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Cover Page Footnote
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The Early Phases of the Financial Crisis: Reflections on the Lender of Last Resort

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Abstract

This essay discusses the powers and limitations of the Federal Reserve's role as Lender of Last Resort and how it deployed those powers during the financial crisis of 2007-2009. It considers the Fed's authorities and the frameworks that it relied on in utilizing its powers to calm markets in turmoil and to assist specific financial institutions.

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Introduction

In May of 2008, the U.S. financial crisis was almost a year old, but it was in a sense only beginning to get scary. We were somewhere between Bear Stearns and Lehman. The actions in March by the Federal Reserve with the support of the Treasury to help contain the damage from Bear Stearns had slowed the ongoing “run” on the U.S. financial system but had not arrested it.

Over the late spring and summer, fear of recession intensified, house prices fell further, and defaults on mortgages increased, adding to fears about the viability of the rest of the financial system. This was a period when the gap between our ends and our means was the widest in the crisis.

Most of the burden for containing the growing risks during these months between February and October of 2008, the period before Congress passed emergency authority to recapitalize the financial system and expand the scope of the FDIC’s guarantees, was left to the Federal Reserve’s lender of last resort authority.

As a result, this is a valuable period to understand both the power and the limits of the lender of last resort in a financial crisis. What problems in a financial crisis can the lender of last resort help address, and what problems lie beyond the scope of those tools? What defined the limits of the Fed’s emergency authority? Why lend beyond banks? Why was the Fed able to help save Bear and AIG, but not Lehman?

Bagehot’s classic framework for the lender of last resort was elegantly simple. His prescription reduced over time to its essence was that, in a crisis, the central bank should *lend freely against good securities at a penalty rate*.

“A panic,” Bagehot wrote, “in a word, is a species of neuralgia, and according to the rules of science you must not starve it. The holders of the cash reserve [the central bank] must … advance it most freely for the liabilities of others. They must lend to merchants, to minor bankers, to ‘this man and that man,’ whenever the security is good. In wild periods of alarm, one failure makes many, and the best way to prevent the derivative failures is to arrest the primary failure which causes them.”

Bagehot’s framework by itself, however, does not provide an adequate guide for many of the key questions policy makers face in a financial crisis: How broadly should the central bank lend? How much risk should the central bank take? How much damage should it try to mitigate? The simplicity of Bagehot’s framework is also challenged when applied to our more complex financial system where banks are not overwhelmingly dominant, and *non-banks* as well as direct funding markets play a key role in the provision of credit to the economy.

Although the focus here is on actions within the Federal Reserve’s authority, Secretary Paulson and the U.S. Treasury played a key role in helping shape our overall strategy throughout this early period. We consulted closely as the crisis intensified, we worked closely together in trying to prevent the failures of the investment banks and AIG and to address problems in the broader funding markets, and we explicitly sought the written support of the Secretary of the Treasury in using our emergency authority in the Bear Stearns and AIG interventions.

In this crisis, as in most, we were forced to go well beyond Bagehot. Ultimately the U.S. government had to deploy a much broader arsenal of emergency authorities, including guarantees and capital, to break the panic and prevent the collapse of the financial system. The challenges we faced in this phase of the crisis, before we were able to deploy those more powerful tools, provide a valuable prism through which to assess the post crisis reforms to the lender of last resort and emergency powers of the government.

This essay is organized as follows:

1. Observations on the Fragility of Financial Systems
2. The Structure of the U.S. Financial System on the Eve of the Crisis
3. The Limits of the Pre-Crisis Emergency Financial Authorities in the United States
4. The U.S. Response in the Early Phases of the Crisis
5. A Framework for Escalation
6. Interventions for Specific Financial Institutions
7. Lessons from This Phase of the Crisis
8. An Assessment of the Emergency Authorities Going Forward: Where Do We Stand Today?

1. Observations on the Fragility of Financial Systems

Financial systems are inherently unstable and vulnerable to runs. And the U.S. financial system was particularly fragile on the eve of the crisis.

Financial systems are fragile because they exist to meet two important economic needs—the need for people and businesses to have a place to hold cash to which they can have access on demand and without fear of loss, and the need to be able to borrow to finance longer term endeavors that involve risk. Banks, and entities like banks, exist to provide both functions, issuing “risk fee” liabilities like deposits to finance “risky” things like loans. This role—transforming something that needs to be perceived as safe and liquid into something that is neither—is fraught with risk. If people decide they need the cash because they fear for its safety, banks do not have the ability to immediately take back the funds they have lent out. This creates the danger of runs and panics, which can threaten the stability of the financial system and cause severe recessions.

To mitigate this risk, policy makers in modern economies have tried a changing mix of prudential regulations and the safety net to reduce the probability that things go wrong. This is hard to get right. You can get a sense of the complexity of this challenge in the tragic history of financial crises and the recurrence of financial panics and deep recessions.

The challenge of building a financial engine that works under the most exacting conditions is about the design of the regulatory constraints on risk and the safety net for when those defenses fail. The prudential limits or "defenses" are not built—even at the much higher levels required today—to be sufficient to prevent failures of *any* individual "bank" or to prevent *any and* all financial crises. This is necessarily the case because to build a prudential regime where there was no risk of failure would prevent banks from being able to engage in maturity transformation and lending. The capital regime assumes the existence of a safety net for the extreme crisis—a set of protections from the central bank and the government that includes deposit insurance, funding from the lender of last resort, government guarantees, capital injections, nationalization, or special bankruptcy type regimes for failing institutions, and a Keynesian arsenal of fiscal and monetary policy tools to limit the severity of recessions.

2. The Structure of the U.S. Financial System on the Eve of the Crisis

In the decades before the crisis, the United States financial system had gradually outgrown the various protections that had been put in place after the Great Depression. These protections—a combination of limits on risk and a safety net composed of deposit insurance and routine access to loans from the Fed—applied only to depository institutions. Over time, the commercial banks had lost their dominant share of the financial system. (Financial Crisis Inquiry Commission 2011).

In 2007 they were slightly less than half of the financial system. The rest of the financial system—investment banks, money market funds, large financial firms like AIG and GE Capital, large government sponsored mortgage firms—operated outside these protections and oversight, without effective constraints on risk or the protections of the bank safety net.

The financial system had financed a decades-long rise in household debt and helped fuel a long rise in house prices. When the housing boom crested and fears of the coming recession intensified in late 2006, a large part of the U.S. financial system looked vulnerable.

This fragility had built up over a long time but it had been masked by a long period of economic and financial stability. It was a reflection of the broader imbalances in the U.S. economy. It had been fed by a set of "beliefs" that funding would remain readily available, that future recessions would be modest, that house prices would never fall at a national level, and that the low level of losses in past recessions was a good guide to future losses in the financial system.

Over time, risk had migrated around the regulatory constraints that applied to banks, and the market share of the banks declined, and the relative importance of the rest of the system increased. The supervisory system had not evolved with the market.

Banks were subject to a complex regime of capital requirements and prudential regulations; no equivalent system of constraint on leverage was applied to the rest of the financial system. These different parts of the U.S. financial system were closely integrated, which meant weakness in one area could spread to other parts of the system.

Overall, the financial system had too little capital to provide a credible cushion against the rising estimates of losses as the crisis intensified, and the capital that existed was distributed in ways that made the danger more severe. In general, the capital cushions were thinnest where the regulations were weakest, funding was less stable, and there was less access to the safety net. The institutions most dependent on less stable sources of funding and more reliant on short term funding did not have adequate capital to reassure their creditors as the crisis intensified.

The capital regime that applied to banks, although more conservative than that which applied to the rest of the financial system, was also too thin to cover the more extreme estimates of plausible losses banks might face as the severity of the recession became more evident. And the capital in the banking system was not sufficient to allow the banking system to compensate for the failures across the rest of the financial system.

In the United States, there was no entity with the authority to safeguard the stability of the overall financial system. The provision in the Federal Reserve's mandate to foster financial stability did not come with the means to constrain risk outside the banking system. Prior efforts in the U.S. to strengthen this weak and balkanized oversight structure had foundered in part because the financial system appeared to work.

This system had proven to be pretty resilient across a range of different, relatively moderate recessions, market downturns, and financial failures. But this system was less stable, and harder to stabilize in the extreme crisis. The longer period of relative stability helped create the conditions for the more extreme crisis by encouraging the migration of risk outside the banking system to institutions that were outside the safety net.

3. The Limits of the Pre-Crisis Emergency Financial Authorities in the United States

On the eve of the crisis, the U.S. had a relatively weak set of tools in its arsenal, weak relative to the nature of risk in the system and weak relative to other major economies.

The financial strength of the United States gave us powerful Keynesian tools. Nominal short term interest rates were high enough at roughly 5 percent in the summer of 2007 to allow the Fed substantial room to lower rates as the risks of recession rose. With total debt of the Federal government at roughly 40 percent of GDP, the United States had substantial fiscal room to provide temporary stimulus in the form of tax cuts and spending programs. These tools were essential to helping limit the severity of the recession, but they were not sufficient.

The U.S. financial arsenal included a well-developed safety net for banks composed of the Fed's discount window for lending to banks, the protections of the FDIC's deposit insurance scheme. Together these provided strong protections against bank runs.

Importantly, the FDIC could also intervene to manage the failure of a bank. The FDIC's resolution regime operated much like the bankruptcy regime for normal business, with the FDIC improvement that the FDIC could act as the provider of financing during the restructuring or liquidation and also as the arbiter of how to restructure or dispose of the assets of the institution. This authority included the ability, in the context of a severe financial crisis, to guarantee the liabilities of the bank or even the bank holding company, in order to prevent the failure of a bank, and limit the damage that might be caused to the rest of the financial system by a default.

These tools, however, only existed for banks, which at that time accounted for slightly less than half of the financial system. The tools available to manage weakness in the rest of the financial system were relatively limited.

In 2007, no part of the U.S. government had authority to inject capital into any bank, non-bank, or other part of the financial system. And the United States had no regime equivalent to the FDIC's resolution regime for banks to manage the failure of large *non-banks*, like investment banks or insurance companies.

The Federal Reserve could only purchase Treasuries and agency securities. Unlike many other major central banks, the central bank of the United States had only limited authority to buy municipal government securities, and could not buy corporate bonds, commercial paper, non-agency ABS, or equities, which limited its ability in a crisis to address a breakdown in those important funding markets.

The Federal Reserve did have statutory authority that could be used to provide financing outside the banking system in an emergency. This authority, which had not been used since the Great Depression, was subject to several conditions. Under Section 13(3) of the Federal Reserve Act (FRA)[2] we could lend to a *non-bank*, but only if we determined that circumstances were "unusual and exigent," if the borrower could not access other sources of

[2] 12 U.S.C. § 343 (2006). FRA Section 13(3), as in effect in September 2008, provides: "In unusual and exigent circumstances, the Board of Governors of the Federal Reserve System, by the affirmative vote of not less than five members, may authorize any Federal reserve bank, [to provide loans to] any individual, partnership, or corporation, [when such loans are] secured to the satisfaction of the Federal reserve bank: Provided, That before [providing any such loan] for an individual or a partnership or corporation the Federal reserve bank shall obtain evidence that such individual, partnership, or corporation is unable to secure adequate credit accommodations from other banking institutions." The statute does not define its key phrases, "unusual and exigent circumstance" or "secured to the satisfaction of the Federal reserve bank." (Board of Governors of the Federal Reserve). In the four years after the section was adopted in 1932, the Fed made a total of 123 loans totaling just $1.5 million. Section 13(3) was not used again until 2008, 76 years later. See also Mehra (2010) for a discussion of the Fed's usage of its emergency powers during the crisis.

funding in the market, and if the loans could be secured to our satisfaction.[3]

The Federal Reserve's emergency lending authority was powerful because it could be used to help mitigate a broad loss of funding. But it had limited effect in an extreme crisis, one that extended beyond a need for liquidity. Neither the Fed's, the SEC's or the FDIC's authority provided the ability to provide capital to or guarantee the liabilities of *non-banks*.[4]

The Limits of the Emergency Authority under FRA Section 13(3)

The emergency authority in the Federal Reserve Act limited the terms on which the Fed could provide funding beyond the banking system, even during a systemic crisis. Such funding was available only if certain criteria were met including: (i) "unusual and exigent circumstances" existed, (ii) the borrower had no access to private funding, and (iii) the loan was "secured to the satisfaction of the [lending] Federal Reserve bank." Section 13(3) provided the authority to lend to non-bank financial institutions, but not to provide capital, or guarantee creditors against loss. The defining difference between a loan and capital is that a loan is expected to be repaid, whereas equity capital provides a cushion against losses. This difference is underscored by the requirement in Section 13(3) that permits the Fed to lend only to the extent the Reserve Bank was secured as a lender—that is, the Reserve Bank had to believe that there was sufficient collateral or other protection to provide a reasonable prospect of full repayment. Because of this limitation, lending under 13(3) could not be made to carry the power of equity or a guarantee.

The law gave the Fed room for judgment on how to evaluate how much that collateral was worth, but that discretion was limited. We could decide to take a fair amount of risk, by, for example, looking at what the firm's assets might be worth over a longer time frame. We also had some discretion in deciding what margin of safety we needed against loss. This meant that we could choose to lend to an institution or an affiliate of an institution that might be on the edge of failure to allow time for a more orderly liquidation, which generally would mitigate the damage to the system, but only to the extent we had security sufficient to cover the value of our loan.

The standard interpretation of the role of funding from the lender of last resort is that lending can help reduce the risk that the strong become illiquid, but it cannot make viable the fundamentally nonviable.[5]

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[3] In 1991, the Federal Reserve Act was amended to make it clear, in the words of the committee report, that "in […] an emergency, the Federal Reserve must be able to ensure the liquidity of the financial system, including if necessary by the use of advances [loans] to securities firms" (U.S. Congress 1991).

[4] The FDIC did have authority to guarantee the liabilities of bank holding companies.

[5] Madigan (2009) discusses the Fed's crisis management in light of Bagehot's dictum—"Traditional central banking principles also tell us to lend only to solvent institutions and only against good collateral, but complying with these standards in a crisis is not entirely straightforward." Cline and Gagnon (2013) assert that "…federal officials, at least in hindsight, appear to have followed the dictum of Walter Bagehot [], which has guided central banks for almost 150 years." Posner (2016) claims that "Before the Dodd-Frank Act, the Fed was

Bagehot's dictum was that central banks should lend freely at a high rate of interest against "good" assets. He did not explicitly state that the central bank should only lend to "solvent" institutions.

The emergency provision of the Federal Reserve Act did not explicitly require a finding of solvency.[6] This acknowledged the practical reality that solvency is hard to determine.[7] A judgment of solvency depends on the value of the assets of the firm and the strength of its businesses. These depend on the distribution of expected losses. These values are difficult to determine in normal times. They are particularly hard to assess in the midst of a crisis, when funding has eroded, the value of assets has fallen steeply, and the trust and confidence necessary for a financial institution to function are eroding.

The limiting condition in the Federal Reserve Act—the ability to lend up to, but not in excess of, the value of the available security, less some margin of safety to protect the central bank from losses—limits the value of the tool in preventing the failure of a weak financial institution.

The absence of an explicit solvency test in the Federal Reserve Act has not been interpreted within the Federal Reserve to mean that the lending tools could or should be used to sustain firms that are not viable. To lend freely to the nonviable is unlikely to work. And such lending carries other risks. Among these is the risk it leaves the central bank with large losses. It could increase moral hazard risks.[8] It may take the central bank into policy areas that most deem the provenance of the fiscal authorities.

The general approach that has defined central bank practice and that certainly affected our view of what was appropriate was that the lender of last resort facilities should be available to the relatively strong, even if they were suffering the signs of illiquidity, and generally not available to those that were at the weaker extreme and thus less likely to be viable.

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understood to be the LLR for solvent banks and non-banks. FDIC was the LLR for insolvent banks. There was no LLR for insolvent non-banks. Porter (2009) argues that—"Section 13(3) grants the Fed expansive authority in 'unusual and exigent circumstances,' without requiring a stringent legal standard be met in order to respond to crises." While Mehra (2010) does not definitively conclude that the Fed's decision not to lend to Lehman was consistent with its legal authority under Section 13(3), he does concede that the decision as to the sufficiency of Lehman's collateral was a decision within its discretion.

[6] It should be noted that although the law did not require a finding of solvency then, it does now. Section 1101(a) of Dodd Frank added a provision: "The Board shall establish procedures to prohibit borrowing from programs and facilities by borrowers that are insolvent." 12 U.S. Code § 343(B)(ii).

[7] Thomas Baxter made the useful point that there are other definitions of solvency, such as a failure to pay your debts as they come due or when the level of capital to total assets falls below a regulatory minimum. See for example Heaton (2007).

[8] Henry Thornton, who wrote about the lender of last resort in 1802, before Bagehot, explained—"It is by no means intended to imply, that it would become the Bank of England to relieve every distress which the rashness of country banks may bring upon them; the bank [meaning the Bank of England], by doing this, might encourage their improvidence." (Goodhart 1999).

One last piece of this framework involves what might be called the implicit or persuasive powers of the central banks and the government.

In the financial crisis of the early 20th century, before the reforms that followed the Great Depression, the model for dealing with a dangerous financial failure was for J.P. Morgan or the New York Clearing House to convene the major banks and convince them that it was in their collective interest to help rescue the weakest among them. (Gorton 2012). The more recent example of the deft use of these powers was Bill McDonough's successful effort in 1998 to put together a consortium of financial firms in order to prevent a disorderly liquidation of the large hedge fund Long-Term Capital management (LTCM). An important part of what bank supervisors and central banks can do in a crisis is to arrange a rescue of the weak by the relatively strong.

This strategy works in situations where the strong are strong enough to absorb the weak. It is unlikely to work if a whole class of institutions is weak and the entire system fragile.

Putting all this together, the emergency financial powers of the United States on the eve of the crisis were designed for a bank-dominated financial system, not for the complex financial system we had in 2007. The tools were more designed to address liquidity problems, rather than problems of inadequate capital. The powers available to manage the failure of a large institution were limited to banks and did not exist for the rest of the financial system. Overall, the system was better positioned to deal with an idiosyncratic shock than a systemic financial crisis. It had worked reasonably well for the crisis of the previous several decades, but was not up to the challenge of confronting a classic financial panic.

It's also worth noting that the U.S. emergency arsenal was, in important respects, weaker than that available to the authorities in the other major economies. This relative weakness was partly a function of the fact that most other major financial systems were dominated by universal banks, while our system limited the activities of banks and divided financial activities among banks and non-banks. This meant the defenses of prudential regulation and the safety net applied more broadly in most other economies than in the United States. In addition, most other central banks had broader standing authority to intervene in a financial crisis, not just because of the broader reach of their traditional lending facilities, but also because many had the authority to purchase a much broader range of financial assets than did the Federal Reserve. This would prove extremely valuable in helping prevent a more damaging collapse in asset values and in funding markets. Finally, parliamentary systems of government typically had more ability to legislate additional emergency authority in the crisis than did the United States system, with its greater separation between executive and legislative branches and the periodic reality that the party of the President might not control either house of Congress. In the United States, the President's authority to deal with a systemic financial crisis, without action by Congress, was essentially limited to closing the equity markets and declaring a bank holiday.

4. The U.S. Response in the Early Phases of the Crisis

By February of 2008, the stability of the financial system was eroding. The Fed had cut interest rates aggressively. However, monetary policy alone could not address weakness in the financial system, and the weakness in the financial system limited the effectiveness of monetary policy in offsetting the slowing economy. On February 13, Congress enacted the *Economic Stimulus Act,* which included a $45 billion package of tax cuts for businesses to help offset the contraction in private demand. The stimulus provided an early if modest support for the weakening economy.

In addition to the interest rate cuts, the Federal Reserve had taken several actions to provide funding to banks through the discount window, reducing the interest rate at which banks could borrow, lengthening the terms they could borrow, and encouraging borrowing by trying to reduce the stigma of coming to the Fed window. These programs were valuable, but they were most actively used by foreign banks. Most U.S. banks were not, at that point, experiencing material funding pressure, and were not eager to risk being thought of as weak because they borrowed from the Fed. The availability of funding for the Fed on more favorable terms was not effective in encouraging banks to lend more to the rest of the financial system. Even at that relatively early point in the crisis, banks were husbanding their capital and reluctant to lend to the weaker parts of the financial system in the United States.

The funding markets, though still working, were showing signs of strain. The pressures which had started on the periphery of the financial system, were starting to move closer to the center of the system.

Several of the major U.S. banks and investment banks and the large foreign banks had raised capital in the fourth quarter of 2007. This was valuable but not enough. The price of securities most exposed to the rising mortgage defaults and to the broader risks of an intensifying recession continued to deteriorate. Assets that were rated AAA and whose prices had never declined more than a few basis points were down by a five, then 10 percent and even further.

The weakest parts of the financial system had been trying to reduce their exposure to the types of assets perceived to be at most risk, and the market was less willing to fund those assets, and less willing to provide funding to the weaker institutions. There were more troubling signs of fire sales, fears of additional forced selling, and increases in margin and haircuts. This dynamic, always dangerous, was feeding on itself. Fear was contagious.

Up to this point, the Federal Reserve had used what you might call the conventional arsenal of tools. The first test of the emergency authorities, the less conventional tools, came in late February and early March of 2008. In those weeks, it became harder and harder for *non-bank* financial firms to fund their portfolios of assets apart from Treasuries, and the market began to pull back from the weakest of the independent investment banks, Bear Stearns.

We didn't know how bad it might get. We couldn't foresee how the ongoing "run" might evolve, and how rapidly and broadly it might spread. We had only limited knowledge about the potential severity of losses and which parts of the financial system were most exposed to losses, because of the limited reach of our supervisory authorities and the fundamental uncertainty that complicated any assessment of the likely depth of the recession and the incidence of losses.

We did, however, come to adopt what you might call a general framework for thinking about what should be done and how to balance the many competing objectives that had to inform strategy in a crisis. I am going to describe this framework, at least as I understood it, recognizing that my colleagues at the New York Fed, the Federal Reserve Board, and the Treasury might describe it differently and express it better.

This framework didn't provide a perfectly clear guide to navigate the challenges ahead. It had to evolve over time. And, of course, we had to translate this framework into concrete things that were feasible with the authority we had and the tools we could invent. No plan survives first contact with a crisis. Ultimately, our actions were determined by what was feasible in the moment.

5. A Framework for Escalation

Our objective was to achieve a soft landing for the economy, not to try to sustain the unsustainable. After a substantial increase in borrowing relative to income, a substantial rise in housing and other asset prices, and a dangerous increase in risk in the financial system, asset prices had to fall back to earth. There would be considerable financial losses and the failure of many financial institutions. The Fed could not and should not try to prevent that adjustment from happening, but we had to try to limit the risk it went too far and caused too much damage to the economy.

We were constantly weighing two different types of risk. On the one hand, we were concerned about the risk of doing too much, too soon. To escalate too early and to try to prevent a necessary adjustment would risk one type of problem: trying to sustain the unsustainable might add to moral hazard risks and impose long term costs on the economy.

But we were always concerned about the other risk: the risk of falling too far behind the curve. If we were too tentative or too slow, the run on the financial system might get too much force and be harder to manage.

***The Generally Available Funding Programs*.**

In deciding how to escalate—how fast and how far to extend the scope of the funding, and how much risk to take—our focus was on how to preserve the functioning of those parts of the financial system that were the most critical to the economy. We believed the appropriate role of the central bank was to keep the core of the financial system liquid, to try to limit the risk of a broad fire sale of assets and a substantial overshooting of asset prices.

We used the Fed's emergency lender of last resort tools to provide a funding backstop to the parts of the financial system that operated alongside the banking system. Although we couldn't use the funding tools to replicate the protections of a guarantee against losses, we tried to replicate the example from the classic bank runs of the past when banks had placed gold or silver in the window to reassure depositors that they didn't need to rush to take their money out. If financial institutions like investment banks knew they could borrow from the Fed to replace a loss of funding from the market then they would be less likely to sell assets into the panicky markets. If the creditors of those institutions knew they had access to the Fed backstop, then the creditors would be less likely to reduce their exposure to those institutions.

The typical crisis starts slowly but can accelerate dramatically. You need to try to be preemptive. If you establish the backstop after the run has too much momentum, then it will not be effective. The condition in Section 13(3) requiring that the borrower be "unable to secure adequate credit accommodations from other banking institutions" made it hard to act as early as might have been ideal. In a sense, the statute required that we wait until there was an acute loss of funding before lending. We interpreted this to allow us to activate a new emergency facility if there was a dangerous erosion in funding conditions that created the possibility of a complete loss of access to liquidity.

As conditions deteriorated and the risk of collapse in markets spread, we deployed a progressively broader backstop with progressively greater force. In most cases, but not all, we deployed the new facilities before a particular funding market was shut down or a critical class of institutions completely lost funding.

Given the structure of the U.S. financial system, constructing a credible funding backstop required support for different types of financial *institutions*, like banks, investment banks and the government-sponsored enterprises (GSEs), and it required programs that supported different types of *funding markets*, like commercial paper and asset back securities. These two types of programs were what you might call *generally available* programs, i.e. available on similar terms for certain classes of firms and financial instruments.

The programs for *institutions* were made available to *banks*, which among other critical functions, provide the foundations of the payments system; to the *primary dealers*, which in March of 2008 were a group of 20 of the major banks and investment banks through which the Fed executed monetary policy and the U.S. Treasury funded the government; and to the *government sponsored mortgage entities*, Fannie Mae and Freddie Mac, which were critical to the housing finance system.

The programs for *funding markets* were directed at preserving the functioning of the mortgage markets, commercial paper market, and the asset backed commercial paper market. (In addition to these programs which used only the Fed's lending authority, we subsequently used a combination of the Fed and the Treasury's emergency authority to revive the asset backed securities markets, markets that were a source of funding for a range of consumer finance products from credit cards to auto loans).

The arc of escalation went roughly like this: We started with banks and then expanded our lending programs to include the primary dealers, then moved to the GSEs, and then when other critical parts of the system were at risk of failure, we moved to backstop the key funding markets.

Apart from the expanding scope of these programs, over time we also gradually increased the amount of risk we assumed, by extending the maturity of the loans (as in the case of the discount window and the Term Auction Facility (TAF), and expanding the range of collateral we lent against (as in the case of the emergency lending facility for the investment banks and securities affiliates of the major banks). The terms of the funding, in terms of the price and the haircuts, were designed to be attractive enough to be valuable in the crisis but expensive when conditions normalized so as to avoid prolonged use.

This distinction between programs directed at *institutions* and *markets,* is somewhat artificial. The programs for the different *funding markets* obviously also provided critical support for the core *institutions* and helped improve their viability.

These programs eventually covered much of the financial system, but they were not comprehensive. We had to decide, as will our successors in future crises, how to define the boundaries of these programs. How narrow or broad should be their reach?

Our approach was to extend them to support only the most critical functions of the system, not every part of the financial system. We started with banks then moved to primary dealers, which were a defined class of institutions that were essential to the execution of monetary policy and the funding of the U.S. government and performed much of the capital-raising and market-making activities of the U.S. financial system. We did not establish broader funding programs for insurance companies or for other types of *non-bank* or specialty finance companies because we believed they were less critical to the stability of the financial system. We extended these programs to the broader funding markets when those markets stopped working well.

The Fed's generally available lender of last resort funding programs, although essential, were limited in what they could do. We didn't fully appreciate the limits of their power until we got deeper into the crisis. But we knew enough to realize that, even when used creatively, they would leave a substantial amount of risk with the private markets, including equity investors in, and creditors to, financial institutions. They could mitigate a loss of funding, but they could not make up for a lack of adequate capital, and they did not have the force of a guarantee. They could help keep a viable firm liquid and functioning, but they had limited power in sustaining the weakest parts of the financial system. Ultimately it took a much broader mix of guarantees and capital injections—together with a powerful set of monetary policy action and fiscal stimulus—to prevent the collapse of the financial system.

At this initial phase of the crisis, we were not operating in a system where the executive branch had authority delegated by Congress to inject capital, provide broad guarantees, or nationalize parts of the system. How did we decide the boundaries that defined what the Federal Reserve should do and could not do? There were no neat and clear lines, and this was contentious within the Fed. Many within the Fed argued that we should limit our actions to those necessary to protect the banking system and leave the rest of the challenges to the Congress and the Treasury. Some believe that in acting beyond those conventional limits we would risk damaging the Fed's credibility, add to future moral hazard risk, or make it easier for Congress and the Executive Branch to delay. We shared those concerns, but Chairman Bernanke, his colleagues, and I decided it was important to use the authority we had, with increasingly novel and expansive interpretation of that authority. We believed we had the responsibility to act to try to keep the financial system liquid, even though that might mask the severity of the problem and for a time make it harder for the broader U.S. political system to recognize the need for additional action.

6. Interventions for Specific Financial Institutions

In addition to these broad funding programs for different classes of institution and funding markets, the Federal Reserve used its emergency authorities to provide additional support to individual institutions where we believed the failure of that institution would jeopardize the stability of the broader financial institution.

We considered this in two different contexts, first for the major investment banks, second for AIG, and then for the auto finance companies.[9] In deciding whether to use our emergency authority to help prevent the failure of an individual institution, we considered several different questions.

Was the failure of the institution likely to be materially damaging to the stability of the core of the financial system and the overall economy?

This assessment was a function of the firm's size, the importance of its role in the funding and credit markets, its linkages with the rest of the financial system, and the contagion that might accompany its failure. The risk to the financial system was in turn a function of the state of the world at that moment in time. Failure of a large non-bank in a relatively stable world would matter less than the failure of even a more modest sized institution in a very fragile world. In 2008, Bear Stearns, Lehman, Merrill Lynch, and AIG all posed this risk. This of course was also the case for the major U.S. banks.

[9] The Fed also used the 13(3) authority in the context of the later "ring fencing" arrangements for Citi and Bank of America.

In the event of failure that might cause systemic damage, did the Fed have the ability to contain the damage?

Were the protections that could be provided by the broader provision of liquidity to the markets or through our general funding facilities powerful enough to contain the risk of a broader run? If so, then our first instinct was to not intervene to try to prevent the failure of the specific institution.

How weak was the institution?

If you are not required to determine solvency but should not lend to the nonviable, how should you decide? Since any severe funding problem will at least raise plausible doubt about viability, you can't decide that illiquidity itself is disqualifying. That would render the lender of last resort meaningless. It would be like saying the Fed could lend only to those who don't need it. To judge viability, you have to rely on other things that you can observe and evaluate, such as the relative degree of concern about the institution's default risk and its equity value in comparison to similar institutions. In Lehman's case, we had the evidence of the prolonged inability of Lehman to raise capital, to sell assets, to fund its real estate portfolio at values anywhere close to where it was carrying those assets, and the limited value other institutions attached to its various investment banking businesses.

Would a loan against the full amount of available collateral prevent default?

The emergency provisions of the Federal Reserve Act, by limiting the amount the Fed could lend to the value of the available security, were designed to limit the amount of risk the Fed could take and therefore limit the ability of the Fed to rescue institutions closer to the point of insolvency. If the assets and businesses of the institution had enough value to support a loan large enough to prevent failure, then the Fed could act on its own to prevent that failure. This was the case with AIG. In contrast, if the value of the assets held by the firm were not sufficient to support a loan large enough to allow it to continue to operate, then the Fed did not have the ability to act on its own to prevent that failure. In that later case, which was the case for the independent investment banks, the Fed could use its lending powers to help support the acquisition of a failing firm by another financial institution, as we did with Bear Stearns, but in the absence of a willing acquirer or another source of equity capital, the Fed's emergency authority alone could not prevent failure.[10]

[10] What determined the amount of support we could provide to help facilitate an acquisition? As we demonstrated in the case of the JPMorgan acquisition of Bear Stearns, we could lend against a portfolio of securities provided the we believed there was a reasonable chance that those assets would ultimately be worth enough to cover the value of the loan. Since we had a lower cost of funds and could hold the assets over time, through the recession, we could effectively value the assets at a higher level than might be possible by the acquiring institution or that the market as a whole might place on those assets during the crisis. This provided a potentially valuable incentive in facilitating a merger, but that value was limited by the constraint on the amount of risk we could take. If the gap between the value of the assets as marked on the books of the failing institution and the value the market ascribed to those assets was large, as in the case of Lehman, then we were unlikely to be able to close all of that gap.

How did we apply this broad framework in the case of the investment banks and AIG?

With no resolution authority, and no ability to provide capital or guarantee liabilities for financial institutions that were not banks, the only tool we had available to prevent the failure of a major non-bank financial institution, until Congress passed the emergency legislation in October 2008, was the Federal Reserve's authority. This authority was designed to reduce the chance that a relatively strong institution would become illiquid, but because the amount the Fed could lend was limited to the amount of collateral available, this authority could not ensure that the weakest could remain viable. The generally available funding facilities, the actions to prevent the failure of the GSEs, and the broader policy actions to limit the severity of the recession could all help to reduce the risk of failure of the major financial institutions, but they could only do so much.

This meant that our ability to prevent the failure of a major *non-bank* depended on the value of its assets and the strength of its underlying businesses. If the assets and the firm's capacity to generate income were sufficient to support a loan that was large enough to prevent failure, then the Fed's authority could be used to prevent failure. Where those conditions did not apply, then our options were limited to trying to facilitate an acquisition of the failing firm by a stronger institution. We could facilitate an acquisition by lending against a portion of the assets of the failing firm, as we did in the Bear Stearns' case and could potentially have done in the Lehman case, but we could not guarantee the obligations of the failing institution or inject capital. The presence of a viable buyer depended on the relative strength of the potential acquirers, the relative attractiveness of the businesses of the failing institutions, and a rough estimate of the value of its assets. If the failing institution was large, then by definition the universe of potential acquirers was limited, and this list narrowed as awareness of the potential severity of the crisis and the recession intensified. The weaker the failing institution, the less likely there would be a viable buyer.

We viewed Bear Stearns and Lehman though essentially the same framework. Both were too weak to survive on their own. The failure of either, in the fragile conditions of that time, would have threatened the stability of the financial system. Both had a mix of existing assets and businesses that were not considered valuable enough by the markets to enable them on their own to withstand the losses on their balance sheets. Or to put it differently, estimates of potential losses were large enough relative to the equity value of the firms to raise substantial doubt in the market about the ability of both firms to survive as independent entities and to cover their obligations.

In the case of Bear Stearns, when, together with the Treasury, we undertook the first real-time exploration of our options to prevent the failure of an independent investment bank, we decided that Bear was too weak for us to be able to lend them enough money to survive. We made this judgment on the basis of what we could observe in the market, what we learned about Bear's businesses and assets on Thursday night and into the weekend as we were able to examine its books, and by the reactions of the potential acquirers that weekend as they considered providing capital to or acquiring the firm.

All this confirmed our belief that the firm did not have assets of enough value to "secure to [our] satisfaction" a loan large enough to enable it to survive on its own. Although we agreed to a short term loan to get them to the weekend, we thought to lend into the run would simply finance the exit of Bear's existing creditors, while the businesses eroded, along with the ultimate value of the firm.

When we decided we did not have the ability on our own to prevent Bear from failing, we were left with two options: (1) to help facilitate the acquisition of Bear by another financial institution; and (2) to put in place funding facility to help backstop the remaining four independent investment banks. We chose to do both.

When JPMorgan first proposed that the Federal Reserve assume some of the risk in preventing Bear's failure, our initial response, given the exceptional nature of such a step and the risks involved, was to propose that the Treasury provide a guarantee against any losses the Fed might face. Secretary Paulson, after consulting the Treasury General Counsel, determined the Treasury had no authority to provide such a guarantee.

While we were engaged in this discussion about Treasury's authority, we took a closer look at the $30 billion portfolio of Bear's assets which JPMorgan was proposing to leave with us. Our assessment was that, although there was a chance that in a severe crisis we could lose money, it seemed likely that we could earn a positive return if we held the portfolio through the recession. The expected value of the portfolio was slightly positive, allowing us to believe we could meet the condition in the Federal Reserve Act that we could be "secured to our satisfaction." We could have been wrong in either direction. The fact that two-thirds of the portfolio was composed of securities backed by Fannie and Freddie was important to this judgment, though of course it would ultimately require substantial government resources to ensure that Fannie and Freddie could meet their obligations.

This portfolio entailed a modest amount of risk to the Fed. Despite the limited risk to us, this was valuable to JPMorgan because the capital charge associated with holding those assets would have absorbed some of the cushion remaining on both its risk weighted and total capital ratios. This was important because the roughly one-third of the portfolio that was considered relatively low risk to us—the securities whose underlying risk was backed by Fannie and Freddie—would still have counted against JPMorgan's total (non-risk weighted) capital ratio.

We asked Secretary Paulson to write us a letter conveying his view that acting to help prevent the failure of Bear was important to the stability of the financial system and recognizing that any loss born by the Federal Reserve would ultimately be borne by the U.S. taxpayer. In effect, we established the expectation that if the Fed were to undertake a similar action in a future case we would ask for a similar statement of support from the Treasury Secretary.

The events of that weekend in March 2008 had an important impact on how we approached the events of September.

There had been very few interested buyers for Bear, in part because of concerns about the weakness of Bear's businesses, in part because of the very short time frame in which they had to act, in part because of its size (even though it was the smallest of the independent investment banks), and in part because the universe of firms strong enough to be viable buyers were worried about taking on more risk as the crisis intensified.

In the weeks following the merger announcement, despite the fact that JPMorgan agreed to stand behind all of Bear's remaining obligations, Bear continued to lose funding and business in part because of uncertainty about whether the merger would be approved by Bear's shareholders. And, despite our decision to help prevent Bear's failure and to lend directly to the remaining independent investment banks, funding conditions for the major investment banks, particularly Lehman, continued to erode in the weeks and months that followed.

In invoking the Fed's emergency authorities that March, we crossed a line that had not been crossed since the Great Depression. We had discussed the risk that our actions that weekend in March might provide false comfort to the management of and the creditors to the remaining investment banks. To create the impression of support without the capacity to provide that support was a consequential step.[11] We decided that the benefits of acting to try to contain the growing crisis justified that risk. And we spent the weeks and months that followed in a concerted effort to reduce the odds of a more severe crisis. These actions included: a joint effort by the FRBNY and the SEC to force the major investment banks to reduce their vulnerability to further erosions in market funding; a sustained though unsuccessful effort together with Secretary Paulson to get Lehman to raise additional capital or merge with a stronger institution; Secretary Paulson's successful efforts to convince Congress to pass legislation to intervene to, in effect, guarantee the viability of Fannie and Freddie; continuing effort by the Fed to place the tri-party repo and derivatives markets on a more stable footing; and effort by Treasury and Fed staff to draft a framework for additional emergency legislation that would provide authority to inject capital into individual financial institutions, purchase assets, and "resolve" large failing investment banks and other financial institutions.

Bernanke, Paulson, and I had decided in March that the system was too fragile to contain the potential fallout from default by a relatively small investment bank. The rest of the financial system remained very fragile. Congress provided the authority to prevent the failure of Fannie and Freddie, but was not prepared to act on additional authority over the course of the summer.[12] As a result, even as the probability of failures of other large non-bank financial institutions increased over the course of the summer, our limited tools for preventing them had not changed.

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[11] Bagehot had warned about such a risk in writing, "To lend a great deal, and yet not give the public confidence that you will lend sufficiently and effectually, is the worst of all policies…." Thanks to David Wessel for this quotation and for reminding me of the richness of Bagehot's various admonitions. (See Bagehot 1873).

[12] While deliberating the early drafts of TARP legislation, Barney Frank said to Hank Paulson "We want to adopt something that works, but there is resistance within our caucuses." (Paulson 2010).

Lehman was similar to Bear in the challenges it presented us but different in several respects. It was larger. It was widely perceived to have a substantially greater magnitude of losses. Because of its size, the perceived attractiveness of its various businesses relative to its competitors, and its risks, Lehman, even in a more stable world, would have had a smaller universe of potential buyers. That universe was even smaller given the fact that the risks of a deep recession and a more severe crisis were much greater in early September than they had been in March.

Lehman's position was perilous in part because of the approach it had adopted over the course of the summer. In trying to raise capital, it had opened its books to a broad universe of potential investors and partners. This process of selective disclosure did not increase confidence. And Lehman's decision to raise a relatively small amount of capital and not from a strategic investor with a stronger balance sheet left it very vulnerable.

Going into the weekend of September 13, we hoped we could help facilitate a merger, like we had with Bear and JPMorgan[13], or convince a consortium of the world's major financial institutions to either help prevent a disorderly failure as Bill McDonough had ten years earlier with LTCM, or to assume some of the risk in facilitating a merger. There was no support for the LTCM option, but we told the two potential acquirers of Lehman that we were willing to help make it possible for them to leave some of Lehman's assets behind. And we made the case to the major banks that it was in their best interest to fund a special purpose vehicle that would take the unwanted assets. We considered this as a potential substitute for what we had done with JPMorgan in the Bear acquisition, or as a supplementary source of financing from the Fed for any deal that could be negotiated.

The events over that weekend gave us a range of additional insight into the potential size of the losses in Lehman's assets and the potential value of its various businesses. The market had long suspected that Lehman had been overvaluing its assets and, beginning in the spring of 2008, certain investors had begun to go public with their concerns.[14]

Our initial impression, reinforced over the course of the weekend, was that the economic risk in Lehman's pool of assets was substantially larger than the Bear portfolio, and that the financial institutions that were most likely to find value in Lehman's businesses did not believe that those businesses had sufficient value relative to the significant risks.

The largest and most contested valuations involved Lehman's real estate holdings. Following its failure over the summer to secure a buyer or provider of capital, Lehman announced on September 10 a plan to spin off $30 billion of its most risky assets into a separate company, nicknamed "SpinCo," leaving the "clean Lehman" to be recapitalized. The market was not willing to acquire these assets at anything close to what Lehman was hoping to receive. It

[13] See BusinessWire (2008) for the press release announcing the details of the JPMorgan Chase Bear Stearns merger.

[14] The actions in early September, to put the GSE's into conservatorship and other announcements by the firm, were followed by a new wave of pressure on Lehman, as investors became more concerned about the scale of potential real estate losses ahead and the vulnerability of other firms to those losses. (See FCIC 2011).

could not sell them at the market price without taking losses that would have been fatal given the erosion in its equity value. Lehman’s stock fell further, bringing it closer to the edge of the abyss by the end of that week. (Smith 2008).

Over the course of the weekend, Lehman’s potential suitors cast further doubt about the value of Lehman’s assets. BoA’s rough estimate, based on data from Lehman itself, was that Lehman had $60-$70 billion of assets marked well above what they were likely to be worth. This was surely an opening bid in a negotiation, but it also provided a measure of the extent of Lehman's losses and the relative weaknesses of its businesses.

Barclays was interested, too, but it made it clear from the beginning that it would not consider acquiring Lehman unless it could leave behind a large pool of assets that Lehman had valued at roughly $50 billion. (Paulson 2010) (Sorkin 2009) (Wessel 2009).

Alongside these discussions with potential buyers, we tasked a group of other bankers with the job of valuing the firm’s assets. On Saturday, the group estimated that Lehman had overvalued its $58 billion in real estate assets by close to fifty percent and that its private equity valuations were also highly questionable. (FRBNY 2008). Those banks might also have had an interest in overestimating those losses since they were aware we might ask them to assume some or all of that risk. But, in any event, all agreed that overvaluations by Lehman—and associated potential losses—were substantial.

By Saturday afternoon, BoA had decided Lehman’s capital hole was too deep and that it was more fragile and less valuable than Merrill. In contrast to Lehman, which BoA said it would not consider buying without being able to leave behind those $60 billion of the riskiest assets, BoA agreed to pay $50 billion to acquire all of Merrill’s assets and liabilities without the Fed assuming any of the risk.

Barclays was then left as the only potential buyer for Lehman, but on the condition that it could leave behind a substantial pool of the riskiest assets, which the private consortium had tentatively agreed to fund. When the British regulators refused to waive a London Stock Exchange requirement that Barclay’s shareholders approve an open-ended guarantee of Lehman’s trading book during the pre-closing period, which would have entailed a dangerous 30-60 days of uncertainty, Barclay’s asked whether the Fed would provide a full guarantee of Lehman’s trading book.

We considered whether we could do so, but our lawyers determined that the Fed had no legal ability to provide such a guarantee.[15] Although the British authorities did not say it explicitly to us at the time, they made it clear in accounts written after the crisis that, at the

[15] Although in this instance, the financing had been secured by the private consortium’s agreement to fund Lehman’s real estate assets, the guarantee was still critical to forestall a run between signing and closing. Barclay’s could not guarantee Lehman’s trading book without a shareholder vote and the Fed had no authority to issue an open-ended and unsecured guarantee. See Baxter (2010a) regarding the importance of a third-party guarantee of Lehman’s operations and the likely negative prognosis for the company without one.

time, they deemed Lehman too close to insolvency to risk burdening an already weak Barclays. They interpreted our indications that we could not provide a guarantee as further indication that Lehman was too weak. They did not want to import the "American cancer." (Paulson 2010).

With Barclays out of the picture, and no other interested buyer on the horizon, we were out of options to prevent Lehman's failure.[16] Just as we had concluded with Bear, our judgment regarding Lehman was that the combination of the fragility of its businesses and the scale of losses in its assets meant that we could not provide them a loan large enough to save them. To lend on that scale, we believed, would not have been effective and would have been outside any reasonable interpretation of the scope of our emergency authority.[17]

As in the case of Bear, we believed that lending into the ongoing run would just finance the exit of other creditors, fail to arrest the collapse in confidence in the institution, and erode the ultimate value left for the rest of the creditors, all without improving the odds that a viable buyer would emerge. The company's unsuccessful efforts over the previous six months to attract a suitor or raise sufficient capital, the market's perception of the extent of the financial weakness of Lehman,[18] combined with the intensity of the pressures on the rest of the financial system, meant to us that a strategy of lending to buy time would not work. Because we could not inject capital into the firm or guarantee its liabilities and had no ability to run the type of "resolution" or quasi bankruptcy process the FDIC had the authority to use for banks, we were out of options to prevent Lehman's failure.[19]

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[16] We coordinated with the SEC to devise a "Plan B" in this event. The plan was to have the broker-dealer, their main U.S. operating entity, continue to operate with funding from the Fed to wind down its book, since, at a smaller size, a SIPC proceeding would be more orderly. And this is essentially what happened with the SIPC proceeding commencing on September 19, helped along by Barclay's acquisition of most of the firm's assets.

[17] As noted above, although we did not believe we had the legal ability to save all of Lehman on our own, we did have the ability to lend against the collateral they held in their U.S. broker-dealer which had not been included the parent's bankruptcy filing. We did lend to the broker-dealer on a substantial scale after the holding company filed for bankruptcy to help reduce the risk of a larger, immediate liquidation.

[18] Even ten years after its bankruptcy there is no consensus regarding Lehman's solvency or the size of its capital hole. Anton Valukas, the court-appointed bankruptcy examiner determined after extensive analysis and assistance from advisors, that "[u]tilizing a market-based approach" there was "sufficient evidence to support a finding of insolvency of LBHI [the parent company] beginning on September 8, 2008," and perhaps as early as September 2nd (Valukas 2010, 1973). Duff and Phelps who looked at Lehman's assets for the bankruptcy examiner, determined on an implied asset value basis that Lehman was insolvent on various days during the summer 2008 and valued its net worth at approximately -$35 billion immediately before its bankruptcy filing (Valukas 2010, 1578-80). Also see Ibid. Appendix No. 21: LBHI Insolvency Analysis for more detail). The FDIC, in considering the hypothetical application of its new orderly resolution process for non-bank institutions calculated it as -$5 billion. (FDIC 2011). The estimates of others have also varied widely. Even Ball (2016), who has vigorously criticized our actions (or inaction) calculated Lehman's net worth between -$2 billion and $13 billion (assuming its subordinated debt would not be wiped out). Notably, Cline and Gagnon (2013) reached the largest estimate at -$100 billion to -$200 billion.

[19] In responding to the Financial Crisis Inquiry Commission, Chairman Bernanke expounded on our reasoning—"the credit relied on by Lehman to remain in operation was in the hundreds of billions of dollars and the lack

Even if we could not prevent failure, the law gave us the ability to lend to an institution or an affiliate of an institution that might be on the edge of failure to allow time for a more orderly liquidation, but only to the extent we had security sufficient to cover the value of our loan.[20] We were able to act to help prevent a precipitous liquidation of the broker-dealer because Lehman's U.S. broker-dealer affiliate was much smaller than the firm as a whole, its liquidity needs were smaller, and we concluded that the value of the collateral held in that entity was sufficient to cover its immediate funding needs. The funding that we provided to the broker-dealer under the Primary Dealer Credit Facility (PDCF) and other facilities after Lehman's bankruptcy filing meant that this smaller entity could continue to close out its trades for a few more days, shrinking the firm and moving towards a more orderly liquidation.[21]

Some have contended that Lehman was nominally solvent and therefore we could have lent it enough money for it to survive. As discussed earlier, the absence of an explicit solvency test in the Federal Reserve Act does not mean that the lending tools should or could be used to sustain firms that are not viable. To lend freely to the nonviable carries many risks. Moreover, a simple crude "solvency" test by itself, even if such tests were feasible during a panic, is not an adequate basis for a decision to lend.

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of confidence that led counterparties to pull away from Lehman suggested that Lehman would need a credit backstop of all its obligations in order to prevent a debilitating run by its counterparties. Moreover, the value of a substantial portion of assets held by Lehman, especially its investments in RMBS, loans, and real estate, was falling significantly. Derivative positions were subject to continuing collateral calls that required amounts of Lehman funding that could not easily be quantified in advance. And clearing parties were demanding collateral as a condition for serving as an intermediary in transactions with Lehman. We saw no evidence that Lehman had sufficient collateral to support these types and amounts of taxpayer support from the Federal Reserve [...] Moreover, without a potential buyer for Lehman, the Federal Reserve could not be certain how long it would be required to fund Lehman or what the ultimate source of repayment, if any, would have been." (Bernanke 2010).

Baxter (2010a) asserts the importance of a third-party guarantee of Lehman's operations and the likely negative prognosis for the company without one.

[20] Baxter improves on this formulation, explaining that "to be secured to our satisfaction" traditionally required that we have a "first priority perfected security interest in eligible collateral with a lendable value [after a haircut] which exceeds the amount of the credit extended"–to provide some margin of safety that would be greater than or equal to the amount lent. (Anand 2016).

[21] Lehman's broker-dealer borrowed under the PDCF but was subject to two additional terms that took into consideration its unique situation that its parent would be in bankruptcy-(i) steeper haircuts and (ii) the need to certify that assets pledged to the PDCF by LBI on September 15th had been owned by it on September 12th and not transferred to it by the parent after that date. (Baxter 2010b). We did not "cut off" the Lehman parent from borrowing from the PDFC, as some critics have stated. The holding company was never eligible to borrow from the facility, nor was any other parent of a primary dealer. (Ibid.). The broker-dealer borrowed between $40 and $60 billion a day, across 3 different facilities: the Term Securities Lending Facility (TSLF), the PDCF, and the Open Market Operations from September 15 through September 18, 2008. (A repo is functionally a secured loan). (Ibid., Valukas 2010, 1536).

Even using a generous view of the value of Lehman's assets, the losses were in the range of tens of billions of dollars.

Of the firm's roughly $600 billion in liabilities, only about a fifth was long-term subordinated debt, and thus not runnable. Absent a legal resolution or bankruptcy regime, we could not magically turn that long-term debt into equity to absorb the losses. The rest of the liabilities might bleed away, some quickly, some slowly.

If we had been willing to commit to lend hundreds of billions of dollars to cover all the liabilities, or even "just" the $500 billion that were not long-term subordinated debt, would that have that been effective in making the firm viable? That seems extremely unlikely.

If the Fed had assumed all the risk in lending to Lehman, and we had to replace the holders of $500 billion of runnable debt, would we have been able to capture the remaining value in Lehman's assets and businesses ahead of the other claimants to those assets, and would that value be sufficient to cover our exposure? In the extreme case, the Fed would be the holder of assets previously valued at $600 billion but now worth substantially less, having paid out the $500 billion of Lehman's other obligations and with the core business of the bank deeply damaged. That would then become a liquidation exercise, with uncertain remaining assets to back our claims and the claims of the $100 billion of long-term debt holders. Of course, in reality, many of Lehman's assets were already encumbered, and there was no reliable way to estimate the value of the rest.

We were willing to take substantial risk, as we decided to do roughly a day and a half later in the loan to AIG. In the case of AIG, however, we believed there was a reasonable chance that AIG's assets in the form of its insurance businesses around the world were stable enough and valuable enough to support a loan large enough to prevent default. Even in that case, however, the Fed had to increase the total size of its commitment and Treasury had to inject capital bringing the total commitment by the government to $185 billion before things stabilized. Ultimately, the underlying businesses proved quite resilient and profitable, and the tax-payer earned a profit of $23 billion on that package of assistance.

In the Lehman case, without a willing buyer and without access to a resolution regime like the FDIC's regime for banks, we believed that to lend on a scale necessary to save it would be outside the limits of what we could do. The limits on the amount we could lend rendered the tool inadequate to the challenge of preventing the failure of an investment bank in the process of a run. To lend in that context would have been a proverbial bridge to nowhere.

Would a loan to buy time have been helpful in limiting the damage, even if it simply delayed rather than prevented failure?

Perhaps, but I think this is unlikely. We saw in the Bear case how funding continued to bleed away and Bear's businesses continued to erode, even after JPMorgan announced the commitment to acquire Bear. That changed only with a fully credible guarantee from JPMorgan, but at that point a lot of damage had been done. To lend ineffectively, without stabilizing the firm and without credibility preventing failure, would not have been reassuring to a market at the edge of panic.

Of course the central bank should be prepared to take losses. In fact, it is highly likely given all the risk and uncertainty in panics that the appropriate use of the lender of last resort authority might well result in some losses. The greater the risk of contagion from default, the more risk a central bank should be prepared to take. But that is not an argument for lending freely to the nonviable, even in a panic.

Some suggest that if we had been willing to commit earlier to lend against a large pool of Lehman's riskiest assets that we would have encouraged more firms to come forward as potential buyers of the rest of the firm. This is possible, but not likely, given the magnitude of the risky assets Lehman held, the limits on what the Fed could lend against, and the general weakness of the universe of Lehman's potential acquirers. The fact that no other willing buyer came forward in the summer or that weekend with a credible ability to absorb Lehman, even with the prospect of an arrangement like JPMorgan's with Bear, illustrated the limits of what was possible.

Is it possible that if we had lent to investment banks earlier and more generously starting in the summer of 2007, that we could have diffused the risk of the panic before it spread far and wide?

For this to have been sufficient you would have to believe that the weakest of the investment banks were still viable, solvent but illiquid, and simply victims of broader forces beyond their control. There is little basis for believing this. In early 2008, Lehman and Bear reported total assets of roughly 33 times their common equity.[22] Both firms had funded those assets with short-term obligations, the type of funding most likely to run when things got scary, which is exactly what happened. They ran businesses that seemed viable and profitable in a boom, when liquidity was cheap and available, but were not designed to withstand a less benign environment. They were too late to recognize this reality and to adjust course.

Confidence in Lehman eroded dramatically in the weeks after Bear's near failure in March 2008, even though we had established the PDCF to provide backup liquidity to the investment banks in the event that they experienced a situation similar to Bear.[23] In September, confidence eroded in Goldman and Morgan Stanley, even after we expanded the terms of that facility on the Sunday night of Lehman's failure to accept any type of security that could have been used in the tri-party repo market, including collateral located overseas, thus providing a fuller backstop for funding that ran from any part of the firms.

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[22] See Lehman Brothers' SEC Form 10-Q for the period ending June 30, 2008 (Lehman Brothers 2008) and Bear Stearns' report for the same period. (Bear Stearns 2008).

[23] We had also established the TSLF which accepted securities that could no longer be used as collateral in the repo market and exchanged then for Treasuries which the firm could still borrow against. (Board of Governors of the Federal Reserve Website).

A variant of this argument—that if we had deployed our existing authorities sooner and more aggressively, things would have been different—is that if we had agreed to allow all investment banks to convert to bank holding companies earlier, they would have been able to benefit from the halo effect of Fed support and would have survived. We can't fully know the answer to this, but the balance of evidence doesn't support that judgment.

Lehman had asked late in the summer whether we would consider making them a bank holding company on the theory that it would give the impression of greater access to funding from the Fed. Given the erosion in Lehman's financial position, we did not think that would be effective, in part because it wouldn't in practice materially change the degree of funding from the Fed, and to create the perception of protection without the reality would be ineffective.

After Lehman's failure, the Fed did agree to make Morgan Stanley and Goldman Sachs bank holding companies on September 21, but only on the condition that they raise a substantial amount of outside capital from private sources. They were able to do this, but even with that additional equity capital, and even after giving the market the impression that Morgan and Goldman were more securely under the Fed's protection, both banks remained perilously close to failure until, using the newly granted authority of the Emergency Economic Stabilization Act, Treasury injected capital into them, and they were able to issue new debt with a full FDIC guarantee. (Dealbook 2008). (Geithner 2014). (Avraham, Selvaggi, and Vickery 2012).

Was Lehman the cause of the broader panic, or was it more the symptom of the broader forces that caused the panic?

Because of Lehman's size and the timing of its failure, many people believe that Lehman was the cause of the panic that followed. Although the initial market reaction to Lehman's failure was limited, conditions deteriorated rapidly over the course of the next several days. Lehman's default led to the Reserve Primary Fund's decision to "break the buck" as a result of significant losses in Lehman commercial paper. The Reserve Primary Fund's "breaking the buck" led to a general run on prime money market funds. Money market funds withdrew funding from other investment banks, non-bank financial institutions, and other foreign banks. The actions by the Lehman administrator in London to seize collateral in prime brokerage accounts led to a general flight by hedge funds and other financial firms from other investment banks and broker-dealers. Lehman's failure and AIG's near failure, both coming soon after the actions to put Fannie and Freddie into conservatorship, raised the probability of failure of other financial institutions. The crisis spread later that week to the weakest of the major U.S. banks, WAMU and Wachovia.

We hoped the damage would be less severe, given how much time the markets had to prepare for failure, but we feared it would be terrible. [24] Lehman's bankruptcy obviously

[24] The progressive erosion in Lehman's financial position over the course of the summer was in effect the impact of its counterparties and investors preparing for the possibilities it would not survive. (See FCIC 2011).

made a fragile situation worse, but its failure was more a symptom of the broader breakdown of the financial system than the fundamental cause of that breakdown. The financial system had already been experiencing a slow, less visible run for more than a year. The much larger AIG, Fannie and Freddie, and Merrill Lynch had all arrived at the edge of collapse at roughly the same time as Lehman, not as a result of Lehman's failure.

A common framework people use in trying to understand crises is that of dominoes or contagion. But the agent of causality in a systemic financial crisis is rarely the direct losses caused by a large failure. Ed Lazear's preferred metaphor is of popcorn on a stove or in a microwave. The growing heat, a reflection of the intensifying recession, causes the popcorn to pop, and then more firms to fail.

This is closer to reality than the domino or contagion metaphors of crisis, but it's not quite right. The better explanation is that as the scale of losses, actual and expected, increase, more institutions are pushed closer to the edge of collapse. The market, not able to differentiate fully, pulls back from all that look potentially vulnerable. The failure of one raises the implied probability of the failure of other firms considered similarly exposed to losses from a deepening recession.

When market participants cannot discern the scope of the official safety net, in terms of the types of institutions that fall within it, or they do not understand the limits of that safety net in preventing failure, then the chances are greater that panic escalates with the unexpected failure. In this sense, an important consequence of Lehman's failure was that it changed beliefs about what type of institution the Fed and the government had the power or the intention to save. This mattered at the time, but it was not the most important effect. The crisis intensified after Fannie and Freddie were placed into conservatorship, and it intensified after the Fed announced it would lend to AIG, although both actions prevented default and dramatically limited the losses on the broader financial system. By highlighting the fragility of some of the largest financial institutions in the world, each of which had been rated among the safest of any of the major financial institutions, the fact that the government and the central bank had to intervene to prevent their failure eroded confidence in the rest of the financial system.

7. Lessons from This Phase of the Financial Crisis.

This phase of the crisis from the late winter to the early fall of 2008 offers some important lessons for the design of financial systems and for crisis management.

Perhaps most important, it illustrates the dangers of allowing the prudential safeguards to erode and allowing financial systems to evolve beyond the perimeter of the prudential constraints. In any risk-based capital system, a long period of relative stability will reduce estimates of future losses and erode the protection provided by the capital regime. If you wait too long to remedy this, you will lose the chance to force institutions to raise private capital, and place more of the ultimate burden for the rescue on the taxpayer. If you allow firms to issue deposit-like, "safe" liabilities and to engage in maturity transformation in competition with banks but without being constrained by limitations on leverage and funding, then over time the market share of the more easily defended parts of the system will decline, and the relative size of the rest of the system will expand. In the extreme crisis, the overall financial system will be fragile and harder to stabilize, with greater damage to the economy.

A second painful lesson from this phase of the crisis is the dangers of running a financial system with an outdated and limited arsenal of financial tools.

Lending facilities are an inadequate defense against financial panics. To make it more likely that the financial authorities are able to avoid the savage economic damage of extreme crises, they need to be equipped with the ability to guarantee liabilities, inject capital, and to manage the failure of large institutions through resolution authority, conservatorship, or nationalization. If those tools are not available or require legislation in the moment, then the odds of a more severe crisis are much greater.

The mix of funding, guarantees, and capital that were essential in the last financial crisis will be as important in future financial crises. The absence of any one of these tools cannot practically be compensated for by the presence of the others. The tools of the lender of last resort are not alchemy. Liquidity support alone is a poor substitute for capital. There's no realistic amount of liquidity that can fully reassure creditors in a panic. The typical lending facilities of central banks, lending against collateral with a haircut to market value to provide a margin of protection, cannot provide protection equivalent to an explicit guarantee.

A market where prices reflect fire-sales induced by runs can make in the more conservative capital buffers of today perilously thin. In the absence of an effective mix of monetary policy to lower interest rates and fiscal policy to help offset the risk of collapse in private demand, even substantial amounts of capital and funding protections can be overwhelmed.

The perimeter of the safety net in a crisis has to be broad enough to cover the core of the financial system, even if parts of the financial system lie outside the scope of the formal perimeter of prudential regulations.

And to be effective, a great deal of freedom and discretion in how to use this arsenal of tools is needed, ideally with some independence from the inevitable pressures of politics, given the fog of uncertainty that prevails in a crisis, the speed with which things can shift to panic, and the need for experimentation and adaptation as events develop.

A credible arsenal has to be able to manage the full spectrum of crises, from the idiosyncratic to the systemic. The responses necessary to confront the full continuum of bad things that can happen are very different.

This phase of the crisis also offers some important lessons for crisis management.

No plan survives first contact with the messy uncertainty of a systemic financial crisis. The dynamics of contagion are not predictable. There is no bright line between the insolvent and the merely illiquid, and therefore no purely objective, well-established set of rules for triage among firms. There is no clearly visible threshold between a necessary adjustment in asset values and a few failures of financial firms, and a full-scale financial panic.

We have and we will inevitably in the future experience a wide variety of financial shocks, from the relatively benign to the extreme, from the idiosyncratic to the systemic. They require different solutions. The basic strategy that makes sense in most crises is different from what is necessary in a broader panic. What is conventionally indicated in dealing with banks that are failing for idiosyncratic reasons will, in conditions where the system is fragile, make panics worse. Failures of the weak and losses imposed on creditors, normally a good and necessary thing, can be too much of a good thing when the system itself is subject to failure.

In a fragile financial system, where solvency is in question, the failure of even relatively modestly sized institutions can lead to runs on the relatively strong, because of the difficultly in knowing the severity of losses relative to capital in similar institutions. Default by one will raise estimates of the probability of default by others.

Market expectations of the scope and flexibility of official support play an important part in the dynamics of runs, as do market expectations about the treatment of creditors.

In panics, the core challenge is to reduce the incentive for creditors to run and for financial institutions to withdraw credit from the economy *en masse*. Policy should be directed at that objective, or you risk setting in motion the incendiary forces that can produce economic depressions. It is hard to know in the moment how vulnerable the system is to panic and runs. You may not know it unless/until you are in midst of the run. You have to feel your way, allowing adjustment and failure, weighing and assessing and trying things until you come to the point where you believe the core of the financial system is in jeopardy. This diagnostic challenge is central to the problem of designing strategy in a crisis.

If you have full degrees of freedom in terms of the emergency arsenal of financial tools, and the conditions suggest substantial risk of panic, then you want to err on the side of being aggressive sooner in providing credible protection against the catastrophic risk. That is a function only governments and central banks can provide. To do this requires clear expectations around the extent and limits of the reach of the safety net, recognizing the limits of what the lender of last resort authority alone can do, and providing the full complement of backstop and guarantees that are necessary to definitively arrest a run. The focus should be on preserving broader market functioning, and protecting the stability of the essential core of the financial system, not in preventing the failures of individual firms at the weakest end of the solvency continuum. If you have an arsenal of tools to prevent/contain contagion and panic, then you can more safely allow the failure of the weakest.

8. An Assessment of the Emergency Authorities Going Forward: Where Do We Stand Today?

The Prudential Defenses Are Much Stronger

The post-crisis financial reforms in the U.S. include much more conservative constraints on risk taking, with tougher capital and liquidity requirements. These are applied across a much larger part of the financial system. The largest institutions, whose failure would be more damaging, are subject to tougher constraints relative to risk than smaller banks. Stress testing is an integral part of the new capital regime. The higher capital requirements will provide protection against more extreme losses and a much greater range of potential crises.

To a much greater degree than before the crisis, the capital regulations are supplemented by requirements for more conservative funding. These new prudential regulations can be extended beyond the banking system to other institutions. The limitations on individual institutions are complemented by clearer authority to establish margin requirements in repo and derivatives.

The structure of the U.S. financial system, however, still allows more opportunities for arbitrage around these constraints, and banks are a smaller share of the U.S. financial system than of the other major economies. Although substantially more conservative than the pre-crisis regulations, they were not designed to provide protection against the most extreme crisis. Losses in the latest recession were high, but they would have been much higher without the forceful use of monetary policy and fiscal policy. It will take a long period of good policy choices and benign economic conditions for the Keynesian arsenal to be restored to the level where it could provide the same forceful response as in this past crisis. Over time, if we have another extended period of relatively stable economic conditions as in the period before this crisis—the "Great Moderation"—markets will again be willing to finance a substantial amount of maturity transformation with leverage outside the banking system, and this process will erode these protections.

The Emergency Arsenal is Weaker.

The financial reforms have left the U.S. with a weaker emergency arsenal relative to most other major economies. On the positive side, the new resolution regime combined with much higher total-loss-absorbing capital requirements provide better tools for managing the failure of a major investment bank like Lehman in a less messy way than default and liquidation. On the negative side, many of the tools that were essential to resolve this crisis have been eliminated or curtailed.

The FDIC's ability to guarantee the broader liabilities of large complex bank holding companies has been limited and now requires Congressional authorization.

The Treasury's ability to use the Exchange Stabilization Fund to guarantee money market funds has been eliminated.

The Fed's emergency lending authorities have been curtailed. The Fed can no longer use the provisions of 13(3) to lend to a single institution as we did to facilitate the acquisition of Bear Stearns and to prevent the failure of AIG. These provisions can still be used to lend to a broad class of institutions, like we did for the primary dealers, or important funding markets, like the commercial paper markets. New disclosure requirements may make it less likely that eligible institutions will make use of these authorities because of stigma, which will limit their value at the point when they are most important.

The new resolution authority provides an elegantly designed solution to help limit the damage caused by the failure of a large complex financial institution, by limiting the scope of default to the obligations of the parent, allowing the operating subsidiaries, such as the banks and broker dealers underneath the parent, to continue to operate, and ensuring funding for the resolution would be available (the ultimate costs of which would be borne by the banking industry not the taxpayer). The new regime also allows for a brief stay on derivatives and other financial contracts. And by allowing the FDIC to leave behind the long term debt obligations of the parent to absorb losses, it creates a larger cushion of contingent equity ahead of the deposit insurance fund.

For institutions that are subject to the much higher capital requirements, this is a very promising approach for managing a large failure. We won't know how effective this will be until it is used. And with all its promise, it has some essential limitations.

Although it provides a potentially effective way to deal with the *idiosyncratic* crisis, the failure of a large institution in an otherwise relatively stable system, it was not designed for the *systemic* financial crisis, where the number of institutions at risk of failure is large, and the system is at the edge of panic. As we saw in 2008, interventions to prevent default by a large institution could still increase fears of the failure of others. And, as we also saw in 2008, imposing losses on the creditors of a bank in a crisis will tend to broaden and accelerate the run.

The scope of the higher capital requirements is not comprehensive and does not apply to significant parts of the banking system or to non-bank financial institutions. Resolution authority applied to these institutions would very likely entail default on some part of the failing firm's obligations.

Without the FDICs guarantee authority, the ability of the Fed to help facilitate the acquisition of failing financial institutions by using 13(3), and the ability to inject capital into parts of the financial system, the resolution authority alone is an inadequate defense against the extreme crisis.

Overall, the combination of the new constraint on risk-taking and the new resolution authority provides a better system than we had before the crisis for confronting less severe financial trauma. The higher capital requirements and more conservative funding should also help reduce the probability of the systemic financial crisis. But the new regime will not enable our successors to contain the damage to the economy from an extreme crisis or to break a classic financial panic. To do that, they will be required to request new authority from the Congress to provide guarantees and inject public capital into the financial system.

This new system of prudential safeguards and stronger resolution authority would be more effective for bank-dominated financial systems. It is less effective in the more complex financial systems of the United States, where the reach of both the constraints on risk and the reach of the safety net are more limited, a diverse mix of financial institutions can operate outside those limits, and the economy relies on a mix of other funding sources that do not depend on the balance sheets of banks.

Over time, it would be prudent for the United States to build a stronger emergency financial arsenal, with greater discretion for the Fed, the FDIC, and the Treasury, to provide the protections in a crisis that the market cannot provide on its own.

If we are to have a credible chance of limiting the probability of the potential damage caused by future crises, the U.S. needs a stronger arsenal of tools and more discretion in how to deploy those tools.

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Appendix: Chronology

TLSF. On Tuesday, March 11, 2008, the Fed announced the Term Securities Lending Facility, which would allow primary dealers to exchange their holdings of agency securities for Treasuries. This facility helped mitigate the impact of the emerging illiquidity of GSE securities. The market's reaction to the announcement was mixed. Whatever reassurance it brought was clouded by the view that it was designed to help Bear Stearns and by fears that our action reflected alarming concern about funding pressures on the major investment banks and more broadly.

Bear Stearns. On Friday, March, 14, we announced a back-to-back loan through JPMorgan to Bear Stearns to help Bear survive to the weekend. That Sunday, March 16, we announced that the FRBNY would take on a $30 billion portfolio of Bear's assets to help facilitate JPMorgan's acquisition of Bear. This marked the first use of Section 13(3) since the Great Depression. When JPMorgan raised the price it would pay for Bear, we renegotiated our agreement with JPMorgan so that they would absorb the first $1 billion of any loss on that portfolio.

PDCF. Also on Sunday, March 16, 2008, we established the Primary Dealer Credit Facility (PDCF) to allow the Fed's 20 broker dealers to borrow from the FRBNY against a set of relatively high-grade collateral. Primary dealers used the PDCF like depository institutions used the Fed's discount window, which provided these primary dealers with a liquidity source when funding was scarce.

The four remaining investment banks. FRBNY began informal "monitoring" of four remaining independent investment banks in cooperation with the SEC. In the weeks following the establishment of the PDCF, the FRBNY assigned teams to examine the liquidity positions of these financial firms. Our objective was to encourage them to move to adopt a stronger liquidity cushion, and reduce the risk they took false comfort from the new Fed backstop. This gave us more insight into their relative vulnerabilities and allowed us to see first-hand the ongoing erosion in Lehman's funding over the course of the following months.

IndyMac. FDIC intervened in the California thrift IndyMac after the bank failed on July 11. At the time of failure, IndyMac had approximately $32 billion in assets. All general unsecured creditors, subordinated debt, and stockholders were completely wiped out. IndyMac has yet to pay back $9 billion to depositors and $25 million to general creditors.

HERA. On July 13, Secretary Paulson asked Congress to pass legislation providing authority to place the GSEs Fannie Mae and Freddie Mac into conservatorship or receivership with funding from Treasury. On July 30, 2008, the government passed the Housing and Economic Recovery Act (HERA), which replaced the GSEs' existing regulators with the Federal Housing Finance Agency (FHFA) and enabled the FHFA to take the GSEs into funded conservatorship or receivership. HERA also gave Treasury authority to inject capital into the GSEs if necessary, effectively allowing Treasury to stand behind the GSEs' $5 trillion in combined securities and MBS.

Developments over the late spring/summer.

> **Drafting a framework**. Staff at Treasury, FRB, and FRBNY engaged in a broader effort to prepare for a more severe crisis by drafting the framework for additional emergency authority from Congress to "resolve" a failing investment bank, and to purchase assets or inject capital into the financial system.
>
> During this time, FRBNY pushed JPMorgan and BONY to raise margin requirements and limit their access to the riskier collateral in the $12 trillion tripartite repo market.
>
> **Lehman.** Treasury and Fed engaged in concerted effort to induce Lehman to raise capital or merge with a stronger partner. Lehman pursued a range of options, but none were successful, at least not on terms attractive enough to Lehman's management and board. Over the summer and into September, Lehman tried and failed to spin off a $30 billion portfolio of real estate assets, or SpinCo, as it was commonly known.

The GSE Conservatorship. The FHFA placed Fannie and Freddie into conservatorship on September 6, 2008. On September 7, Treasury established a line of equity with each GSE in the amount of $100 billion and immediately injected $1 billion of capital into each. That day, Treasury also entered into an agreement to purchase the GSEs' MBS and began purchases later in the month.

Lehman Weekend.

> **"Meeting of the families."** On Friday September 12, Geithner, Paulson and Federal Reserve Governor Kevin Warsh, a convened the heads of 12 banks and investment banks at the FRBNY to explore ways to prevent failures of Lehman, Merrill, and AIG.
>
> **Lehman declares bankruptcy**. In the early morning hours of Monday, September 15, Lehman Brothers filed for bankruptcy after Barclays pulled out of merger talks on Sunday. Over the next several days, the FRBNY lent between $40 and $60 billion a day to Lehman's U.S. primary dealer to help facilitate a more orderly unwinding of its approximately $67-72 billion of assets. Lehman's London administrator seized collateral in London.
>
> **Merrill sold to Bank of America**. Around the same time that Lehman filed for bankruptcy, Bank of America announced publicly that it had agreed to purchase Merrill Lynch for about $50 billion.

Exemption of section 23A. On September 14, Fed approved an exemption to section 23A of the Federal Reserve Act, allowing affiliates of banks to obtain financing from the Fed for assets that they would have financed using repo.

Reserve Primary Fund. Money Market Funds were struggling to satisfy redemptions and stopped buying commercial paper. This panic accelerated when the London administrator of the Lehman bankruptcy seized collateral. On Tuesday, September 16 the Reserve Primary Fund "broke the buck." The fund held $785 million in Lehman commercial paper, which it wrote down to zero within a matter of days before closing. The effect on the Reserve Primary Fund led to a general run on prime money market funds. During the week following Lehman's bankruptcy, investors withdrew $230 billion from money market mutual funds.

Loan to AIG. On September 16, FRBNY announced an $85 billion rescue package, in the form of a revolving credit facility, for AIG, aimed at alleviating liquidity pressures derived from collateral calls on AIG's CDS portfolios business. In return for access to the credit line, AIG was to post adequate and equally valued collateral and was to provide the government senior voting preferred stock convertible into 79.9% of AIG's common shares, held by an independent trust for the benefit of Treasury. Any utilization of the credit facility by AIG came with a commitment fee and penalty rate.

Swap lines with the G10. On September 16, the Federal Open Markets Committee (FOMC) delegated authority to establish swap lines to the currency subcommittee, enabling the Fed to establish swap lines with any of the G10 banks without requiring an official vote from the FOMC. On September 18, the Fed established swap lines with the Bank of Canada and Bank of England, and increased its swap lines with the European Central Bank (ECB) and the Swiss National Bank. On September 24, the Fed extended swap lines to the all the remaining members of the G10 except New Zealand (the Fed established a swap line with New Zealand on October 24).

TARP first request. After Lehman weekend, Paulson returned to Washington to consult with the President on new emergency authority. On Thursday, September 18, Paulson and Bernanke went to Congress and requested hundreds of billions of dollars for a new emergency authority. Paulson sent Congressional leaders his preliminary draft of TARP that weekend.

Money Market Mutual Fund Guarantee. On September 19, Treasury announced a preliminary guarantee of prime money market funds up to $50 billion. On September 29, Treasury officially announced a guarantee of the money market funds, which totaled approximately $3.4 trillion.

AMLF. On September 19, 2008, the Fed announced the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) under Section 13(3) of the Federal Reserve Act to provide funding in the form of nonrecourse loans to U.S. depository institutions, bank holding companies, broker-dealer subsidiaries, and U.S. branches of foreign banks. The AMLF was meant to create a market for asset backed commercial paper.

Fed purchased Fannie and Freddie's securities. On September 19, 2008, Fed announced its intent to purchase short-term debt from Fannie, Freddie, and the Federal Home Loan Banks (FHLBs). By the time that the program concluded on September 26, the FRBNY had purchased $14.5 billion in short-term agency debt.

Goldman and Morgan Stanley become Bank Holding Companies. On September 21, the Fed agreed to convert Goldman Sachs and Morgan Stanley into Bank Holding Companies, on the condition they each immediately raised additional capital. Goldman raised an aggregate $10 billion from Warren Buffett and a public offering. Morgan Stanley raised $9 billion from Mitsubishi. Although we wanted to make it appear like Morgan and Goldman had received additional protection as BHCs, both banks remained close to failure until Congress passed the Emergency Economic Stabilization Act on October 3. The EESA allowed Treasury to inject capital into both banks and enabled them to issue new debt backed by an FDIC guarantee.

FDIC intervened in Washington Mutual. On September 25, JPMorgan bought WaMu and took most of its liabilities, including its covered bonds and other secured debt. All of WaMu's equity was wiped out. In addition, WaMu's general creditors, senior debt holders, and subordinated debtholders lost nearly $15 billion.

Wachovia sold to Wells Fargo. On Monday September 29, the FDIC initially agreed to sell Wachovia to CitiGroup, invoking, for the first time in the crisis, the systemic risk exemption, which allowed the FDIC to guarantee liabilities of the holding company. On October 2, Wells Fargo, which had been in competition with Citi, submitted a better deal, offering to purchase Wachovia for $7 per-share. Wells' offer was seven times higher than Citi's offer and did not require FDIC assistance. Wells acquired Wachovia and none of Wachovia's creditors suffered losses since the FDIC never took the bank into receivership.

Swap lines with Mexico, Brazil, Korea, and Singapore. Emerging global markets, particularly those that had relied heavily on dollar funding, began facing serious strains in the wake of Lehman and its aftermath. Liquidity constraints in these markets caused many of their respective sovereign currencies to fluctuate and their CDS to rise. On September 29, the Fed established swap lines of $30 billion each for Mexico, Brazil, Korea, and Singapore. By extending swap lines to these four countries, the Fed attempted to counteract the capital flow reversal in these emerging markets. This action also marked the first time that the Fed had established swap lines with any of the four banks except Mexico.

Congress passed TARP. Congress did not pass an emergency funding bill on October 1. On October 3, however, Congress passed the Emergency Economic Stabilization Act, which included the Troubled Asset Relief Program. TARP provided Treasury a total of $700 billion to buy troubled assets, of which $350 billion was immediately available. The other $350 billion was contingent on additional Congressional approval. Treasury initially planned to use the funding to conduct mainly asset purchases, but Paulson officially shifted Treasury's strategy to mainly capital injections on October 13.

CPFF. The Fed announced the creation of the Commercial Paper Funding Facility on October 7 to provide liquidity to commercial paper issuers in the event that short-term financing was not available, intending to restart the short-term lending market. The FRBNY provided three-month loans to a new limited liability company, the CPFF LLC, which purchased highly-rated commercial paper from eligible issuers on top of a small facility fee.

Interest rate cuts. G10 central banks announced a coordinated interest rate cut on October 8, marking the first instance that the Fed had coordinated a reduction in interest rates with the 10 central banks.