Financial Firm Bankruptcy and Systemic Risk

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April 2009

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I am grateful for helpful comments from Brent Ambrose, Adam Ashcraft, Mark Carey, Lee Crabbe, Ingo Fender, Ann Gabor, Jacob Gyntelberg, Beverly Hirtle, Jay Huang, Frank Keane, Srinivasan Krishnamurthy, Paul Kupiec, Frank Packer, Stavros Peristiani, Lukas Roth, Eric Santor, Nikola Tarashev, Andrew Zhang, Gaiyan Zhang and participants at the FDIC's 19th Annual Derivatives conference.

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Financial firm distress often leads to regulatory intervention, along the lines of "too big to fail" (TBTF) policies. Despite the moral hazard implications of such actions, regulators often fear that the collapse of a financial firm will lead to negative spillovers into the real side of the economy. The mechanism by which financial crises connect these firms to the economy is not well understood, but two oft-cited channels are domino effects (counterparty risk) and the effects of fire sales on markets, which may transmit to the economy through a financial accelerator. In this paper we analyze the policy responses for avoiding systemic risk while considering the role of these two factors. Evidence from past bankruptcies suggests that cascades caused by counterparty risk do not occur, as most firms diversify their exposures. Instead, crises tend to be symptomatic of common factors in financial firms' portfolios, which lead to widespread instances of declining asset values. These low asset values are often misinterpreted as resulting from fire sales by distressed firms, but are more likely to represent massive losses from poor investment choices. Fire sales in the U.S. are less likely because bankruptcy laws allow substantial time for the disposal of impaired assets. In sum, the two main reasons for TBTF policy, counterparty risk and fire sales, are unlikely to pose major risks to the system should failed financial firms be permitted to file for bankruptcy protection. Instead, regulators focus should be on broad approaches, such as fiscal stimuli, that will mitigate wealth effects for a large group of consumers who have all suffered from exposure to common risk factors in their investment portfolios.

Key words: Financial institutions, systemic risk, Too big to fail, fire sales, counterparty risk

JEL codes: G28, G33, E44, E58, E61

Systemic risk is the risk that the financial system will fail to function properly because of widespread distress. Failure of the system implies that capital will not be properly allocated: That is, positive net present value projects will not be undertaken because the collapse of the system leads to a shortage of credit, possibly due to an inability or unwillingness on the part of investors to fund risky projects that they might have pursued prior to the crisis. Such pervasive financial fragility may occur because the failure of one firm leads to the failure of other firms which cascades through the system (e.g., Davis and Lo (1999) and Jarrow and Yu (2001)). Or systemic risk may wreak havoc when a number of financial firms fail simultaneously, as in the Great Depression when more than 9,000 banks failed.[1] The conventional wisdom is that systemic risk should be prevented, or at least mitigated, in order to avoid the risk of a deep economic downturn.

Much of the evidence supporting the need for strong regulatory action vis-a-vis systemic risk comes from the Great Depression, which provides overwhelming proof that failure to prevent systemic risk episodes can be extraordinarily costly to the real economy. Friedman and Schwartz (1971) argue that the Great Depression would likely never have been as deep and painful as it was had the Federal Reserve (the Fed) increased the money supply in the face of a declining money multiplier (owing to a reduction in the amount of money passing through the banking system as thousands of banks failed). Bernanke (1983) further posits that the financial firm crisis of the Great Depression exacerbated the money supply problems with severe disruptions in the credit allocation process. Japan's Lost Decade provides further evidence that a weak financial system can lead to disastrous effects on the real side of the economy. Despite the fact that depositors in Japan were highly unlikely to lose any money from bank failures, and

[1] See Benston (1986).

despite the tacit willingness of Japanese regulators to let economically insolvent banks continue to operate, the weak banking system sharply raised the cost of uninsured funding for Japanese banks (see Covrig, Low and Melvin (2004)) and simultaneously reduced the availability of new bank credit.

Such extreme real effects that appear to be the result of financial firm fragility have led to a large emphasis on the prevention of systemic risk problems by regulators. Foremost among these policies is "too big to fail" (TBTF), the logic of which is that the failure of a large bank or financial institution will have ramifications for other financial institutions and therefore the risk to the economy would be enormous. TBTF was behind the Fed's decisions to orchestrate the merger of Bear Stearns (henceforth, "Bear") and J.P. Morgan Chase (henceforth "JP") in 2008, its leadership in the restructuring of bank loans owed by Long Term Capital Management (LTCM), and its decision in Fall 2008 to prop up the insurer American International Group (AIG). TBTF may be justified if the outcome is prevention of a major downswing in the economy. However, if the systemic risks in these episodes have been exaggerated or the salutary effects of these actions overestimated, then the cost to the efficiency of the capital allocation system may far outweigh any potential benefits from attempting to avoid another Great Depression.

Considering that much of the fear of systemic risk appears to be the fear of creating another Great Depression, we should consider how the financial system in the U.S. today might respond to similar crises if the Fed were to let the events play out without interceding. Many differences exist between that episode and any crises that might occur in the U.S. today. First, the Great Depression occurred at a time before deposit insurance so the real decline in consumer

wealth as a result of bank insolvencies was substantial for a large number of ordinary Americans. Moreover, even such large shocks to the system might have been relatively minor (i.e., a recession instead of a deep depression) had the Fed followed a more expansive monetary policy in the face of these failures. Given the Fed's recent track record, it is inconceivable that a multitude of bank failures could again be accompanied by such restrictive monetary policy. Considering these differences, one could easily argue that regulator's interventions in recent financial crises are misguided.

No doubt, no regulator wants to take the chance of standing down while watching over another systemic risk crisis, so we do not have the ability to examine empirically what happens to the economy when regulators back off. There are very few instances in the modern history of the U.S. where regulators allowed the bankruptcy of a major financial firm. Most recently, we can point to the bankruptcy of Lehman, which the Fed pointedly allowed to file for bankruptcy. However, with only one obvious case where TBTF policies were overturned, we have only an inkling of how abandoning TBTF policy might affect systemic risk. Moreover, at the same time that Lehman failed, the Fed chose to bail out other financial firms – money market mutual funds (MMMFs), commercial paper issuers like GE Capital, and AIG. These bailouts had followed only six months after the Fed arranged for the merger of Bear and JP, so expectations of a bailout were running high at the time. All in all, observing one bankruptcy in the midst of several TBTF bailouts makes it very difficult to draw conclusions about empirical patterns in the data. Furthermore, at the time of the AIG bailout the Federal Reserve and the Treasury were campaigning for Congress to allocate TARP funds and engaged in scaremongering about the prospects of a second Great Depression to make the passage of TARP more likely. We will never know if the market's reaction following the Lehman bankruptcy reflected fear of contagion

from Lehman to the real economy or fear of the depths of existing problems in the real economy that were highlighted so dramatically by Mssrs. Bernanke and Paulson.

Besides Lehman, a few other large financial firms such as Drexel and Finova, have also been allowed to fail, but one can argue that they were not large enough to deserve TBTF status or that they involved fraud, making it much less likely that investors would extrapolate the experiences with those firms to the rest of the financial services industry. Nonetheless, these cases and a few others in the sparse history of financial firm failures in post-Great Depression U.S. allow us to analyze the mechanisms by which such risk could cause an economy-wide collapse. We focus on two types of contagion that might lead to systemic risk problems: (1) *information contagion*, where the information that one financial firm is troubled is associated with negative shocks at other financial institutions largely because the firms share common risk factors; or (2) *counterparty contagion*, where one important financial institution's collapse leads directly to troubles at other creditor firms whose troubles snowball and drive other firms into distress. The efficacy of TBTF policies depends crucially on which of these two types of systemic risk mechanisms dominates. Counterparty contagion may warrant intervention in individual bank failures while information contagion likely does not.

If regulators do not step in to bail out an individual firm, the alternative is to let it go bankrupt. In the case of a failed commercial bank or other depository institution, the process involves the FDIC as receiver and the insured liabilities of the firm are very quickly repaid. For example, in the recent failure of IndyMac Bank, the FDIC allowed depositors to withdraw their insured funds through automatic teller machines, suggesting minimal disruptions for these depositors. Other creditors may or may not receive partial repayment of their funds in a timely

fashion (see Flannery and Sorescu (1996) and DeYoung and Reidhill (2008)). In contrast, the failure of an investment bank or hedge fund does not involve the FDIC and may closely resemble a Chapter 11 or Chapter 7 filing of a nonfinancial firm. However, if the nonbank financial firm in question has liabilities that are covered by the Securities Industry Protection Corporation (SIPC), the firm is required by law under the Securities Industry Protection Act (SIPA) to liquidate under Chapter 7.[2] This explains in large part why only the holding company of Lehman filed for bankruptcy in 2008 and its broker-dealer subsidiaries were not part of the Chapter 11 filing.

A major fear of a financial firm liquidation, whether done through the FDIC or as required by SIPA, is that fire sales will depress recoveries for the creditors of the failed financial firm and that these fire sales will have ramifications for other firms in related businesses, even if these businesses do not have direct ties to the failed firm (Shleifer and Vishny (1992)). This fear was behind the Fed's decision to extend liquidity to primary dealers in March 2008 - Fed Chairman Bernanke explained in a speech on financial system stability that

> "the risk developed that liquidity pressures might force dealers to sell assets into already illiquid markets. This might have resulted in …[a] fire sale scenario…, in which a cascade of failures and liquidations sharply depresses asset prices, with adverse financial and economic implications."[3]

The fear of potential for fire sales is expressed in further detail in the same speech as a reason for the merger of Bear and JP. The idea is that without the merger, Bear would have been forced into bankruptcy and the dire consequences of fire sales would have ensued:

[2] See Don and Wang (1991).
[3] Bernanke's May 13, 2008 speech at the Federal Reserve Bank of Atlanta financial conference at Sea Island, Georgia. The identical speech was presented again to the Risk Transfer Mechanisms and Financial Stability Workshop, Basel, Switzerland (the BIS) on May 29, 2008.

> "Bear advised the Federal Reserve…that it would be forced to file for bankruptcy the next day unless alternative sources of funds became available. A bankruptcy filing would have forced Bear's secured creditors and counterparties to liquidate the underlying collateral and, given the illiquidity of markets, those creditors and counterparties might well have sustained losses. If they responded to losses or the unexpected illiquidity of their holdings by pulling back from providing secured financing to other firms, a much broader liquidity crisis would have ensued….the Federal Reserve Board judged that it was appropriate to use its emergency lending authorities …to avoid a disorderly closure of Bear."

Bernanke's description of the bankruptcy process highlights the idea that creditors of a failed firm are forced to liquidate assets, and to do so with haste. However, U.S. bankruptcy laws are set up with the idea that creditors should be allowed to maximize the value of the assets now under their control. If that value is maximized by continuing to operate, the laws allow such a reorganization of the firm. Admittedly, there is a prejudice against reorganization of financial firms, due to concerns about allowing fraudulent securities sales to continue unhampered, but there is certainly no prejudice against selling assets in an orderly procedure to maximize the value to creditors, be they secured or unsecured.

Bankruptcy actually reduces the likelihood of fire sales because assets are not sold quickly once a bankruptcy filing occurs. Upon filing for bankruptcy, cash does not leave the firm without the approval of a judge. Without pressure to pay debts, the firm can remain in bankruptcy for months as it tries to decide on the best course of action. Indeed, a major complaint about the U.S. code is that firms can easily delay reorganizing and slow down the process (Bradley and Rosenzweig (1992), Weiss and Wruck (1998), Bebchuk and Chang (1992), Wruck (1990) and Weiss (1990)). If, however, creditors and management believe that speedy assets sales are in their best interest, then they can press the bankruptcy judge to approve quick action. This occurred in the case of Lehman's assets involving workers, who might have given up on the firm and left haphazardly were their divisions not sold quickly with the judge's

approval. Concerns that a bankruptcy filing will force the firm to engage in fire sales are unwarranted given that bankruptcy laws are set up to allow time for an orderly process of dealing with the distressed firm's assets.

Not all countries have the same bankruptcy rules, and even within the U.S., the rules differ for financial firms with SIPC or FDIC coverage. Bankruptcy may be viewed as a harsher outcome for some firms compared to others. In particular, a tendency toward liquidation that destroys value may drive firms to restructure out of court to reduce this inefficiency (Haugen and Senbet (1978)). If so, then fire sales might occur *before* the firm files for bankruptcy as a last chance attempt to stave off liquidation. Nonetheless, the extent to which fire sales occur outside of bankruptcy is a function of the stringency of the bankruptcy code: The more lenient the code toward debtors, the less likely a firm will find it optimal to engage in a fire sale out of court to avoid bankruptcy. In the U.S., bankruptcy cases that are not automatically receiverships are not harsh in the sense that debtors have time to consider their alternatives (Smith and Stromberg (2004)). In the bankruptcy court supervised sale of a fraction of Lehman assets to Barclays Global, the pace was extraordinarily quick (although considerably slower than the sale of Bear to JP) but the sale only involved assets that were considered likely to deteriorate in value if not sold quickly (i.e., assets involving employees). The remaining assets are likely to be sold off in a much slower fashion as investors struggle to determine the true value of credit losses. As a result, neither creditors nor shareholders are taken advantage of by bottom-fishing merger partners.

In order to see the potential benefits of various regulatory responses to a financial crisis, including that of bankruptcy, we must first consider the causes of financial firm distress. These

are discussed in section 2. The cost of bankruptcy and other responses that aim at minimizing moral hazard issues depend on the extent to which formal bankruptcy risks systemic effects on the economy. While we cannot know with certainty the potential for an outcome such as the Great Depression, we can examine the impacts of previous financial firm failures. This is the topic of section 3, which discusses the cases of Finova, Drexel and the Bank of New England. Section 4 considers various regulatory responses to the distress of financial firms. Section 5 concludes.

II. The Causes of Financial Crises

The appropriate policy response to a large financial firm failure depends crucially on the nature of the collapse. Society might benefit if regulators salvage assets in the failed firm and keep the entity as a going concern, regardless of how the firm value landed at so low a level. However, one must also consider the signal sent to investors if firms receive aid despite having made poor choices that caused the drop in firm value. Essentially, the appropriate policy response weighs the trade-off between preventing systemic risk and preventing an atmosphere of reliance on government handouts (the so-called moral hazard problem). That trade-off depends critically on the effectiveness of the measures intended to prevent systemic risk, which in turn depends on the nature of the crisis: counterparty risk or information contagion. In the former case, the collapse of one bank leads directly to the collapse of another and so forth (e.g., Jarrow and Yu (1999), Davis and Lo (1999), Giesecke (2002)). For example, if we observe ten failed banks that suffered only from counterparty risk, we can draw a line connecting each one's liabilities to the failure of another in the set of ten. With information effects, there is no such line. Instead, all ten banks share a set of risks in their portfolios. Even if none is a creditor in the

other's bankruptcy, all ten will experience distress simultaneously (or at least within the same short time period), because all ten invested in the same types of assets which now have substantially lower values. We refer to this as information contagion because frequently the ten banks do not fail exactly simultaneously. Rather, one bank fails first and investors in the other nine banks correctly infer that their banks are also in trouble and act accordingly.

Rochet and Tirole (1996) argue that regulators can intervene in two ways: they can help out the bankrupt bank or they can help out the creditors of the bankrupt bank. Implicitly, they are assuming counterparty is the main source of financial firm distress. If regulators help out the creditors, rather than the initial bank, the initial distressed bank is allowed to go under, imposing a penalty on the financial firm for failing to control the credit risk of its portfolio. This sends a signal to investors to carefully monitor their assets and choose investments wisely. At the same time, the choice to help out the creditors prevents a widespread crisis. This is because the regulators would also involve inject capital into creditor firms of the failed bank if they are at risk of failing themselves as a result of the bankruptcy.

A. Counterparty Contagion

In a case of counterparty contagion, the initial bank gets into trouble and the other banks become distressed as a result (e.g., Davis and Lo (1999)). Commercial banks make loans to each other (Rochet and Tirole (1996)) and investment banks make loans to and/or invest in other financial firms. Thus, the financial sector is at risk for systemic problems because many firms have exposure to the failed firm. Implicitly, this scenario assumes that whatever caused the first bank to lose its capital did not cause other firms to lose their capital at the same time. For

example, in the case of Bear, Fed Chairman Bernanke described the situation to Congress[4] as "extremely complex and interconnected." He further declared:

> "Bear Stearns participated extensively in a range of critical markets. The sudden failure of Bear Stearns likely would have led to a chaotic unwinding of positions in those markets and could have severely shaken confidence. The company's failure could also have cast doubt on the financial positions of some of Bear Stearns' thousands of counterparties and perhaps of companies with similar businesses. Given the exceptional pressures on the global economy and financial system, the damage caused by a default by Bear Stearns could have been severe and extremely difficult to contain. Moreover, the adverse impact of a default would not have been confined to the financial system but would have been felt broadly in the real economy through its effects on asset values and credit availability. To prevent a disorderly failure of Bear Stearns and the unpredictable but likely severe consequences for market functioning and the broader economy, the Federal Reserve, in close consultation with the Treasury Department, agreed to provide funding to Bear Stearns through JPMorgan Chase."

Similarly, in testifying to Congress[5] about the bailout of AIG, Bernanke implied that the firm's counterparties may have defaulted had the insurer been allowed to fail:

> "....it was well known in the market that many major financial institutions had large exposures to AIG. Its failure would likely have led financial market participants to pull back even more from commercial and investment banks, and those institutions perceived as weaker would have faced escalating pressure. Recall that these events took place before the passage of the Emergency Economic Stabilization Act, which provided funds that the Treasury used to help stem a global banking panic in October. Consequently, it is unlikely that the failure of additional major firms could have been prevented in the wake of the failure of AIG. At best, the consequences of AIG's failure would have been a significant intensification of an already severe financial crisis and a further worsening of global economic conditions. Conceivably, its failure could have resulted in a 1930s-style global financial and economic meltdown, with catastrophic implications for production, income, and jobs."

[4] Testimony on April 3, 2008 to Committee on Banking, Housing, and Urban Affairs, U.S. Senate.

[5] Testimony on March 24, 2009 to Committee on Financial Services, U.S. House of Representatives.

In such cases of counterparty risk, the interconnectedness of the financial firms makes it highly unlikely that a second financial firm could withstand losses induced by the first firm. While the idea of a domino effect of one firm failing and starting a cascade of additional failures seems eminently plausible, empirically such a failure of one bank could only cause the financial distress of other banks and therefore a systemic crisis if a number of conditions were to hold. First, the initial bank must be large (hence the TBTF policy). Second, it must have experienced a large decline in the value of its assets (so the losses imposed on other firms are substantial). In addition, for such a cascade to continue throughout the system, the losses imposed on these creditors must be a large fraction of their assets, which is to say that the creditors of this large bank must be quite undiversified. Otherwise, the losses at the first bank will not be great enough to cause a crisis in the second bank. It is an empirical question as to whether this "perfect storm" combination of events is likely to occur in nature and be a representative example of the cause of financial crises.

In order to conclude that counterparty risk is a major cause of financial crises, we must be able to conclude that the crisis originates at the initial bank. This suggests that the shock that drove the initial bank into distress was idiosyncratic in nature – otherwise, if other banks also suffered major shocks, it would not be appropriate to describe the initial bank as *causing* distress in other firms. In the setting of Rochet and Tirole (1996), the problem at the initial bank is poor credit analysis and monitoring. Had the initial bank done its job correctly, it would not be the subject of discussion of a bailout to prevent systemic risk. Idiosyncratic shocks related to poor banking practices are often related to fraud or at least a business plan that was especially reckless, perhaps because of the overzealous or pernicious actions of one person or people at one

firm. One can point to Drexel, Barings and Franklin National Bank as instances where criminal activity was charged and the public viewed it as the dominant reason for the firm's collapse. Not surprisingly, the policy responses in these cases were not cases of TBTF – the desire to punish poor investment choices far outweighed concerns over the potential loss of confidence in the system or counterparty risk. Nonetheless these failures did not lead to systemic risk. While it is possible these firms did not have much impact on the system as a whole because they were too small to qualify as TBTF firms, the fact that they had little in the way of ripple effects casts serious doubts on the potential for counterparty risk and the cascade mechanism by which it affects the real economy.

If the cause of distress at the first institution is idiosyncratic, the subsequent losses are less likely to be very large compared to a scenario where many assets systematically lose value. For counterparty risk to be a major concern, idiosyncratic losses at the initial bank would have to be widespread losses on the portfolio that stem from a credit policy that differs sharply from those of other financial institutions. Moreover, in a setting such as that of Rochet and Tirole's (1996) and David and Lo (1999) and other contagion models, the second, third and other banks only follow into distress because they have ties to the initial bank. If a bank is not a creditor of the initial bank, it will not require assistance. Systemic risk then requires strong ties to the initial bank and strong ties among the remaining banks.

Whether or not this situation is of major concern to regulators is an empirical question, and, unfortunately, one for which data are quite limited. Nonetheless, the empirical evidence to date suggests that no such domino effect would take place were regulators to abandon TBTF policies. Of course, the situation could be more extreme for the very largest financial institutions

that have not been allowed to fail, but studies of bankrupt companies to date point to very limited counterparty effects on other firms. Lang and Stulz (1992), Theocharides (2008) and Jorion and Zhang (2007) study the effects on stock prices, bonds, and credit default swap (CDS) rates, respectively, of other firms in the industry when a bankruptcy occurs. If counterparty effects on suppliers are very large, the other securities in the industry should experience a severe drop in value upon the announcement of the initial bankrupt firm. While these studies find statistically significant effects, the relatively small impact suggests that suppliers in the bankrupt firms' industries do not collapse in a cascading fashion. Hertzel, Li, Officer and Rodgers (2008) examine suppliers and customers of the distressed firms that list the bankrupt firms in their 10-Ks. The SEC requires publicly traded firms to list such financial relationships if sales to one firm account for at least 10 percent of the total. Hertzel et al. find that customers are not affected by the filing but that suppliers are. However, the average effect for suppliers is less than 2% of the market value of equity, hardly enough to force the average supplier into distress.

A study that is more specifically focused on the issue of counterparty risk is that of Jorion and Zhang (2008), henceforth JZ, who show that the effects on counterparties are remarkably small.[6] Their data cover bankruptcies that were filed during1999-2005 and include the claims owed to the top twenty unsecured creditors in each filing.[7] Because these were Chapter 11 filings, most of the bankrupt firms are nonfinancial entities, with only a small fraction of the

[6] Kabir and Hassan (2005) also focus specifically on counterparties in a case study of the failure of LTCM. They also find small impacts, as the decline in the market value of the equity of LTCM's 14 counterparties was only 6%, again hardly enough to cause a second bankruptcy.

[7] Secured creditors would obviously experience even smaller counterparty losses given the collateral backing their loans.

cases involving financial firms.[8] However, one would expect the effects for nonfinancial firms to be stronger than for financial firms, as their suppliers are not required by regulators to have a diversified cash flow. For example, it would not be surprising to find that the collapse of an auto manufacturer leads to the collapse of an auto parts supplier because of firm specific investments made by the supplier. We expect the supplier to sells its auto parts to only one automaker. We also expect that the parts supplier will be fairly concentrated in its focus (i.e, to be small and only have one segment), so it will have few other sources of cash flow besides the sales of auto parts. Thus, the extremely undiversified asset base of this nonfinancial firm would be very susceptible to the collapse of its major customer. In contrast, we would not expect financial firms and their creditors, who are also financial firms, to involve such large exposures.

Financial firms rarely have such focused business plans, as they actively seek to diversify their assets. For example, a bank that lent money to the same auto manufacturer would have much less exposure than our hypothesized parts supplier because bank regulations limit the size of any one loan. Specifically, loans to one borrower may not exceed fifteen percent of the bank's capital. And few banks would lend to the point where they find that constraint binding, as the profitability of such a loan would be more than offset by its potential for causing bankruptcy. Instead, large loans that would unduly concentrate a bank's portfolio are typically underwritten by a syndicate. By the same logic, if a bank or insurance company or broker were to fail, it is unlikely that their top twenty creditors would have a very large portion of its assets tied up in this

[8] Many financial firms are not eligible to file for Chapter 11 because they have regulated businesses that would by law be required to liquidate (Chapter 11 is not intended for liquidations but reorganizations). If a stock broker goes bankrupt, its accounts will fall under the regulation of SIPC and SIPC will oversee its liquidation. Financial firms whose liabilities include deposits would also not enter Chapter 11, as bank regulators would put the entity into receivership. Likewise, state insurance commissioners would take control of insurers. Financial holding companies who own equity in bank, insurance or brokerage subsidiaries could enter Chapter 11 if they do so without their subsidiaries (e.g., Lehman in 2008).

firm. Furfine (2003) shows that counterparty exposures in the interbank loan market (the fed funds market) is quite small, and therefore are probably not large enough to present a system-wide threat to the banking system.

Anecdotally, we can point to the bankruptcy of Lehman in September 2008, which filed at the holding company level with $600 billion in liabilities. The largest single creditor reported in the bankruptcy filing was Aozora Bank, based in Tokyo, which was owed a mere $463 million, or less than one tenth of one percent of the claims in Lehman's filing.[9] While a figure that is only a tad under a half billion is not a trivial loss, Aozora made clear that it had offset much of the exposure, estimating its loss at only $25 million (in part because it had purchased insurance on its Lehman claim with a credit default swap). Thus, the expected loss of the largest creditor is quite small, especially when compared to the $7.4 billion capital base of Aozora.

The Lehman Aozora anecdote appears to be quite representative of the general situation, given the evidence in JZ's sample of 694 creditor-events. In their sample, a financial firm, Citibank, is owed the largest amount of any claim in the database ($1.75 billion). Nonetheless, as with Aozora, that claim is small relative to the size of Citibank's portfolio. We can see from the exposure statistics in their Table V, the largest percentage exposure among the 111 claims owed to financial institutions is only 2.39 percent of market value. As a percentage of assets, this figure is many times smaller because banks are highly levered entities. Moreover, in the case of Citibank's $1.75 billion claim, the bankrupt firm, Enron, did not lose so much value that

[9] Bankruptcy regulations require the failed institution to list the top 20 unsecured creditors (presumably the creditors with the most to lose, as secured creditors have collateral to back their debts). Often, the largest creditor on the list is a trustee for unsecured bondholders. The trustee is not at risk of losing money, only his clients. As the clients are not listed separately it is difficult to determine who among the unsecured creditors is truly the single largest. However, as bankruptcies proceed the holdings of the bonds typically move into the hands of vultures, who rarely own more than a third of any one bond class, suggesting the original list of bond creditors had much lower holdings.

Citibank had no recovery on the loan: they only wrote down the value by $228 million, so their loss was only a fraction of the claim filed in the bankruptcy court. Most claims are substantially smaller, measured either by dollars or percent: the mean claim in the sample is $11.5 million and the mean exposure as a percent of market value is 16 basis points. Many of these are trade credits, which are very small. However, even restricting the claims to those owed to financial sector specialists, bonds and loans, the average claims are $17.1 million and $163.6 million, respectively. Recall that these claims are among those owed to the top 20 unsecured creditors, so the *average* claim in the bankruptcy is much smaller.

More often, the largest claims in percentage terms arise with suppliers and not financial institutions. JZ investigate all creditors in the sample who have one or more customers that account for at least 10 percent of their revenue by examining 10-K filings. None of these firms with such strong reliance on one customer are financial firms. But even among the nonfinancial firms, the incidence of extreme concentration of sales is rare. Only six firms in the sample list the bankrupt firm as a major customer in their 10-Ks and the average exposure among these firms is only 11 percent.

JZ's sample supports our conjecture that most firms have diversified cash flows or at least are diversified across customers. Few firms suffer dramatically from the bankruptcy of a single firm with which they have business ties because few firms have such strong ties that a bankruptcy would throw them into distress. Not surprisingly, then, do we find that the 251 bankruptcies in JZ's sample rarely trigger a cascade of subsequent bankruptcies: only 22 creditors in the sample delist within two years of the 251 initial bankruptcies. Furthermore, inferring that 22 cases of distress occurred as a result of the 251 bankruptcies overstates the

incidence of counterparty-induced bankruptcy because not all of these delistings can be tied to the original 251 failures. Moreover, the problems at these 22 creditor firms can hardly be described as part of a cascade of failures, as no other firms failed as a result of problems at the 22 affected firms. A cascade set off by counterparty risk is a situation where one firm's failure causes another firm's failure which causes a third firm's failure on so on. If counterparty risk were to explain the event of ten firms failing in a short period of time, we would have to see that the first firm causes the second firm's problems, which in turn causes the third firm's distress, and so on up to ten. JZ's data indicate that there is never a third firm involved, let alone a fourth, fifth, sixth, seventh, eighth, ninth or tenth.

What if the evidence in JZ's sample is unrepresentative of what would happen in a serious disaster? After all, their sample includes seven years of which only two are recession years and the 2000-2001 recession was not considered especially severe. Perhaps the incidence of second and third defaults is understated in their data because they do not examine a period as disastrous as the Great Depression. Again the data are not available for such a study, but we can consider analytically the difference in bankruptcies that occur because of systematic risk and those that arise from idiosyncratic risk. Recall that the important issues are the severity of the shock and the degree of diversification of the counterparties. We have no reason to believe that counterparties would be more or less diversified in different economic settings, but we do know that the severity of the shock to the first firm is likely to be greater when the source is idiosyncratic. Idiosyncratic risk is substantially larger than systematic risk (marketwide volatility or industry volatility) for the typical listed firm (see Campbell, Lettau, Malkiel and Xu (2001)). A priori, then, the first firm's shock on average would be lower in times when the

shocks are macroeconomic in nature and therefore would decrease the potential for failure by a second firm relative to the events studied by JZ.

B. Information Contagion

Rather than counterparty risk, financial crises are more often situations where we observe dozens of distressed firms in the same time period because the firms have a common factor causing simultaneous incidences of financial distress. For example, in the credit crisis starting in 2007, we observed major losses and/or failure at Merrill Lynch, UBS, Bear Stearns, Lehman, Washington Mutual, Countrywide, AIG, Fannie Mae, Freddie Mac, and Indy Mac. These ten firms rarely had strong business ties to each other- Lehman's bankruptcy filing did not list any of these troubled firms as major creditors. Rather, the ten firms share a common exposure to the mortgage market, specifically the subprime mortgage market. Thus, when Bear failed, the major effect on the market was to trigger a re-evaluation of other financial firm's health. Not surprisingly, once Bear got into trouble investors focused considerable attention on Lehman, the investment banking firm that most closely resembled Bear.

In times of financial upheaval, investors look into their portfolio with greater scrutiny and try to identify securities that have something in common with those of the first failed firm. The common factors in these episodes may be related to industry, such as the collapse of oil prices leading to widespread defaults by independent oil companies in the mid-1980s (see Helwege and Kleiman (1990)) or the extreme exposure to commercial real estate in the insurance industry around 1990 (see Fenn and Cole (1994)). Or, it may be a common problem regarding the degree to which investors understand the risk of the firm, either because of fraud or imperfect accounting information as in Enron or Worldcom (see Duffee and Lando (2001), Collin-

Dufresne, Goldstein and Helwege (2004) and Yu (2005)). Or it may be a common factor related to a macroeconomic variable, such as the failures of S&Ls in the early 1980s due to interest rate risk (Helwege (1996)).

Each firm is exposed to a particular factor, and that factor moves in such a way as to cause a negative shock to security prices. One can think of these shocks as normally distributed, or at least drawn from a distribution that has more mass at the mean than at the extremes. Among all the financial firms that experience a negative shock associated with this factor, we expect that the ones with the most negative shocks will be among the first to become insolvent. Thus, when we observe ten firms enter distress because of an event like the subprime crisis of 2007, a reasonable conclusion is that the first firm to catch the attention of regulators is the one in the worst situation. Investors in the other nine firms watch how this firm is treated; they glean new information from the announcements regarding the problems as well as from the ways in which the regulators attempt to solve the problem; and they trade in the marketplace on this new information, leading to updated valuations of the securities associated with the other nine firms. The other nine firms' stocks are likely to fall as a result of this re-evaluation – it is highly unlikely that the first firm will attract the attention of regulators and those regulators will announce that the firm is fine and their opinion will carry weight for some length of time (the SEC did make such a statement regarding Bear but within a few days the Fed said they were on the verge of bankruptcy and likely to cause a financial meltdown of the entire system). As the market value of these firms approaches zero, they may seek capital to bolster their positions. That capital, if successfully raised, will be at a very low price.

Empirical studies of past failures suggest information effects are extremely important. Lang and Stulz (1992) find that stock market reactions to nonfinancial firm bankruptcies can be positive, reflecting the fact that a bankruptcy filing of one firm may give investors confidence that excess capacity in the industry will finally be taken off line and that the firm's competitors will gain market share going forward. Of course, not surprisingly, the information effects are often negative. Lang and Stulz also find that some bankruptcies lead to very negative stock market effects for other firms in the industry, reflecting investors' revaluations of assets in that industry. Similar results are found in Jorion and Zhang (2007, 2008) and Theocharides (2008). Collin-Dufresne et al. (2004) consider the impact of credit events that affect bondholders and find strong reactions in the rest of the bond market, even when no such event directly concerned the other bonds. Crabbe (1991) shows that credit events involving leverage buyouts (LBOs) led bond investors to charge higher premia on new bonds that might subsequently undergo an LBO, but which were currently unaffected by such leverage. Sovereign risk researchers have long argued that emerging market countries with no obvious economic ties to a failing country are affected by its crisis (e.g., Kamin and Von Kleist (1999), Eichengreen and Mody (2000)). Insurance company failures in the early 1990s, investigated by Fenn and Cole (1994) and DeAngelo, DeAngelo and Gilson (1994), suggest that investors revalued their insurance stocks to reflect the dire news that First Executive Corporation was likely to be insolvent.

Regardless of the nature of the common factor that causes these various negative shocks, in these situations it is quite ineffectual to apply TBTF policies to the first failed firm. Helping out this firm, which has no ties to the other firms that are affected, does nothing to improve their balance sheets. Indeed, one can argue that helping out the first firm brings extra attention to the other firms who might have muddled through the crisis were they not under such pressure to

improve their capital positions. In any case, money pumped into the first firm is unlikely to find its way to the other firms. Helping out the first defaulting firm will have no impact on the losses incurred by the second, third and fourth firms to default if the firms have no business ties to each other. In contrast, the government to spend the same aggregate amount and divvy it up among all the affected firms. In the latter case, all the firms would be impacted by the aid and the ones with smaller shocks would be more likely to survive as a result.

An important element of financial crisis analysis is the mechanism by which information contagion leads to systemic risk. If many financial firms are exposed to a risk factor that experiences a negative shock, a downturn in the financial sector of the economy may easily follow. But how does this turn into real effects on GDP? Without a complete understanding of the channel by which their troubles become the troubles of the entire economy, we cannot speak to the issue of how regulators should respond. A good starting place for thinking of the transmission of financial shocks to the real economy is Friedman and Schwartz (1976). They argue that financial crises lead to shrinkage of the financial system. In the case of the Great Depression, the shrinkage arose directly from the fact that bank depositors withdrew funds and did not put them into other institutions that might circulate the money, so the net effect was less money circulating through the financial system. Given that the financial system has a money multiplier effect that amplifies high powered money into the broader money supply, a decrease in deposits means a decrease in the money supply. Friedman and Schwartz argue that the decrease in the money supply was not offset by the Fed. Without a concomitant reduction in prices, MV=PQ implies that the quantity of goods produced in the economy will drop.

Bernanke (1983) argues that these effects are unlikely to be the whole story because the magnitude of the decline in the real side is out of proportion to the decline in the money supply. Instead, he claims that the financial system carnage relates to the real side through the cost of intermediation – banks make money by borrowing and lending, but if the spread between them is too high (reflecting the high costs of analyzing borrower's credit risk) then the amount of lending will fall and projects will go unfunded. In this case, the negative shocks to financial firms work their way through the system because these firms pull back in their lending (as they find that funding is costlier or that credit analysis takes more effort and time), which in turn leads to less investment in the economy and weaker prospects for economic activity. Bernanke, Gertler and Gilchrist (1999) hypothesize a financial accelerator mechanism, whereby distress in one sector of the economy leads to more precarious balance sheets and higher credit spreads to reflect the increased risk of default. This leads to a drop in investment, which in turns leads to less lending and widespread effects throughout the economy, followed by even less bank lending.

Another possibility is that none of the affected firms suffered from fundamental weakness in their business lines, but were instead the victims of short-sellers and other miscreants who worked to destroy confidence in these financial firms. In this case, the mechanism from the financial side of the economy to the real side is illusory – the crisis affects both aspects of the economy simultaneously through the destruction of confidence. Lost confidence causes consumers to put off big ticket items and to move their savings into very safe products, reducing the amount of capital available for new projects. The drop in confidence also reduces forecasts of business profitability, leading to fewer new business starts and reduced investment among existing businesses. The net effect of all these pullbacks leads to a smaller economy. Such a

situation could occur with equal likelihood were the initial incidence of distress a large nonfinancial firm such as General Motors, or a financial firm such as Bear.

Although short-sellers have an incentive to repeat hurtful rumors about a company and destroy confidence in the firm, they do not work in a vacuum. At the same time that they are encouraging pessimism, the management and the existing shareholders are trying to spin a story of optimism. Management and equityholders have an incentive to pass off the company as healthier than it really is because both parties want the firm to continue as a going concern. Management is fearful of losing their jobs so they neither wish to allow the firm to cease operations as an independent entity nor to own up to mistakes if such honesty makes it more likely they would lose their jobs (Gilson (1989)). Equityholders want the firm to continue so that their stock has a chance to come back to a reasonable level (Geske (1977)). If the firm files for bankruptcy, the odds of a substantial payout to shareholders are quite low, but shareholders still attempt to gain value at the expense of creditors by putting off the final day of reckoning, in hopes that the franchise value will improve in the meantime (Wruck (1990)). This delaying strategy is more effective for large nonfinancial firms in bankruptcy because the U.S. code presumes reorganization will occur for these firms. In contrast, Chapter 11 cases for financial firms are more often a form of liquidation, which means equityholders are far more likely to have their claims cancelled in bankruptcy. In other words, bankruptcy is harsher for equityholders and management if the firm's business involves the management of financial assets. As we noted before, harsher bankruptcy rules encourage more out of court workouts. In the case of a bank, an investment bank or an insurance company, capital regulations require that the firm show not just solvency but a level of solvency that exceeds a regulatory minimum. If the firm can stave off the day when it acknowledges a deficit in this regard, equityholders and

management benefit from the option to delay. The obvious way to avoid recognizing a lack of capital when credit losses arise is to obfuscate the true condition of the portfolio – if the portfolio were fine, there would be no need to exaggerate its health, but for underwater assets admitting the truth is tantamount to ending the option to continue. In sum, while short-sellers have a great incentive to exaggerate the problems of the firms in hopes of driving down the stock price, the incentives for management and shareholders are even greater to overstate the health of the firm as it approaches financial distress.

Throughout much of 2008, short-sellers were blamed for driving down financial firm stock prices and the SEC went so far as to outlaw short-selling of financial firms stocks for several months. The logic of this action was that calling attention to risky firms is sufficient to drive their stocks down to the point of financial distress. In hopes of cancelling out these forces, the SEC essentially tried to eliminate the opportunity to express a negative view on a financial firm. For such a strategy to make sense for the economy, the regulators must decide that some firms have sound businesses but are under (undeserving) attack. Management and equityholders will try to convince regulators that their firms deserve more time to regain their footing, but this puts regulators in the unenviable position of identifying truly worthy firms at a time when all the owners and management are trying their best to put a positive spin on the situation and the market is sending the contrary message.

The case of Lehman in 2008 suggests that regulators are heavily influenced by these claims of fundamental soundness. Immediately after the Bear/JP merger, investors reacted by asking "Which firms look like Bear?" and attention immediately gravitated to Lehman. The two investment banks had a lot in common: extremely high leverage, failure to take advantage early

on to raise capital, large exposure to credit risk, and heavy reliance on funding that could quickly disappear in a pinch. Rather than put pressure on Lehman to replenish its capital, the SEC continued to act as if the firm had met its requirements for minimal capital and liquidity. And, the Fed allowed Lehman to avoid the consequences of outflows by sophisticated investors by offering to lend at below market rates through the discount window. The fact that Lehman still could not continue as an ongoing concern for more than six months after receiving such extreme assistance is evidence that regulators took action to help what was essentially an unsound business. Would they have stepped in to help had Lehman management stated that the firm was economically insolvent? Only after months of observing a clear downward trajectory did the Fed abandon the idea that Lehman was a fundamentally sound business and allow them to enter bankruptcy unimpeded.

Furthermore, assistance to a financial firm with a doubtful portfolio may have little positive impact on the market as a whole. There is little that regulators can do to convince investors that the portfolio is actually sound, which in turns means assistance in the case of information contagion does not have many positive spillover effects. Even injecting capital directly into the insolvent institution is ineffectual because investors are not privy to the information that would allow them to judge that the problems have ended. Japan's Lost Decade is a good example of this situation: When the government of Japan injected 900 billion yen worth of capital into Daiichi-Kangyo Bank in 1999, the firm wrote down assets by a nearly equal amount. Investors immediately wondered if the bank would have written down losses of one trillion yen if the government had injected another 100 billion of equity into Daiichi. Not surprisingly, the banking woes in Japan continued for several more years after the capital infusion. Similarly, assistance to AIG in September 2008 did not reveal the full extent of its

losses and its troubles continued, resulting in a new bailout with more lenient terms less than two months later. In contrast, allowing the distressed firm to enter bankruptcy initiates a process of evaluating the firm's assets that would not begin outside of bankruptcy (i.e., as long as equityholders in the financial firm focus on the option to delay and disavow insolvency).

The only comparable alternative to bankruptcy that would simultaneously eliminate the equityholder's incentive to obfuscate and which would remove further doubts about the quality of the portfolio would be an assisted merger. If the merger is FDIC-assisted, this is nearly equivalent to a financial firm bankruptcy. If the merger is assisted in a less explicit framework, such as the New York Fed stepping in to assist LTCM or the Treasury and the Fed stepping in to assist Bear with the JP merger, then the problem of the equityholder option to delay is eliminated but investors learn little about the portfolio (except that is very bad) and that it may now reside with the merger partner. Bankruptcy shines a light on these bad assets whose value would otherwise remain extremely murky. Reducing the uncertainty surrounding the bankrupt firm's assets allows investors in other firms to better understand those assets and thus reach a bottom in terms of financial distress. Without a full understanding of the losses in the portfolios, these firms are unlikely to move forward and receive sufficient support from investors to allow them to make more loans.

III. Past Financial Firm Failures

Intervention in a financial crisis may be warranted to avoid systemic risk, but it may also be unproductive if it fails to stem subsequent troubles and mainly serves to send a message that excessive risk taking will be supported by the government. The benefits of intervention are

difficult to gauge when we cannot know the counterfactual – what if Bear had been allowed to file for bankruptcy? What if AIG went back to its largest shareholders for equity instead of taking a Fed loan? Many who favor intervention point to the Lehman bankruptcy as a glaring mistake that caused a massive downturn in financial markets and proof of the usefulness of TBTF policy. Unfortunately, the sharp downturn in financial markets that followed Lehman's Chapter 11 is hard to attribute to that bankruptcy filing given that news of AIG's troubles came out at the same time. Lacking the counterfactual for these instances, we instead focus on past financial firm failures to see how they affected the economy. Next we consider the cases of Finova, Drexel, and Bank of New England (BNE).

Although quite large, Finova was not a complex financial firm. At one time a captive finance subsidiary of Greyhound Bus, over the years Finova became a stand-alone entity that specialized in credit to middle market firms. Finova raised capital for its business from bank loans and public bonds. Finova's troubles lay in its rapid growth (fivefold over a seven year period) and, as became apparent later, relatively weak underwriting standards to a fairly concentrated group of firms. By the time of its bankruptcy filing in March 2001, Finova's liabilities consisted of more than $11 billion in bonds and bank debt (its largest single debt was a loan made by Bank of America for $295 million). Because it had neither deposits nor securities accounts, Finova was free to file for Chapter 11 bankruptcy protection and involve all of its business in the reorganization plan. Although technically Chapter 11 is designed as an avenue for restructuring, in the case of financial firms the odds of leaving Chapter 11 in tact are quite low. Not surprisingly, then, Finova's Chapter 11 case was never a path to reorganization, but rather a plan to liquidate. From the onset of the case, Finova shut down its underwriting operations, and the firm's employees were retained only for the purpose of servicing existing

loans and providing information for the bankruptcy. Despite the immediate drop in economy-wide credit from an $11 b. financial institution, no federal regulator expressed a concern for the spillover effects of Finova's filing nor was there any doubt that TBTF did not apply to this firm. Its filing did not elicit concern from regulators about the impact on Bank of America, or other creditors such as Chase, Credit Suisse and Bank One, presumably because the risk of counterparty risk, as is typical for these diversified creditors, was minimal. Finova did not owe much money to retail investors, so there was no discussion of a lack of confidence in the capital markets. Its most prominent borrowers, the vacation time share firms and airlines, were already in a slump and few would have argued that the drop in credit to these sectors would trigger a financial accelerator effect – it was clear the firms were in no position to expand their investments had their borrowing capacity suddenly shot up.

Finova is a textbook example of the plodding process of bankruptcy whose sluggishness reflects the back and forth between creditors over how to maximize the size of the pie, and if not already clear, how to divvy up that pie. Finova filed for Chapter 11 in March 2001 and exited bankruptcy in August 2001. However, that short time period in bankruptcy was not an indication of rapid liquidation. They simply exited Chapter 11 with a plan to liquidate all assets and pay off creditors. The time spent in bankruptcy was mainly spent debating how to best liquidate the firm: Some among them were convinced that the liquidation would go most successfully if it were carried out by someone with strong bargaining power and great expertise in financial valuation, such as Warren Buffett. Others thought those factors were important but that the main concern was the price charged for such expertise – if the management fee ate up all the extra increase in asset sales prices, then the creditors would be no better off. As the debate raged as to how to dispose of the assets, none were sold. Eventually, the creditors were convinced of a

particular plan for liquidation and the firm exited Chapter 11. However, leaving Chapter 11 in August 2001 was not the end of its period of distress, but merely the beginning of the end as it slowly sold off its portfolio. As of its latest 10-K filing (recorded with the SEC in March 2009), the company was still in the process of disposing of its assets in an orderly fashion.

Finova's experience with liquidation under the aegis of the bankruptcy court is instructional in light of the common perception of bankruptcy articulated by regulators. As an example, consider Alan Greenspan's testimony to Congress[10] in defense of the Fed's actions to bail out LTCM. Noting the effect of the Russian default a few months previous to the collapse of LTCM, Greenspan stated "financial markets were already unsettled by recent global events." Thus he believed that "had the failure of LTCM triggered the seizing up of markets, substantial damage could have been inflicted on many market participants, including some not directly involved with the firm, and could potentially have impaired the economies of many nations, including our own."[11] How might LTCM's collapse lead to systemic risk? Apparently that mechanism hinged on excessive pressure to quickly dispose of assets in bankruptcy, as Greenspan goes on to testify that "our sense was that the consequences of a fire sale triggered by cross-default clauses, should LTCM fail on some of its obligations, risked a severe drying up of market liquidity…. [and] that it was to the advantage of all parties…to engender if at all possible an orderly resolution rather than let the firm go into disorderly fire-sale liquidation." Greenspan viewed the Fed-orchestrated bailout as the only way to avoid bankruptcy and thus a disorderly liquidation. Likewise, Bernanke cited the same risk of disorder as a rationale for the Fed's intervention in the business of AIG:

[10] Testimony to the House Committee on Banking and Financial Services, October 1, 1998, entitled "Private Sector Refinancing of the Large Hedge Fund, Long-Term Capital Management."
[11] See Dowd (1999) for a detailed description of the LTCM bailout.

> "In the case of AIG, the Federal Reserve, with the support of the Treasury, provided an emergency credit line to facilitate an orderly resolution. The Federal Reserve took this action because it judged that, in light of prevailing market conditions and the size and composition of AIG's obligations, a disorderly failure of AIG would have severely threatened global financial stability, and consequently, the performance of the U.S. economy."[12]

While the Fed views the bankruptcy process as inherently disorderly, empirical evidence suggests otherwise. Ironically, many creditors have complained that the process is too slow as judges often look for a way to salvage assets that truly ought to be liquidated (e.g., Weiss (1990)).

In the case of Finova, a devil's advocate might point out that the firm did not fall into the category of TBTF and thus its liquidation would by definition go smoothly. This is a difficult claim to dispute, given that regulators have not precisely articulated TBTF policy. Not only do we always face some doubt as researchers as to what constitutes "big enough" to warrant intervention, but this doubt is intentionally engendered by regulators as a way to minimize the impact of TBTF on moral hazard problems. Stern and Feldman (2006) argue that this problem is best solved by convincing creditors of banks that they truly are at risk of loss – "convincing creditors that their bank is not too big to fail (TBTF)."

Regulators seem to have taken this advice to heart in the case of Drexel, which filed for bankruptcy in February 1990, within days of approaching regulators for assistance in hopes of a bailout. According to Herring (2003), the problems at Drexel were mainly at the holding company, Drexel Burnham Lambert Group (DBLG), whereas the regulated broker/dealer subsidiaries, Drexel Burnham Lambert (DBL) and Drexel Burnham Lambert Government Securities (DBLGS), and the commodities and foreign exchange group, Drexel Burnham

[12] See testimony to Committee on Banking, Housing and Urban Affairs, U.S. Senate Sept .23, 2008.

Lambert Trading Corporation (DBLT), were well capitalized entities. Turmoil in the junk bond market (due to higher defaults, S&Ls being forced to sell their portfolios, and, possibly, the forced departure of Milken), as well as lower capital from having paid hundreds of millions in fines to the SEC penalties, was putting downward pressure on the entire operation, particularly at DBLG, which was having trouble continuing to fund its junk portfolio in the commercial paper market. As an attempt to stave off distress, DBGL started upstreaming funds from its subsidiary, DBL, claiming that the funds were excess capital. If Herring is correct that the subs were well capitalized, then these funds were indeed excess capital. However, the SEC and other regulators had a more pessimistic view of DBL's capital, so when they learned of the outflows of cash from DBL to DBGL, they viewed it as having enormous potential to cause distress to the broker/dealer's customers. If DBL was overstating its capital by understating the losses on its junk bond portfolio, then DBGL was upstreaming cash that would serve as a buffer in the liquidation by SIPC of the DBL's accounts. The SEC stepped in and halted transfers from DBL to DBGL, forcing DBGL to default on its debts and file for bankruptcy within a week.

Unlike Finova, many of Drexel's assets were fairly liquid securities and quickly wound down. In addition, many of the assets resided with the subsidiaries, which did not file for bankruptcy. Within days, the customer accounts at DBL were transferred to Smith Barney. The firm had been a market maker in over 200 equities, and quickly sold off its inventory, with other market makers taking up the slack. Drexel had a derivatives book of $30 billion notional value. Because derivatives, repos, futures and similar contracts are exempt from the bankruptcy process (they can continue to trade, or if they are under an International Swap Dealers Association (ISDA) contract they likely will automatically terminate upon bankruptcy), and because the broker/dealer subs did not enter Chapter 11, these contracts were wound down outside of

bankruptcy over a short period of time. The Bank of England stepped in to ascertain that the DBLT positions in currency markets were liquidated in an orderly manner and the Federal Reserve Bank of New York helped to unwind the derivatives.[13] All of the liquid securities were converted to cash, while the illiquid junk bond portfolio remained with Drexel for more than a year in bankruptcy.

Although Drexel was described prior to bankruptcy as a firm with more than $40 billion in assets, in its bankruptcy filing Drexel only listed assets and liabilities of less than $4 billion each. This reflects the fact that much of the actual business of Drexel did not enter Chapter 11 and the fact that many financial contracts, such as derivatives, are exempt from the bankruptcy process. Compared to Finova, the more complicated, capital markets nature of the investment bank made its bankruptcy simpler. With the desire to avoid bankruptcy for its broker/dealer subsidiaries, which would have been instantly taken over by SIPC, and the exemptions from bankruptcy for its more complicated financial transactions, the entity that entered Chapter 11 was a stripped down version of Drexel. Yet, like Finova, there was no rush to sell off the junk bonds in a fire sale and no sense of a disorderly liquidation. Items that sold easily were sold quickly, while the less desirable assets were slowly sold off as their markets rebounded.

A third case of financial firm failure is that of the Bank of New England. As a bank holding company whose major assets were FDIC-insured depository institutions, BNE's case reveals much less about how an unregulated financial institution's bankruptcy might transmit systemic risk. However, as a holding company, BNE was involved in operations that were

[13] Interestingly, in the more recent Lehman filing, the ISDA held a four hour netting session just before the firm filed for bankruptcy to reduce the number of contracts outstanding. This suggests the role of the Federal Reserve in future financial firm bankruptcies will be even smaller.

representative of financial institutions in general. In particular, at the time of its failure, BNE had a derivatives book with a notional value of $30 billion, mainly related to foreign exchange rates and interest rates. According to Peek and Rosengren (1997), this placed BNE among the top fifteen largest commercial banks in terms of foreign exchange derivatives and in the top twenty for interest rate derivatives in the first quarter of 1990, about a year before its failure. Over the 12 months leading up to its seizure by the FDIC in January 1991, the bank was deteriorating due to losses on real estate. A new chairman, Lawrence Fish, was brought in to manage the bank in February 1990, after having reported losses of more than $1 billion. In October 1990, *Institutional Investor* magazine predicted that BNE would "become the next major U.S. bank failure." Clearly, this bank was on the brink of insolvency if not actually insolvent in the year leading up to actual takeover by the FDIC, so one might expect that such a large derivatives position might have sent BNE over the edge or that its demise might at least cause massive losses on those positions. Under no circumstances could anyone describe the FDIC seizure as sudden, indicating that the derivatives markets had many months to consider the impact of a BNE bankruptcy on the system and to reconsider the benefits of continuing to trade with BNE. Its failure resulted in minor losses in the derivatives market and no discernible dip in the explosive growth of the interest rates swaps market in the early 1990s.

IV. Policy Responses

The appropriate policy response of the regulators depends in large part on the nature of the crisis. If one firm's distress is truly likely to bring on the collapse of a multitude of other firms via direct business ties, then intervention to assist that one firm is appropriate. Prior evidence suggests that financial crises are rarely of that ilk in the U.S. More often, financial

crises involve many firms who share common characteristics, whether it be a concentration of assets in certain sectors of the economy such as real estate or a common reaction to high interest rates or a shared problem with fraudulent accounting. In these cases, the appropriate policy response would attempt to affect a broader constituency, and potentially allowing a small fraction of the firms to fail without any assistance. Those failed firms should enter a legally sanctioned liquidation process such as Chapter 11 that allows their assets to be sold off in an orderly piecemeal procedure. Past experience shows us that the liquid, more desirable assets are frequently sold off quickly to prevent them from dissipating value (especially those involving former employees of the failed firms). In contrast, the less desirable assets are often sold off slowly, as investors need time to evaluate their truth worth and bankruptcy participants attempt to maximize recovery values by waiting for temporarily distressed assets to rebound. These processes take time, making the prospect of a fire sale quite unlikely. In contrast, assisted mergers are typically done in haste, with the result that firms like Bear are forced into the arms of JP over the course of only a weekend, making it much more likely that the transaction will involve an imprecise valuation based on extremely limited due diligence. Mergers like the Bear/JP deal are examples of fire sales, not paths to avoiding them.

Although we can rule out assistance to firms based on the theory that they will cause a domino effect, regulators may decide that the most useful course of action is to help out an entire sector of the economy. The logic is that one sector of the economy is no longer functioning properly and the lack of liquidity and stability in that market is hurtful to the entire economy. In the case of commercial banks, it is easy to argue that a decline in the size of the banking sector will reduce lending in the economy overall and that this will prevent firms from financing positive net present value. Yet, our financial infrastructure is not so simplistic – helping out

large banks often hurts small banks who might otherwise have gained market share in a downturn; helping banks might hurt insurance companies who traditionally have had more conservative balance sheets; helping financial holding companies such as AIG might hurt more focused firms, such as PNC. If one area of the financial sector suffers a meltdown, regulators must be confident that its competitors are unable to step up in its place to provide the same services. And such substitutions between sectors may involve frictions, meaning that one cannot conclude that shrinkage over a few days will last indefinitely without regulatory intervention. Rather, intervention, should it be warranted, ought to come in the form of broad support for all financial intermediaries rather than for the one sector that has lost the most money.

Even assisting the financial sector as a whole involves playing favorites with financial firms that provide external debt financing. The bias is most evident in the case of home mortgages – firms that provided extreme amounts of home financing were bailed out in the name of helping homeowners who could no longer afford to service this external debt. No such help was considered for homeowners who paid cash for their houses or those whose debt servicing was lower because they purchased a more modest house. Likewise, on the corporate side, assistance to commercial banks in hopes that they will expand their commercial lending and assistance to investment banks so that it might grease the wheels of the credit markets plays favorites with firms that rely heavily on external debt financing. Further, the credit markets do not include the venture capital market, which provides external equity financing to firms. Assistance to either market does little for firms that traditionally rely on internally generated equity (i.e., profits) to fund projects. Even such generic assistance to financial markets creates the problem of moral hazard by encouraging firms to rely on external debt financing with the hope that these debts will someday be forgiven.

V. Conclusion

Financial firm failures grab headlines and often generate a sensation of panic and crisis, leading regulators such as the Fed and the Treasury to conclude they must intervene. While they try to limit the "heads I win, tails you lose" mentality of a moral hazard problem, no regulator wants to risk being on watch while the next Great Depression occurs. Researchers still debate the mechanism by which the bank failures of the 1930s caused massive losses on the real side of the economy, making it difficult for regulators to know whether their efforts to intervene are helpful to the overall economy.

While we are still not sure of the path by which financial crises are connected to the real economy, we can rule out the idea that financial firm failures spread to the rest of the economy via counterparty risk. Most firms, whether financial or nonfinancial, are diversified. We rarely see the bankruptcy of one firm causing major losses at another firm, let alone the failure of a second, third and fourth firm. Cascades can only arise when firms' loans to other firms are very large as a fraction of their capital, a notion that is both at odds with bank regulations and good business practices regarding diversification.

More likely, financial crises involving several financial firms represent commonality in their asset allocation decisions. In these cases, regulatory aid to one firm is of little use to the entire economy. Such assistance might bolster confidence, but clearly increasing confidence among all such firms is more productive than merely attempting to boost confidence in one particularly weak firm. However, confidence in the system is unlikely to be restored when investors know that management and equity have good reason to overstate a financial firm's health. Admitting that the portfolio is underwater is tantamount to the CEO asking to be fired.

Shareholders want the option to continue as a going concern, which is nearly impossible in bankruptcy and quite limited in an assisted merger. These players will argue that short-sellers are destroying confidence even when they know their firms are insolvent, all in the hopes of hanging on should their portfolios rebound. Assisting an entire sector may be rewarding poor credit analysis and preventing more efficient lenders from appropriately gaining market share. We must be sure that assistance to a particular sector does enough to prevent large real side effects that we can overlook the dilatory effects of supporting the market's least efficient participants.

The urge to intervene in such crises is great, as regulators wish to always have stable, liquid and orderly markets. Artificial stability, however, always comes in the form of propping up failed firms, as regulators never intervene to pop asset bubbles in good times. Thus, stability and liquidity achieved by crisis intervention will give the appearance of order, or at least less disorder, as the economy recovers from the shock, but only at the expense of efficiency and proper working order over the long haul. In the meantime, our financial firms have many competitors who may be able to step in to replace the lost credit supply and who may provide nearly equally desirable financial products to retail investors. Bailing out failed firms penalizes these competitors who followed more prudent strategies before the crisis and sends a message to failed firms that their failures do not prevent them from continuing in the business.

Regulators' desire to maintain stable, liquid and orderly markets is best satisfied by letting financial firms file for bankruptcy protection. The bankruptcy process allows for a much more flexible liquidation procedure than an assisted merger, as desirable assets leave the failed firm quickly while unpopular ones can be sold over months or, in the case of Finova, even years.

In contrast, an assisted merger puts pressure on markets as participants hastily settle on asset values that make little sense, such as the decision to price Bear's equity at $2 a share. These mergers with their extremely limited analysis of the financial firm's portfolio, the desire on the part of the buyer to extract value from the regulators, and the desperately short time horizon imposed on the seller are tantamount to fire sales. Fire sales in court-supervised bankruptcy cases, however, are easily avoided.

Rather than stepping in to cure a particular financial firm's problems, possibly at the expense of other, more prudent financial competitors, policy should aim for more general assistance to the economy. The more general the aid, the less likely it is to cause distortions in the various financial sectors. Unfortunately, the sense of urgency that arises in a crisis means that regulators feel compelled to come up with a solution in a matter of days, which ordinarily excludes fiscal policy as a major weapon in the arsenal, given that Congress is not able to act as fast as the Fed or Treasury. However, if financial regulators allow financial firms to enter bankruptcy and slowly wind down their distressed portfolios, they could in the meantime press Congress to implement broader-based recovery strategies.

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