁶⁵ The Panel, however, acknowledged in a later report that the prices for subsequent sales or redemptions were very close to its own estimate.¹²⁶⁶ SIGTARP also found separately that the government received a fair price for most of the warrants.¹²⁶⁷

Treasury designed the terms for the CCP to be favorable for the banks to increase their capital base. Further, it did not want to signal which banks were worse off by differentiation of its terms—this was an extension of its policy requiring the nine initial recipients to take funds

¹²⁶² See Maltby & Loten, *supra* note 1260.

¹²⁶³ See CONG. OVERSIGHT PANEL, FEBRUARY OVERSIGHT REPORT 27, Feb. 6, 2009, <http://cybercemetery.unt.edu/archive/cop/20110401232131/http://cop.senate.gov/documents/cop-020609-report.pdf>.

¹²⁶⁴ See CONG. BUDGET OFFICE, THE TROUBLED ASSET RELIEF PROGRAM: REPORT ON TRANSACTIONS THROUGH DECEMBER 31, 2008, at 1, Jan. 2009, <http://www.cbo.gov/ftpdocs/99xx/doc9961/01-16-TARP.pdf> (finding a subsidy of \$64 billion for transactions through Dec. 31, 2008).

¹²⁶⁵ See CONG. OVERSIGHT PANEL, JULY OVERSIGHT REPORT 26-27, Jul. 10, 2009, <http://cybercemetery.unt.edu/archive/cop/20110401232134/http://cop.senate.gov/documents/cop-071009-report.pdf>.

¹²⁶⁶ See CONG. OVERSIGHT PANEL, DECEMBER OVERSIGHT REPORT, *supra* note 1151, at 10.

¹²⁶⁷ See SIGTARP, ASSESSING TREASURY'S PROCESS TO SELL WARRANTS RECEIVED FROM TARP RECIPIENTS 1 (May 10, 2010), http://www.sig tarp.gov/reports/audit/2010/Assessing%20Treasury's%20Process%20to%20Sell%20Warrants%20Received%20From%20TARP%20Recipients_May_11_2010.pdf.

whether or not they were needed.¹²⁶⁸ This made it difficult, for example, to eliminate all equity claimants or to impose some losses on longer-term creditors. Treasury's main objective was to stabilize the banking system, not to make money. Further, Treasury acquired the ability in these deals to change the terms in the future, an option not valued in the Panel's analysis.¹²⁶⁹

ii. Interference with Firm Operations

As most of the largest banks exited CPP within a year of its implementation, discussions about potential excessive government interference in the day-to-day management of rescued firms concentrate on a few institutions such as Citigroup and AIG, in which the government held (US Treasury sold its final Citigroup shares in December 2010)¹²⁷⁰ or continues to hold (63% of AIG as of July 2012)¹²⁷¹ controlling equity interests. According to Treasury, it developed several core principles to guide its oversight including (1) acting as a reluctant shareholder; (2) not interfering in day-to-day management decisions; (3) ensuring a strong board of directors; and (4) exercising voting rights only in core areas.¹²⁷² However, many still criticized the government's involvement as excessive, especially the engagement of a "pay czar" to set compensation standards for key employees.¹²⁷³

Some experts have suggested that Treasury could have resolved the dilemma of acting both as a regulator and a controlling shareholder in its implementation of TARP by creating a separate corporation holding its TARP investments.¹²⁷⁴ The corporation would hire professional managers to manage the investments. The predominant strategy should be investment management, not politics.¹²⁷⁵ The corporation would report its holdings based on appropriate

¹²⁶⁸ See Mark Landler & Eric Dash, *Drama Behind a \$250 Billion Banking Deal*, N.Y. TIMES, Oct. 15, 2008.

¹²⁶⁹ See Hal Scott & Maxwell Jenkins, *The U.S. Treasury is a Public, Not a Private Investor*, FIN. TIMES, Mar. 2, 2009, <http://www.ft.com/cms/s/0/a57eaa72-073c-11de-9294-000077b07658.html>.

¹²⁷⁰ Tom Braithwaite & Francesco Guerrera, *US Treasury Sells Remaining Citi Shares*, FIN. TIMES, Dec. 7, 2010, <http://www.ft.com/intl/cms/s/0/f8d42e04-0181-11e0-9b29-00144feab49a.html#axzz1zpar28rW>.

¹²⁷¹ Press Release, U.S. Dep't of the Treasury, Overall Positive Return on \$182 Billion AIG Commitment during Financial Crisis Reaches \$15.1 Billion after Treasury Announces \$2.7 Billion in Additional Expected Proceeds from AIG Common Stock Sale (Sept. 11, 2012).

¹²⁷² See Herbert Allison, *Written Testimony for Domestic Policy Subcommittee of the Oversight and Government Reform Committee* 18-21 (Dec. 17, 2009), http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_house_hearings&docid=f:65131.pdf.

¹²⁷³ See, e.g., Rep. Jim Jordan, *Hearing of Committee on Oversight and Government Reform* 8 (Dec. 16, 2009), http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_house_hearings&docid=f:65130.pdf.

¹²⁷⁴ See Pollock, *supra* note 1143, at 3.

¹²⁷⁵ *Id.*

accounting standards.¹²⁷⁶ Commentators pointed to the example of RFC, which was an agency independent from Treasury.¹²⁷⁷ Another example would be the U.K. Financial Investments Limited, which was the separate vehicle holding and managing U.K. government's investments in Northern Rock, RBS and other firms receiving government bailout.¹²⁷⁸ The U.K. Treasury, however, have the final say on key issues and only leave routine decisions to the management of the holding company.¹²⁷⁹

iii. Lack of Enforcement of the CPP's Contractual Terms

While the largest banks have already repaid their TARP investments with interest, as of March 31, 2012, only 356 out of the 707 banks receiving CPP investments have exited the program, including 137 community banks that refinanced their CPP investments into Treasury investments under the newly established SBLF.¹²⁸⁰ In addition, 28 banks converted their CPP investments into investments under the Community Development Capital Initiative under TARP.¹²⁸¹ Most of the remaining firms are small banks and increasingly they are having difficulty to come up with dividend or interest payments. Some have already failed. According to SIGTARP in its April 2012 report, as of March 31, 2012, 200 banks had unpaid dividend or interest payments to Treasury totaling approximately \$416 million, an increase from 197 banks with an unpaid amount of \$377 million three months ago.¹²⁸²

Under the terms of CPP investments summarized above, if a participant misses six quarterly dividend (or interest) payments, Treasury has the right to appoint up to two additional members to the bank's board. Although by Treasury's own count, 101 banks had missed six or more dividend payments as of March 31, 2012 (up from 88 three months ago), it had only appointed directors to nine banks' boards.¹²⁸³ Instead, Treasury had requested banks with five or more missing payments to permit Treasury to appoint "observers," who are Treasury employees,

¹²⁷⁶ *Id.* at 4.

¹²⁷⁷ *Id.*

¹²⁷⁸ See UK FIN. INVESTMENTS LTD., UKFI SHAREHOLDER RELATIONSHIP FRAMEWORK DOCUMENT (Jan. 2010), http://www.ukfi.co.uk/releases/UKFI_FD_180110v2.pdf.

¹²⁷⁹ *Id.*

¹²⁸⁰ See April SIGTARP Report, *supra* note 1190, at 78.

¹²⁸¹ *Id.*

¹²⁸² *Id.* at 86.

¹²⁸³ *Id.* at 86-88.

to these banks.¹²⁸⁴ Treasury prefers to use observers as it points out that selection of board members requires a significant investment of resources while an observer could immediately help Treasury collect information about the bank in question.¹²⁸⁵

iv. Comparisons with Foreign Bailout Efforts

As already alluded to above, critics have suggested that TARP should have incorporated various mechanisms adopted by foreign governments in their bailout measures, such as the imposition of lending restrictions on banks bailed out by the U.K. government. Efforts have also been made to find the “perfect” bailout model, or at least one that is better than TARP.

One example widely discussed during the financial crisis is the Swedish banking bailout in the early 1990s. The Swedish bailout adopted a typical “good bank-bad bank” approach and was not noteworthy in terms of techniques.¹²⁸⁶ However, the Congressional Oversight Panel has noted two aspects of the Swedish bailout: maximum transparency and independence.¹²⁸⁷ The Swedish government created an entity separate from its existing financial regulators to oversee the bailout efforts and granted it both political and financial independence. The bailout authority then required the banks in trouble to open their books and conducted audits to assess their potential capital needs.¹²⁸⁸ TARP obviously deserves some of the criticisms for the initial confusion created by the Treasury’s change of heart and by the identical terms imposed on CPP recipients. It needs, however, to be noted that the Swedish bailout was addressing a contained crisis in a small country during a period of global economic stability. Sweden also had more time to design and implement its bailout as the government had already put a blanket guarantee on all deposits. TARP, on the other hand, was created at the height of the financial crisis to curb further contagious effects on the global financial system.

¹²⁸⁴ See U.S. Dep’t of the Treasury, *Capital Purchase Program: Nomination of Board Observers and Directors*, <http://www.treasury.gov/initiatives/financial-stability/programs/investment-programs/cpp/Documents/PPP%20Directors%20-%20Observer%20Fact%20Sheet.pdf>.

¹²⁸⁵ *Id.*

¹²⁸⁶ See CONG. OVERSIGHT PANEL, APRIL OVERSIGHT REPORT, Apr. 7, 2009, at 51-54, <http://cybercemetery.unt.edu/archive/cop/20110401232137/http://cop.senate.gov/documents/cop-040709-report.pdf>.

¹²⁸⁷ *Id.* at 54-55.

¹²⁸⁸ *Id.*

Legislative bodies in many countries aside from the U.S. introduced recapitalization measures during 2008 and 2009.¹²⁸⁹ As seen in Figure 2.18, the U.S. CPP is the largest program in absolute amounts (\$250 billion in commitments versus \$107 billion for second-ranked Germany); but as a percentage of GDP, the program is more modest. The Netherlands has the largest exposure with 4.3% of GDP committed, while the U.S. with 1.8% committed ranks at the bottom, also below Ireland (3.8%), the U.K. (3.5%), Germany (3.2%), and France (2.0%). In terms of participation, the U.S. CPP has the largest number of beneficiaries with 707 recipients compared to 18 recipients of the European programs combined. The sheer size of the U.S. CPP is due to the program's openness to any U.S. financial institution, whether systemically important or not.¹²⁹⁰ However, participation as a percentage of total assets in the banking system is highest in France (92.6%), followed by the U.S. (75.8%), Ireland (74.2%), the Netherlands (65.9%), the U.K. (34.1%), and Germany (18.5%). The option for large banks to opt out of the programs in the U.K. (Barclays PLC) and Germany (Deutsche Bank) explains the large contrast in participation rates.¹²⁹¹

¹²⁸⁹ For a comprehensive list of recapitalization programs, see Da Lin, *Lessons for Tarp from Abroad: A Survey of Recent Recapitalization Programs*, at Appendix I, May 2, 2012, <http://www.law.harvard.edu/programs/about/pifs/symposia/brazil/da-lin.pdf>.

¹²⁹⁰ *Id.* at 19.

¹²⁹¹ *Id.* at 20.

Figure 2.18¹²⁹²

Program	Amount Committed ¹		Outlay (\$ bn) ¹	Recipients		Instrument	Dividend/Interest rate	Covenants and Restrictions						
	Total (\$ bn)	% GDP (2008) ²		#	% Asset ³			Exec Comp	Ordinary dividend ban ⁴	Board of Directors appointment	Required Lending	Required Restructuring		
U.S. (TARP)														
CPP ⁵	\$250	1.8	\$204.9 (16.42)	707 (352)	75.8	NCP, Warrants	Initial: 5%, 5 yrs: 9%	✓		✓ ⁶				
TIP	--	--	\$40 (0)	2 (0)	--	NCP, Warrants	8%,	✓	✓					
SSFI	\$70	0.05	\$48 (35.85)	1 (1)	--	NCP, Warrants	10%	✓	✓	✓				
U.K. (GRS)	\$86.5	3.5	\$113.84 (113.84)	2 (2)	34.1	NCP, Common	Initial: 12%, 5 yrs: LIBOR +7%	✓	✓	✓	✓		✓	✓
Germany (SoFFin)	\$107	3.2	\$40.28 (\$27.5)	(4) (4)	18.5	Silent Participation	Average 9–10% + dividend-linked rate ⁷	✓	✓		✓		✓	✓
France (SPPE)	\$55	2	\$28.53 (0)	6 ⁸ (0)	92.6	NCP, or TSS securities	Initial: average 8% 5 yrs: CDS-linked rate ⁹	✓			✓			
Ireland	\$9.63	3.8	\$14.71 (2)	3 (3)	74.2	NCP, Warrants	8%	✓	✓	✓	✓		✓	✓
Netherlands	\$27.5	4.3	\$18.9 (5.16)	3 (2)	65.9	Convertible securities	Dividend-linked, ¹⁰ w/ floor of 8.5%	✓	✓	✓				✓
Japan														
1998 Financial Functions Stabilization Act	\$157.3	2.6	\$21.97 (2.3)	21 (2)	--	Mostly subordinated debt.	Varied. Average LIBOR+1.15% (SD) for first 5 years.							
1999 Early Strengthening Act	\$302.5	5	\$104.12 (8.42)	32 (5)	--	Varied ¹¹	Varied. Average 1% (CP) or LIBOR+1% (SD) before step-up date.				✓		✓	

Sources: Bankscope; European Commission State Aid cases; OECD; Communication with Takeshi Kohira, Japanese Financial Services Agency.

1. Converted using October 2008 exchange rate. Japanese programs were converted using the March 1998 and March 1999 exchange rates, respectively.

2. The percentages for the Japanese programs were converted using the 1998 and 1999 GDP, respectively.

3. Percent of total banking assets in program, calculated using data from approximately 12/31/2008.

4. Includes "effective" ban on dividends. For example, the TIP limited dividends to \$0.01, and the SSFI prevented AIG from increasing its dividends from \$0 for five years.

5. This chart summarizes the CPP terms for public institutions. Terms for public, private, S-corporation, and mutual banks were slightly different.

6. Only effective after nonpayment of dividends for six quarterly periods (whether or not consecutive).

7. For each €4.4 million in dividends (€5.9 million in the second Commerzbank tranche), interest rate increase by 0.01%.

8. Dexia, not included in the six because its recapitalization arose in different isolated event, was also recapitalized using SPPE funding in coordination with Belgium and Luxembourg.

9. For TSS: EURIBOR + 250 bps + 5 x CDS (senior 5 years). For preferred shares, the higher of: (1) TSS interest rate increased by 24 bps every year or (2) rate equal to 105% of the dividends per ordinary share in 2009, 110% in 2010, 115% for 2011–2017, and 125% for 2018 and after.

10. 110% of the dividends per ordinary share in 2009, 120% in 2010, and 125% for 2011 and after.

11. Includes convertible preferred shares, nonconvertible preferred share, and subordinated debt. Loan amount, coupon rate, and step-up date varied across institutions.

Analysis of the non-price conditions set forth in the various recapitalization programs shows the U.S. CPP with a relatively small set of such conditions (i.e., no restructuring requirements, few limits on executive compensation, and no binding lending requirements).¹²⁹³ By contrast, the U.K. prohibited bonuses for 2008 and required restoration of mortgage lending to small and medium enterprises to 2007 levels, while France prohibited stock options and stock grants to senior executives and required a 3-4% annual increase in overall lending levels.¹²⁹⁴

e. Conclusion

Bailout may be the least favored political tool in the government's toolbox in tackling a financial crisis. It is nevertheless a necessary one. As discussed in the beginning of this part, neither ex ante capital and liquidity requirements nor ex post resolution authority could prevent

¹²⁹² *Id.* at 18.

¹²⁹³ *Id.* at 21.

¹²⁹⁴ *Id.* at Table 2. For a summary of non-price conditions for recapitalization programs, see *Id.* at Table 2.

short-term creditors from withdrawing their funds from a financial institution in trouble, even if there is only a slight chance of loss. If guarantee or insurance regimes for short-term creditors are not in place when contagion occurs, or if they are in place but systemically important financial institutions cannot find fresh capital from private sources, the government has to step in to prevent an economic free fall and play the role of “equity investor of last resort” until private funding sources are willing and able to assume the risks.

Although it is hard to pre-design a government’s bailout policy without knowing the circumstances of a crisis, there may be several “best practices” of government bailouts: (1) for a country like the United States where standing authority to inject capital into banks might not be politically feasible, Congress nevertheless should act swiftly on rescue efforts; (2) a comprehensive, proactive plan should be announced and adopted at the onset of the crisis to eliminate uncertainties in the market; (3) the government should be willing to hold current management and equity holders accountable; (4) bailout investments should be conducted in a commercial manner to the extent possible; and (5) the government should ensure transparency in its operations.

III. Overall Conclusion

An informed debate on financial regulation must consider the importance of contagion in the recent financial crisis as well as the limitations of the proposed private and public solutions to address systemic risk. The recent crisis demonstrated that bank and non-bank financial institutions, intermediaries, and short-term capital markets are uniquely vulnerable to contagion because all of them issue, hold, or facilitate the exchange of short-term liabilities that are redeemable at par. The driving principle of contagion is that the short-term creditors of an institution that is feared to be near insolvency have a rational motive to withdraw funding before the firm’s supply of liquid assets is drained by others who are responding to the same pattern of incentives. Because these institutions engage in maturity transformation, withdrawals of short-term funding can result in the inefficient liquidation of long-term assets or insolvency. Contagion can threaten the financial system in a fundamentally different way than asset interconnectedness or liability interconnectedness because run-like behavior can indiscriminately spread to solvent

institutions. A solvent financial institution displaying no characteristic warning signs of distress can be put at risk or even fail if the short-term funding market is impaired.

The direct effects of Lehman's failure on its derivatives counterparties, prime brokerage clients, structured securities investors, and MMMFs were not as problematic as feared, with very few failing as a result and no systemic destabilization occurring due to asset interconnectedness. Furthermore, since Lehman was not a major funder of other financial institutions, liability interconnectedness was also not a major problem of its failure. Nor was it a problem more generally because no major funder of other institutions failed. However, the indirect consequences of Lehman's failure were significant, as the withdrawal of an implied government backstop and the general panic that ensued caused a liquidity crisis to develop in the short-term funding markets. A particularly destabilizing consequence of this panic included money market funds enduring a run-like scenario. A run on these funds is of particular concern as both financial institutions and major non-financial entities heavily rely on the short-term funding provided by money market mutual funds, largely in the form of commercial paper. Government intervention was necessary to ensure that the biggest corporations in America would not fail as a result. The liquidity crisis also affected the behavior of short-term interbank lending channels and the market for repurchase agreement financing. Moreover, the evidence also suggests that the bailout of AIG was necessary to address the risk of contagion rather than AIG's asset or liability interconnectedness.

This paper has presented several private and public solutions to address and contain the systemic risk concerns posed by contagion. Ex ante capital requirements designed to enable financial institutions to incur losses without failing and ex ante liquidity requirements designed to ensure the existence of high-quality assets that can be sold or pledged as collateral to meet sudden withdrawals both fail to address the financial system's structural dependency on short-term funding. While these solutions and ex post resolution procedures, which are designed to impose losses on the debt and equity holders of financial institutions that are being wound down, reduce the taxpayer costs and the moral hazard introduced by a government bailout, they fail to address the risk of contagion that is an inherent consequence of financial intermediaries' and institutions' reliance on short term funding.

Although capital and liquidity requirements may reduce the likelihood that a systemically important financial institution will fail, short-term debt holders remain incentivized to withdraw their funding if for any reason they fear that the institution might fail. As noted, in 2007, U.S. banks held capital that significantly exceeded the new Basel III requirements and nearly all of these institutions still needed public support. Moreover, the proposed capital requirements do not address the risk posed by non-bank financial intermediaries. Furthermore, liquidity requirements do not guarantee that short-term creditors will not bear a loss because a run may outlast the coverage provided by the liquid assets. Similar to capital requirements, liquidity requirements apply only to traditional banks and will result in less available credit in the real economy, since every dollar of capital allocated to low-yielding, liquid, short-term securities is unavailable to finance longer term lending to borrowers. An alternative solution may simply be to place a cap on permissible levels of a financial institution's short-term funding.

The resolution procedures considered above threaten short-term debt holders with losses in the event of a financial institution's distress. Consequently, these procedures not only fail to prevent runs, but also are likely to *provoke* further runs and exacerbate systemic risk concerns. Furthermore, given that these strategies seek to avoid entirely the public costs associated with protecting short-term debt holders, at best they provide indirect or incomplete protection. The resolution strategies discussed include: issuing contingent capital to enhance loss absorption, employing creditor bail-ins upon debt holders, ring fencing "bad" assets through good bank/bad bank resolution procedures, instituting pre-packaged resolution procedures, and the use of the Orderly Liquidation Authority under Dodd-Frank for systemically important financial institutions.

Public strategies to stem contagion, including a central bank lender-of-last resort or an insurance regime for financial institutions' non-deposit liabilities, similar to the current deposit insurance regime, may better address financial companies' reliance on short-term funding. Providing protection for short-term creditors eliminates rational incentives to run, but also removes the market discipline associated with these debt securities, as creditors no longer have an incentive to monitor the financial firm. Furthermore, as with any insurance regime, moral hazard risks also arise.

To be effective, a central bank lender-of-last resort regime must be unlimited and non-discretionary. The current regime leaves open the risk that lender-of-last-resort assistance will be withheld from a distressed financial institution at a critical moment, and thus short-term creditors remain incentivized to withdraw in the face of such distress. An explicit guarantee, as opposed to the implied guarantee that existed before Lehman's failure, assures short-term creditors that they will recover all of their funds, thus removing their incentive to run in anticipation of large losses. Funding of such a program might be achieved through an assessment imposed on healthy financial institutions, either before or after a crisis, which would minimize cost to taxpayers.

A public insurance regime for non-deposit liabilities also provides assurances to short-term creditors, thus preventing contagious runs. Insurance premiums charged to covered financial institutions before a crisis occurred would internalize the costs of such a program. However, a concern remains that the insured creditors, similar to insured parties protected from loss in any insurance system, have no incentive to monitor an issuer's risk taking. This loss of market discipline might be mitigated through risk-based pricing of short-term liability insurance premiums but getting the pricing right is a difficult task. Furthermore, effective implementation of a universal financial liability insurance program would require the resolution of several questions concerning its scope, size, overall structure, and funding. In addition, regulating the activities of covered financial institutions and achieving international participation would also be key components. Ultimately, ensuring that public loss exposure is minimal must always be an overarching goal.

Finally, this paper addressed direct capital injections or "bailouts." As discussed, the use of taxpayers' funds to save ailing financial institutions during the financial crisis through TARP and the CPP was highly contentious. As a result, a primary focus of Dodd-Frank was to provide alternative mechanisms for addressing crises going forward with the goal of avoiding future bailouts. The list of criticisms of bailouts is long: taxpayers may suffer loss; bailouts may not work over an extended period of time, if at all; bailouts create moral hazard; decisions to bail out are ad hoc and may be politically charged; and, given their ad hoc nature, bailouts may actually exacerbate contagion since short-term creditors are more likely to run in the face of this uncertainty. Despite these criticisms, public capital injections may still be necessary if other measures, including lending and guarantees, prove ineffective. There may be ways to structure a

bailout to address many of the concerns that were raised following TARP, including adopting a comprehensive bailout plan at the beginning of a crisis to eliminate market uncertainty, ensuring government transparency, and holding the failing institution's management and equity holders accountable.

Given this paper's ultimate conclusion that contagion, rather than asset or liability interconnectedness, was the primary driver of systemic risk in the recent financial crisis, current and future regulation should be focused on mitigating the risks posed by contagion. As discussed throughout, effective regulation aimed at addressing contagion must internalize the systemic costs of financial intermediation, while minimizing taxpayer costs and limiting creation of moral hazard. Several potential policies and solutions have been outlined and analyzed with this in mind, which hopefully will stimulate a vigorous debate on how best to achieve these objectives.