

*Conventional wisdom overstates the risk of contagion
and the chaos of bankruptcy.*

Financial Firm Bankruptcy and Systemic Risk

BY JEAN HELWEGE

Pennsylvania State University

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 and good projects will not be undertaken. Such pervasive financial fragility may occur because one firm's failure causes a cascade of failures throughout the system. 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.

Regulators worry about the next Great Depression and the possibility that financial firm fragility will cause it. Thus they rely heavily on "too big to fail" (TBTf) policies, which they believe stem the impact of one firm's problems on other financial institutions and therefore on the whole economy. 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 the bailout actions have been overestimated, then the cost in efficiency from TBTf policies may far outweigh any potential benefits from attempting to avoid another Great Depression.

No doubt, no regulator wants to take the chance of appearing passive while watching over another depression, so we do not observe empirically what happens to the economy when regulators back off. However, we can analyze how financial crises spread to the real economy and study the related empirical literature. We focus on two types of contagion:

Information contagion: The information that one financial firm is troubled results in negative shocks at other financial institutions largely because the firms share common risk factors

Counterparty contagion: One important financial institution's collapse leads directly to problems at other creditor firms, whose troubles snowball and drive other firms into distress.

The efficacy of TBTf policies depends crucially on which of those two types of systemic risk mechanisms dominates. Counterparty contagion may warrant intervention in individual bank failures, while information contagion likely does not.

If regulators elect not to bail out a failed financial institution, the alternative is to let it go bankrupt. In the case of a failed commercial bank or other depository institution, the process involves the Federal Deposit Insurance Corporation as receiver and the insured liabilities are very quickly repaid. 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 has liabilities that are covered by the Securities Industry Protection Corporation, the firm is required by law under the Securities Industry Protection Act (SIPA) to liquidate under Chapter 7. This explains in large part why only Lehman Brothers' holding company filed for bankruptcy and not its broker-dealer subsidiaries.

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 firm, and the fire

Jean Helwege is an associate professor of finance in the Smeal College of Business at the Pennsylvania State University.



sales will have ramifications for other firms in related businesses, even if companies in those businesses do not have direct ties to the failed firm. (See Shleifer and Vishny (1992).) This fear was behind the Fed's decision to extend liquidity to primary dealers in March 2008. As Fed chairman Ben Bernanke explained in a March 13, 2008 speech on financial system stability:

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.

In the same speech, Bernanke cites the concern of a possible fire sale in explaining why the Fed pushed for the hasty merger of Bear Stearns and JP Morgan:

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 bankrupt-

cy 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....

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 embody 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 the operation of a bankrupt firm, the laws allow for a reorganization of the firm. Admittedly, there is a prejudice against reorganization of financial firms because of concerns about allowing fraudulent securities sales to continue unhampered, but there is certainly no prejudice against selling assets in an orderly procedure that maximizes the value to creditors.

Bankruptcy actually reduces the likelihood of fire sales because assets are not sold quickly once a bankruptcy filing occurs. Cash does not leave the coffers of a bankrupt firm without the approval of a judge. Without pressure to pay debts, the firm can remain under bankruptcy protection 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. (See Wruck (1990), Bebchuk and Chang (1992), Weiss (1990), Bradley and Rosenzweig (1992), and Weiss and Wruck (1998).) If, however, creditors and management believe that speedy asset sales are in their best interest, then they can press the bankruptcy judge to approve quick action, as occurred with Lehman's asset sales to Barclays. Concerns that a bankrupt firm will be forced into a fire sale are unwarranted given that bankruptcy laws are set up to allow time for an orderly disposal of assets.

The case of Finova illustrates well how the bankruptcy process would progress for a distressed financial firm. Finova's previous success at underwriting middle-market loans was clearly in the past when the firm entered bankruptcy in 2001, so its creditors were focused only on how best to liquidate the loan portfolio. After a few months in bankruptcy, Finova emerged from Chapter 11 in August 2001 with a plan to liquidate the business and pay out the proceeds to its creditors over time. For Finova, the end of Chapter 11 was not the end of its distress, but merely the beginning of the end as it slowly liquidated. As of its latest 10-K filing (December 2008), the company was still in the process of disposing of its assets in an orderly fashion. No doubt the unwinding of Lehman will also take considerable time, as it also did with Drexel.

THE NATURE OF FINANCIAL FIRM FAILURES

In order to see the potential benefits of various regulatory responses to a financial crisis, including that of allowing bankruptcy, we must first consider the causes of financial firm distress. The appropriate policy response weighs the tradeoff between preventing systemic risk and preventing an atmosphere of reliance on government handouts. That tradeoff 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. For example, if we observe 10 failed banks that suffered from counterparty risk, we can draw a line connecting each one's liabilities to the failure of another in the set. With information effects, there is no such line; instead, all 10 banks share a set of risks in their portfolios. Even if none is a creditor in the others' bankruptcies, all 10 will experience distress simultaneously (or at least within the same short time period) because all 10 invested in the same types of assets, which now have substantially lower values. We refer to this as "information contagion" because frequently the 10 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.

COUNTERPARTY CONTAGION In a case of counterparty con-

tagion, the initial bank gets into trouble and the other banks become distressed as a result. 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 testimony to the Senate Banking Committee, Bernanke described Bear Stearns' situation as "extremely complex and interconnected." He explained further:

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 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...agreed to provide funding to Bear Stearns....

In such a case, the interconnectedness of the two financial firms makes it highly unlikely that the 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 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 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 cause most financial crises.

The extent to which this situation causes systemic risk 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 allow bankruptcy. Studies by Larry Lang and Rene Stulz (1992), George Theodorides (2008), and Phillippe Jorion and Gaiyan Zhang (2007) examine the effects on stock prices, bonds, and credit default swap rates, respectively, of other firms in the industry when a bankruptcy occurs. If counterparty effects on suppliers are very large, stocks and other securities in the industry should experience a severe drop in value

upon the announcement of the initial bankrupt firm. While studies find statistically significant effects, the relatively small impact suggests that other firms in the bankrupt companies' industries do not collapse in a cascading fashion. Michael Hertz et al. (2008) examine suppliers and customers of the distressed firms using 10-K filings and find that customers are not affected by the bankruptcy, but suppliers are. However, the average effect for suppliers is less than 2 percent of the market value of equity, hardly enough to start a cascade of failures.

Jorion and Zhang (2008) specifically focus on the issue of counterparty risk and find that the effects are remarkably small. They study the bankruptcy claims owed to the top 20 unsecured creditors to determine if bankruptcy causes a cascade of failures. Most of the firms in their sample are nonfi-

with its \$7.4 billion capital base.

Jorion and Zhang find this situation is quite common, as the largest claim in their sample, held by Citibank, is only \$1.75 billion — a small fraction of Citibank's portfolio. No financial firm debtor had a claim in their sample exceeding 2.4 percent of its market value, and the average was substantially smaller. 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. It is not surprising, then, that the bankruptcies in Jorion and Zhang's sample rarely triggered a cascade of subsequent bankruptcies: Of the 251 initial bankruptcies, only 22 creditors in the sample delisted within two years. The problems at those 22 creditor firms can hardly be

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nancial entities, which should have more counterparty risk than financial firms as they are more likely to have extremely dependent suppliers. 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 we expect the supplier to sell its 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 sale 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 15 percent of the bank's capital. 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 the entity's top 20 creditors would have a very large portion of their assets tied up in the failed firm. 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 \$463 million — less than one tenth of one percent of the claims in Lehman's filing. This loss was hardly large enough to bring down Aozora

described as part of a cascade of counterparty failures because no other firms failed as a result of their problems.

Counterparty risk involving credit default swap (CDS) dealers is often cited as a reason to establish a clearinghouse for CDS contracts. The fear of defaulting CDS contracts involving Bear and AIG were strong factors in the Fed and Treasury Department's decision to apply TBTF policy to them. However, buyers of CDS contracts can easily diversify across dealers and often do so. Moreover, once counterparty risk in a CDS contract becomes extreme, the buyer can undo the risk immediately by entering into another CDS contract with an offsetting position. Setting up a clearinghouse is unlikely to prevent a systemic risk crisis in the future.

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. Those 10 firms rarely had strong business ties to each other — Lehman's bankruptcy filing did not list any of the firms as major creditors. Rather, the 10 firms share a common exposure to the mortgage market. Thus, when Bear Stearns failed, the major effect on the market was to trigger a reevaluation of other financial firms' health. Not surprisingly, investors next focused considerable attention on Lehman, the most similar investment bank.

In times of financial upheaval, investors look at their portfolios with greater scrutiny and try to identify securities that have something in common with those of the failed firms. The

common factors in these episodes may be related to industry, such as the collapse of oil prices in the mid-1980s, or it may be a common problem regarding the reliability of accounting information, as in the case of Enron. Many firms can be exposed to some risk factor and when that factor moves in such a way as to cause a drop in asset values, all the financial firms suffer. Some are more exposed than others, and we expect those firms will be among the first to become insolvent. Thus, when we observe 10 firms enter distress, 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 the first 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. Those investors then trade in the marketplace on this new information, leading to updated valuations of the securities associated with the other firms.

Empirical studies of past failures suggest information effects are extremely important. Lang and Stulz (1992) find that stock market reactions to nonfinancial firm bankruptcies are often negative, reflecting investors' revaluations of assets in that industry. Similar results are found in Jorion and Zhang (2007, 2008) and Theocharides (2008). Pierre 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 event directly concerned the other bonds.

Regardless of the nature of the common factor that causes various negative shocks, it is quite ineffectual to apply TBTF policies to the first failed firm when information contagion is involved. Helping out this firm, which has no ties to the other firms, does nothing to improve the other firms' balance sheets. Helping out the first defaulting firm will have no effect on the losses incurred by the second, third, and fourth firms to default, if those firms have no business ties to the first firm. In contrast, if the government were to use the same money to support all of the affected firms, all the firms would benefit and they may 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? Milton Friedman and Anna Schwartz (1971) 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. Without a concomitant reduction in prices, the quantity of goods produced in the economy will drop.

Bernanke (1983) argues that those effects are unlikely to be the whole story because the magnitude of the decline in the real side (prices and quantities) of the economy is proportionately larger than the decline in the money supply. Instead, he claims that the financial system carnage relates to the real side through the cost of intermediation. In his view, negative

shocks to financial firms work their way through the system because banks pull back in their lending. That, in turn, leads to less investment in the economy and weaker prospects for economic activity.

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 who drove down the firms' values in order to reap financial rewards. 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. However, though 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, management and 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 they don't want the firm to liquidate. Shareholders attempt to gain value at the expense of creditors by putting off the final day of reckoning in hopes that things will improve in the meantime. The obvious way to delay acknowledging insolvency 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.

Regulators often buy into management's claims of fundamental health in justifying TBTF assistance, but investors are not so easily convinced and the aid has few 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 determine that the problems have ended. Japan's Lost Decade is a good example of this situation. When the government of Japan gave Daiichi-Kangyo Bank 900 billion yen 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 infusions.

POLICY RESPONSES

Given our reasoning above, we can rule out the notion that policymakers must prevent financial firm bankruptcy for fear that one firm's failure could result in a domino effect across the sector. However, regulators may decide that a useful course of action is to help out an entire sector of the economy that is suddenly reeling from information contagion. 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 projects with 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.

Likewise, 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 should not intervene unless they are confident that other firms are unable to provide the same services as the damaged firms. If intervention is warranted, it should 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 at the expense of firms that rely on internally generated profits or external equity 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.

CONCLUSION

Financial firm failures grab headlines and often generate a sensation of panic and crisis, leading regulators such as the Fed and Treasury to conclude that 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 asleep at the switch when the next Great Depression occurs.

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 those cases, regulatory aid to one firm is of little use to the entire economy. 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 to offset the dilatory effects of supporting the market’s least-efficient participants.

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 an orderly liquidation. 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. Ordinarily, that 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. **R**

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