

Rules for a Lender of Last Resort: An Historical Perspective

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1. Introduction

The lender of last resort (LLR) is one of the earliest and most crucial functions for a central bank. Instances of lender of last resort actions can be traced back through several centuries, at least since the advent of fractional reserve banking (Kindleberger 1978). Discussion about the appropriate policies central banks should follow as a LLR have long been intertwined with discussion over the appropriate rules that monetary authorities should follow to allay financial panics. Henry Thornton and Walter Bagehot were the pioneers in clearly stating the rules to follow. In this paper I define the concept of a LLR, then consider its historical origins in England and survey its history in the United States from the National banking era to the advent of the Federal Reserve. Much of the paper describes how the Fed evolved as a Lender of Last Resort in the Twentieth century.

The Fed was established primarily to prevent the banking panics that plagued the nineteenth century yet the Federal Reserve Act never spelled out exactly how the Fed was supposed to act as an LLR. This omission came to the fore in the Great Contraction 1929 to 1933 when the Fed failed to prevent four serious banking panics which turned a serious recession into the worst downturn in our history.

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Reforms in the 1930s corrected some of the failures of the original Federal Reserve Act and also clamped down on financial activity so that for 40 years there was little financial instability.

The financial instability problem returned in the 1970s with financial liberalization and the Fed became very active in heading off crises. However it changed its approach to LLR and abandoned Bagehot's and Thornton's strictures adopting the Too Big to Fail doctrine and constructive ambiguity. This shift in policy contributed to moral hazard and combined with ongoing financial innovation created new threats to financial stability with the rise of the shadow banking sector.

The subprime mortgage crisis of 2007-2008 prompted the Fed to take unprecedented LLR actions which helped allay panic. However its new actions opened up a Pandora's box of perils for the future. I conclude with an evaluation of the Fed's LLR policies and make the case for more rule like behavior.

The 2007-2008 crisis led to significant financial reform with parallels to the 1930s in the Dodd Frank Act of 2010. These are briefly evaluated in a postscript.

2. Some Definitions

A lender of last resort is a monetary authority who can allay an incipient banking panic—a scramble for liquidity—by timely assurance that it will provide whatever high powered money is required to satisfy the demand. A banking panic represents a widespread attempt by the public to convert their deposits into currency and in response an attempt by commercial banks to increase their reserve

holdings relative to deposit liabilities. A banking panic can occur in a fractional reserve banking system when an important bank failure or series of failures leads to bank runs which in turn become contagious threatening the solvency of otherwise sound banks. In a more modern context a lender of last resort needs to accommodate liquidity shocks before they have systemic consequences.

3. Origins of the Lender of Last Resort in England

The origin of the concept of lender of last resort goes back to the end of the eighteenth century in England when Sir Francis Baring referred to the Bank of England's role as a 'dernier resort' (Grossman 2010, page 99). The principal proponents of the concept were Henry Thornton (1802) who urged the Bank of England to allay a panic by lending freely to the money market on the basis of sound collateral. Walter Bagehot formulated Bagehot's Rule(s) in 1873: 1. In times of crisis the Bank should lend freely in the face of an internal drain (a liquidity crisis) and to discount all sound collateral; 2. to charge a high (above market) rate in the face of an external drain (an outflow of the Bank's reserves); 3. to lend freely at a high rate (often referred to as a penalty rate) when faced with both an internal drain and an external drain; 4. prevent illiquid but solvent banks from failing; 5. clearly state the policy in advance (Humphrey 1975, Bordo 1990).

To understand Bagehot's Rule(s) it is essential to understand the context of the financial system in England in the late nineteenth century. The key elements of that system were: a) adherence to the classical gold standard i.e. maintain convertibility of the pound sterling into a fixed weight of gold; b) that the Bank of

England was a joint stock , profit maximizing bank with public responsibilities; c) that it was operating in a very sophisticated and stratified financial system whose main components were: the Bank of England; merchant banks which financed trade; bill brokers who dealt in bills of exchange in a very deep and liquid market; discount houses which purchased and rediscounted bills of exchange and which served as an intermediary between the Bank of England and the banking system; the commercial banks.

Under the gold standard the Bank of England's gold reserve (the ultimate monetary base) had to clear international payments imbalances and serve as the base of the domestic financial system. Hence in the face of a liquidity shock or domestic banking panic, gold convertibility was sometimes temporarily suspended by a "Treasury Letter" to allow the Bank to supply the necessary bank notes to meet the liquidity demand. A temporary suspension only worked because adherence to gold was viewed as credible. For a private central bank to freely discount commercial bills it had to avoid credit risk. In the late nineteenth century the collateral that was taken in rediscount operations was two named bankers acceptances used to finance international trade. These bills were issued by reputable merchant banks (such as the Rothschilds). The Bank would also charge an above market rate on these loans to maximize its profits (Goodfriend 2012).

The Bank of England did not deal directly with individual banks in its LLR operations. It generally provided liquidity anonymously to the market. The commercial banks would turn to the discount houses to rediscount their paper, and

the discount houses in turn, would go to the Bank of England for accommodation. The Bank's discount rate 'Bank rate' served as the anchor to the financial system.

According to Capie (2002) "The mechanism can be envisaged as the central bank having a discount window made of frosted glass and raised just a few inches. Representatives of institutions could appear at the window and push through the paper they wanted discounted. The central banker would return the appropriate amount of cash, reflecting the going rate of interest. The central banker does not know, nor does he care, who is on the other side of the window. He simply discounts good quality paper or lends on the basis of good collateral. In this way institutions holding good quality assets will have no difficulty in obtaining the funds they need. Institutions with poor quality are likely to suffer. In times of panic the interest rate would rise."

The Bank of England was a chartered bank of issue with a public responsibility. It took the experience of a number of serious banking panics from 1825 to 1866 when the Bank acted to put its shareholders interest above that of the rest of the financial system, before it fully accepted Bagehot's (1873) Responsibility Doctrine to put the public's interest first.

4. The United States before the Federal Reserve

The evolution of a lender of last resort in the United States before the establishment of the Federal Reserve System in 1913 is a very different story from England and other advanced European countries. The U.S. had two attempts at central banking earlier in the nineteenth century with the First Bank of the United

States, 1791 to 1811, and the Second Bank, 1816 to 1836. Both banks were relatively successful in providing a uniform national currency and performing many central banking functions. The Second Bank of the United States under Nicholas Biddle encouraged and backed the development of a liquid market in bills of exchange and on occasion provided liquidity to correspondent banks in times of stress, actions similar to those taken by the Bank of England at the same time (Bordo 2012). In both cases the banks' charters were not renewed because of strong populist and states rights opposition to the Federal government's intrusion in banking and the concentration of financial power in the urban northeast. As a consequence the U.S. did not have a central bank from 1836 to 1914.

As a consequence the states had (until 1863) exclusive bank chartering privileges. This created a fragile undercapitalized unit banking system subject to region specific shocks. This was in sharp contrast to the experience in Canada and the advanced European countries which had nationwide branch banking systems under which risks could be pooled across regions.²

After the demise of the Second Bank of the United States, many states established Free Banking Laws which made it easy to set up a bank. The Free Banking experience from 1836 to 1863 was characterized by an imperfect payments system with a multiplicity of banknotes circulating at varying rates of discount, frequent and numerous bank failures, fraud (in some states) and several banking panics (Cagan 1963, Rockoff 1974).

² The key difference between the US and Canadian experiences was largely of political origin. In Canada the banks were chartered by the Federal government while in the US bank chartering was in the hands of the States. For explanations for this difference see Bordo, Redish and Rockoff (2014) and Calomiris and Haber (2014).

As a consequence the banking system was not the key provider of industrial finance. Non- bank financial institutions and financial markets --a prototype of shadow banking -- became a key source of the capital needed to finance American growth (Smith and Sylla 1993).

In reaction to the perceived flaws of the Free banking system, the Congress established the National banking system in 1863, during the Civil War, when the Southern states most opposed to federal banking authority were absent. It was intended to overcome the flaws of the preceding banking regime. The National banking system did succeed in creating a uniform currency in the form of national bank notes backed by U.S. government bonds and the national banks were better capitalized and well regulated by the Office of the Comptroller of the Currency and so were less failure prone than the free state banks.

However the National banking system had three serious defects that were responsible for several severe banking panics in the next five decades: 1) an inelastic currency stock—national bank notes, backed by U.S. government bonds could not easily be expanded during a panic and there was no longer a lender of last resort; 2) seasonal stringency in the money market which led to financial stress in the autumn contributing to several of the panics; 3) an inverted pyramid of the banking system's reserves—country and reserve city banks were allowed to keep part of their required reserves in the central reserve city of New York. These funds were invested in the call loan market collateralized by stocks. This linked financial shocks in the stock market and in the New York money market to the rest of the country. As a consequence the U.S. financial system was again financial crisis prone.

In the absence of a central bank, clearing houses in the principal cities acted as a quasi LLR by issuing emergency currency in the form of Clearing House Loan certificates (Timberlake (1984), Gorton (1985)). Beginning with the panic of 1857, the New York Clearinghouse issued loan certificates to its member banks based on the discounted value of the collateral they possess in proportion to each bank's share of the total assets of the Clearinghouse. These certificates served as substitutes for bank reserves which allowed member banks to pay out cash that otherwise would have been tied up in interbank settlements. The issue of clearing house certificates was sufficient to allay crises in 1884 and 1890 but not other crises in the era. The U.S. Treasury also intervened on occasion during panics to add reserves to the banking system by depositing tax and custom receipts in New York banks and by other methods. These interventions were often too little and too late. Banking panics in 1873, 1893 and 1907 ended only after the suspension of convertibility of deposits into currency.

5. The Origins of the Federal Reserve

The Panic of 1907 led to strident calls for reform and the creation of the Aldrich Vreeland Act of 1908. The Act permitted groups of 10 or more national banks to form currency associations to issue emergency currency in the event of a crisis. The Aldrich Vreeland Act was only used once, to stem a crisis in 1914 at the outbreak of World War I. The Act also created the National Monetary Commission to study and recommend on a U.S. central bank. The National Monetary Commission was headed by Nelson Aldrich, Chairman of the Senate Committee on Banking and

Currency. Aldrich was persuaded of the efficacy of the European style discount and central banking system by Paul Warburg, a successful German banker who had immigrated to the United States in 1902. Warburg argued that in the advanced countries of Western Europe the presence of a discount market and a central bank that provided liquidity to back up the market and serve as lender of last resort in times of stringency prevented the type of financial instability experienced in the United States (Bordo and Wheelock 2013). Warburg believed that a market for bills of exchange (two name bills), as exemplified by the market for bankers acceptances, would be more liquid than the existing U.S. commercial paper market (based on single name promissory notes). He believed that the U.S. money market would be more liquid if banks were permitted to issue bankers acceptances. He further believed that recreating as closely as possible the money market environment of England, France and Germany was a crucial step to bringing stability to the U.S. banking system.

Warburg first proposed in 1910 the creation of a U.S. central bank with 20 regional branches controlled by bankers but regulated by government officials. His United Reserve bank would rediscount bills of exchange (acceptances) for its member banks, thereby providing liquidity to the market and establishing a lender of last resort, following Bagehot's strictures to lend freely in a panic. Under his plan, the discount rate would be the key instrument of monetary policy, to be supplemented by open market operations to make the discount rate effective. The Aldrich bill (1912) was very similar to the Warburg Plan. The key difference was in its structure. It called for a National Reserve Association, headquartered in

Washington with branches across the country. The Federal Reserve Act passed in 1913 replicated the key monetary policy provisions of the Warburg plan and the Aldrich bill but changed the structure and governance completely—rather than a central organization with many branches, the Federal Reserve System consisted of twelve semi-autonomous regional Reserve Banks and the Federal reserve Board which had a general oversight role.

The Federal Reserve Act did not contain explicit instructions for how the Fed should respond in the event of a banking panic, i.e how it should serve as a lender of last resort. The framers believed that they had created a fool-proof mechanism that would prevent panics from occurring in the first place. It did not address sources of instability outside the banking system, e.g trust companies. Access to the discount window was limited member banks (mostly national banks) which precluded the majority of banks in the U.S. To address the problem of an inelastic currency the FR Act permitted member banks to rediscount eligible paper with Federal Reserve Banks in exchange for Federal Reserve notes or reserve deposits. Federal Reserve notes and member bank reserves were elastic in that their volume would vary with the amount of eligible paper that member banks rediscounted with the Reserve Banks, which in turn varied with fluctuations in the demand for currency and credit. Securities eligible for rediscounting were restricted to self-liquidating real bills of short-term duration “notes, drafts and bills of exchange arising out of actual commercial and agricultural loans”. Specifically excluded were bills to finance speculation. Finally, reflecting Warburg’s views, member banks could offer bankers

acceptances based on international trade which the Reserve Banks could rediscount or purchase in the open market.

6. The Federal Reserve as a LLR in the 1920s

Not many years after the Fed opened its doors, World War I required it to freely discount both private and government securities at below market interest rates—an inflationary finance approach followed by all central banks. The U.S. never left the gold standard during the war, unlike the other belligerents but imposed a gold export embargo from 1917 to 1919. Faced with gold losses which threatened its reserves and rising inflation, the Fed drastically raised its discount rate in 1919 leading to a short sharp recession and deflation from 1920-21. Unlike previous similar episodes of recession and deflation in the national banking era the 1920-21 downturn was not accompanied by a banking panic. Gorton and Metrick (2013) posit that this was because the Fed had been freely discounting member bank eligible paper. In other words that the Federal Reserve did act as a LLR. Despite numerous small bank failures, there were no episodes of banking distress or panic in the 1920s. The Fed also succeeded in ironing out seasonal variation in money market interest rates (Miron 1986). Seasonal accommodation was largely automatic as the Fed founders had intended. Thus it seemed that the Fed had indeed solved the problems that had produced recurrent banking panics in the past.

Strong public reaction against the Fed's tight discount rate policy in 1919 by agricultural interests led the Fed from the mid 1920s onward to downplay the use of the discount rate as its primary tool of monetary policy. Instead it used open market

operations to hit a borrowed reserves target (i.e it would force member banks to borrow at the discount window) and generally it kept the discount rate below the market rate. This moved the U.S. away from the Bank of England's Bagehot Rule model. Furthermore, according to Goodfriend (2012), the Fed unlike the Bank of England was not a private profit maximizing central bank and by keeping its discount rate below the market rate could take on credit risk.

Also in the mid 1920s the Fed began to discourage member banks from using the discount window. It was argued that member banks should borrow only on the basis of need (Wheelock 1991). In addition the Fed, concerned over speculation in the stock market began rationing credit in the spring of 1929 (Friedman and Schwartz 1963). This new Fed policy many have argued led to the problem of 'stigma' which has plagued the Fed ever since (Gorton and Metrick 2013).

7. The Federal Reserve as Lender of Last Resort in the Great Depression

The New York Fed reacted swiftly to the October 1929 Wall Street stock market crash. However the Fed largely ignored the banking panics of 1930-33 and did little to arrest large declines in the price level and real output. The Fed clearly failed to serve as a lender of last resort. Many studies have considered why the Fed allowed the Great Contraction to happen. The principal accounts are: 1. Friedman and Schwartz (1963) emphasize the Fed's decentralized structure and lack of strong leadership; 2. Wicker (1966), Wheelock (1991) and Meltzer (2003) contend that the Fed followed a flawed policy—the real bills doctrine. They misinterpreted the low levels of nominal interest rates and the low level of member bank borrowing as

signs of monetary ease; 3. Eichengreen (1992) and Temin (1989) focus on the role of the gold standard. Fed officials were reluctant to take any action that would threaten adherence to the gold standard.

Focusing more narrowly on the failure of the discount window, the key flaws were: 1. Restricted Fed membership. The Federal Reserve Act restricted access to the discount window to member banks, most of which were national banks. This left most of the nation's state banks out in the cold. 2. Limited Eligibility. The type of loans and securities eligible for rediscounting with Reserve banks were restricted to short-term commercial and agricultural paper and U.S. government securities. Many banks lacked paper that was eligible for rediscounting with Reserve Banks. 3. Stigma. Member banks were reluctant to borrow from the Fed in the event of a crisis. This was because since the mid 1920s, Fed officials tried to discourage banks from continuous borrowing, especially loans for the purchase of stocks. During the Depression, banks were reluctant to borrow because of the stigma that they would be perceived as weak.

Federal Reserve purchases of bankers' acceptances were a mechanism, in addition to the discount window, to supply currency or bank reserves in the event of a crisis. Although the Fed did make large purchases of bankers' acceptances during banking panics in the fall of 1931 and March 1933, the purchases were not large enough to offset the effects of currency and gold withdrawals from the banking system (Bordo and Wheelock 2013).

On top of these serious flaws in the instruments of Fed LLR policy, the Fed's decentralized structure proved unwieldy in responding to the financial crisis.

According to Friedman and Schwartz (1963), in the absence of effective leadership, the individual Reserve Banks acted competitively at critical points during the Depression. The best example of this was when the Chicago Fed, in March 1933, refused a request from the New York Fed to exchange securities when gold outflows threatened to push the New York's gold reserve ratio below its legal minimum. Also the Federal Reserve Act left considerable discretion to individual Reserve Banks and the Board for implementing policy. The Atlanta Fed, according to Richardson and Troost (2009), responded aggressively to allay local panics in its district in stark contrast to the St. Louis Fed which did not. The actions by the Atlanta Fed and the New York Fed in responding to the 1929 stock market crash suggests that the Federal Reserve had the tools and the power to respond effectively to financial crisis. But an effective response required a leader who was willing to improvise and test the limits of the Federal Reserve Act.

The Act did not provide an automatic, fool-proof mechanism to deal with crises, as the founders had hoped. Instead effective LLR action depended a great deal on the discretion of individual policy makers.

Finally the Federal Reserve Act failed to recreate the features of the European banking systems that made the Bank of England and the Reichsbank effective lenders of last resort in the late nineteenth and early twentieth centuries (Bordo and Wheelock 2013). These include nation wide branch banking and consolidation of the banking industry and the development of a U.S. bankers acceptance market.

The Fed's acceptance facilities was similar to the Bank of England's discount window in that the Fed purchased all of the eligible acceptances offered to it. The acceptance facility had at least two characteristics that seemed to be good LLR practice: 1. Lending was to the market, rather than to individual institutions or classes of institutions, against a standard financial instrument; 2. The facility entailed little scope for discretion, except in setting the bill buying rate. But banker's acceptances never became the core instrument of the U.S. money market and the acceptance market fell off sharply during the Depression. Thus the U.S. never developed the money market conditions that enabled European central banks to be effective lenders of last resort before World War I.

8. 1930s Reforms

In reaction to the Great Contraction which the Roosevelt administration largely blamed on the banks, major reforms of all aspects of the financial system were implemented. To prevent banking panics before they could start, federal deposit insurance (FDIC) was instituted in the Banking Act of 1933. Coverage was initially set at \$2500 to cover low to moderate accounts and has been subsequently been revised upwards many times. The Banking Acts of 1933 and 1935 made significant changes in the structure and authority of the Federal Reserve System. Policy making authority was concentrated within the Board of Governors and the Fed's lender of last resort authority was greatly enhanced so that it had the tools to do what it could not have done in the Great Contraction.

The Fed was now allowed to lend on the basis of any sound collateral and to lend to non-member banks in “exceptional and exigent circumstances” under Section 13 (3) of the Federal Reserve Act. Section 13 (3) first introduced in the Glass Steagall act of 1932 was expanded in the Acts of 1933 and 1935 and then later in the FIDICIA Act of 1991 (Carlson and Wheelock 2013). It was referred to extensively by the Fed in the recent financial crisis. However, according to Gorton and Metrick (2013) the stigma problem was not removed.

The banking system was also subject to major reforms to make it less prone to instability. These included the Glass Steagall separation of commercial banking from investment banking, regulation Q which imposed a ceiling rate on time deposits and the prohibition of interest payments on demand deposits.

9. The Quiet Period

The period from the late 1940s to the mid 1970s is referred to as the quiet period. There were no banking crises and very few bank failures. In addition to the regulations which really clamped down on risk-taking in the financial sector, the macro environment after World War II was one of relative calm. The Bretton Woods System (especially until 1968) was associated with rapid and stable economic growth, mainly mild recessions, low inflation and stable exchange rates (Bordo 1993). After the Federal Reserve Treasury Accord of 1951, under the chairmanship of William McChesney Martin the Fed had a decade and a half of good performance (Meltzer 2010).

10. The Return of Financial Crises; 1970 to 2000

Financial instability returned in the mid 1970s and has been with us ever since. The source of renewed instability was a deterioration in the macro economy. The run-up in inflation beginning in the mid 1960s and leading to the Great Inflation caused the regulatory regime to implode. This was enhanced by the collapse of the Bretton Woods system, the breakdown of capital controls and the advent of managed floating. Rising inflation and inflation expectations pushed up nominal interest rates. With regulation Q in place this led to disintermediation from the banking system into the Eurodollar market and other forms of non bank financial intermediation, especially money market mutual funds which later became known as the Shadow Banking System. Disintermediation from the banks and savings and loans led to a gradual dismantling of the regulatory machinery beginning with DIDMCA (1980) and Garn St. Germain (1988) which allowed banks and savings and loans to offer forms of interest bearing transaction accounts.

Other regulatory changes that occurred in the 1980s in response to financial innovation and growing financial turmoil, especially the Savings and Loan Crisis, included the elimination of barriers to interstate branch banking in the Riegle Neal Interstate Banking and Branch Efficiency Act of 1994 and the end of the Glass Steagall separation of commercial and investment banking in the Gramm Leach Bliley Act of 1999.

The period from 1970 to 2000 exhibited a number of banking crises and other forms of financial turmoil which the Federal Reserve, in sharp contrast to its behavior in the 1930s, followed very activist policies to contain. Banking crises in

this period were different from those in the 1930s and earlier. With the advent of deposit insurance, old fashioned banking panics disappeared and were replaced by expensive bailouts of insolvent firms. Also the Fed expanded its reach beyond the traditional 'line in the sand' of protecting the deposit taking institutions and the payments system, the Fed began to allay turmoil in the non bank financial sector.

The first event of the period was the Penn Central railroad bankruptcy in 1970. To protect holders of commercial paper from loss, the Fed, fearful of contagion to other markets, opened its discount window to the New York money center banks to encourage them to lend to back up the commercial paper market (Carlson and Wheelock 2013).

The second event was the bailout in 1974 of Franklin National bank which had made risky bets in the foreign exchange market. The justification for this violation of Bagehot's strictures was to prevent contagion to other banks. The third event was the bailout in 1984 of the insolvent Continental Illinois bank, the eighth largest bank in the U.S., on the grounds that it was too big to fail.

The fourth event was the lifeboat operation arranged by the New York Fed of LTCM, a hedge fund, which had made a disastrous bet on Russian sovereign debt. In some ways the rescue resembled the lifeboat operation arranged by the Bank of England in 1890 to save Barings, a very large merchant bank, and prevent a banking panic. LTCM was rescued on the grounds that to not do so would lead to huge losses to unknown counterparties.

The Fed's LLR policy in this period had no relationship to Bagehot. Following Goodhart (1985), Solow (1982) and others Bagehot's Dictum to not rescue insolvent

banks, was criticized on the grounds that it was not possible to distinguish illiquidity from insolvency during a crisis and that the failure of a large bank would disrupt financial intermediation and lead to contagion. This led to the Fed's adoption of the "Too Big to Fail" doctrine. In response to those who were concerned about moral hazard, Corrigan (1989), Giannini (1999) and others suggested that the Fed follow a strategy of 'constructive ambiguity', not declaring in advance which banks would be deemed large enough to fail.

10. LLR in the Crisis of 2007-2008

The subprime mortgage crisis which began in August 2007 originated in the shadow banking system, spread to the universal banks and then to the rest of the financial system. The challenges the Fed faced was to overcome the long standing stigma problem and the fact that the crisis stemmed from the burgeoning shadow banking system (Gorton and Metrick 2013). The Fed initially dealt with the liquidity crisis in the interbank market by easing the terms of access to the discount window, but as the crisis deepened and there were few responses, it established the Term Auction Facility (TAF) in December 2007 under which the Fed auctioned credit to depository institutions for up to three months to circumvent the ongoing stigma of turning to the discount window. TAF loans were three times greater than traditional discount window loans and went at a significant premium (Gorton and Metrick 2013 page 32). However debate continues over the effectiveness of TAF in improving liquidity. Taylor and Williams (2009) provide evidence that the TAF facility had little impact in reducing the Overnight index swap (OIS) , 3 month Libor

spread—a measure of risk and liquidity effects. This suggests that the problem was more one of counterparty risk—solvency—than liquidity.

The crisis worsened in March 2008 with the rescue of the investment bank, Bear Stearns, by JP Morgan, backstopped by funds from the Federal Reserve. The rescue was justified on the same grounds as earlier bailouts, that Bear Stearns exposure to counterparties was so extensive that a worse crisis would follow if it were not bailed out.

The March crisis led to the creation of a number of new discount window facilities which broadened the collateral available for discounting such as the Term Security Lending Facility (TSLF) under which Treasury securities were loaned to primary dealers against eligible collateral. These facilities were created under Section 13(3) of the Federal Reserve Act. It was the first use of section 13(3) since 1936 (Hackley 1973). It was followed by the Prime Dealer Credit Facility (PDCF), also justified under Section 13(3), to provide cash to investment banks and other primary dealers on terms close to those available to depository institutions (FCIR 2010 page 294).

Events took a turn for the worse when the Treasury and the Fed allowed the investment bank, Lehman Brothers to fail to discourage the belief that all insolvent institutions would be saved in an attempt to prevent moral hazard (See FOMC Transcript September 16, 2008, pages 36,48,49,51). It was argued that Lehman was both in worse shape and less exposed to counterparty risk than Bear Stearns. After the crisis, Bernanke (2012) argued that Lehman was allowed to fail because it was deemed insolvent and because the Fed lacked the legal authority to rescue it.

The next day the Federal Reserve (using section 13(3) to justify an \$85 billion loan) and the Treasury bailed out (for a total package of \$182 billion) and effectively nationalized the insurance giant AIG fearing the systemic consequences for collateralized default swaps if it were allowed to fail. The fallout from the Lehman bankruptcy then turned the liquidity crisis into a fully fledged global credit crunch and stock market crash as interbank lending and the whole elaborate network of funding for the shadow banking system effectively seized up on the fear that no financial institutions were safe.

To stem the post Lehman financial market panic the Fed invoked Section 13(3) of the Federal Reserve Act to extend the discount window to nonbank financial institutions and financial markets such as in the Term Asset Backed Securities Loan Facility (TALF). The Fed created special liquidity facilities to provide funding to the money market mutual funds which were hard hit by the collapse of Lehman (the Money Market Investor Funding Facility, MMIFF) and then to the commercial paper market that was funded by the MMMFs (the Commercial Paper Funding Facility, CPFA). Facilities for broker dealers, asset backed securities and many other institutions and markets were created. Bernanke (2012) justified the extension of access to the discount window as perfectly consistent with Walter Bagehot's strictures because they were backed by collateral (although not made at a penalty rate). These policies he argued prevented the collapse of the global financial system.

The crisis ended in the late fall of 2008 when TARP funds from the Treasury were used to recapitalize the major banks after a series of stress tests administered

by the Fed. The international crisis was eased after the Fed in October 2008 set up extensive inter central bank swap lines to keep international liquidity flowing.

Did the new LLR facilities established in the crisis of 2007-2008 work? They did in the sense that the financial crisis ended and we did not get a repeat of the global crisis in September 1931 but many problems ensued.

11. An Evaluation of the Federal Reserve's LLR Policies

Unlike the Great Depression experience when the Fed clearly failed in its LLR responsibilities, the Fed, by its actions in the recent crisis did allay the financial crisis. However the policies it has followed during the crisis, some of which date back to its founding have created problems for the future.

The reforms of the 1930s, including the consolidation of LLR power in the Board of Governors and the creation of section 13(3), allowed the Fed to take its activist and ultimately successful stance in the recent crisis. The stigma problem, the restricted access problem and the eligibility problems were removed. However the Fed's LLR action since the 1970s have moved it very far away from Bagehot's strictures and have opened up a Pandora's box of perils.

First since the Franklin National in 1974, the Fed has bailed out insolvent institutions which were deemed 'too big to fail'. This has led to moral hazard.

Second, the Fed has not generally lent at a penalty rate and indeed the discount rate has often been below the market rate. This according to Goodfriend (2012) has allowed it to take on credit risk.

Third, the Fed in the recent crisis has adopted credit policy—providing credit directly to markets and firms the Fed deemed most in need of liquidity. It has done this in contrast to anonymously delivering credit directly to the market via the Bank of England’s frosted glass window or via open market operations. The choice of targeted lending instead of imperial liquidity provision by the market has exposed the Fed to the temptation to politicize its selection of recipients of its credit (Schwartz 2008). Many of the Fed’s actions referred to by Goodfriend (2012) as credit policy—a form of fiscal policy—have impinged on the Fed’s independence and have weakened its credibility.

Fourth, the Fed as principal regulator since 1956 of bank holding companies failed to act upon the growing risk to the financial system from subprime mortgages and the financial innovation that allowed it to proliferate.

Fifth, the Fed has expanded its LLR function well beyond the traditional role of providing liquidity to solvent but illiquid deposit taking institutions and protecting the payments mechanism. This began with the 1970 Penn Central rescue of the commercial paper market and has expanded ever since justified on the grounds of systemic risk and contagion. The traditional central bank view that it would draw a line in the sand around deposit taking institutions and the payments system and let the rest of the payments system be taken care of by non central bank regulatory authorities has been jettisoned. As the Fed expands its responsibilities it erodes its independence and its ability to pursue its main goals of macro stability and lender of last resort.

Finally, the Fed has not followed Bagehot's principle that the central bank should state its lender of last resort policies clearly and in advance (Meltzer 2013). The approach taken by the Fed in the recent crisis was largely ad hoc and discretionary. The policy of rescuing Bear Stearns and AIG and letting Lehman go was inconsistent and created confusion in the financial markets. The LLR function, as other functions of central banking, should be rules based.

12. Postscript: The Dodd Frank Act of 2010

The Dodd Frank Wall Street Reform and Consumer Protection Act of 2010 was designed to prevent a repeat of the events in the 2007-2008 crisis. Like the legislation in the 1930s, it reflected public anger against the U.S. financial system and its regulators. The DFA contained a number of provisions pertaining to the Federal Reserve's role as a LLR. In addition to setting up mechanisms to prevent future bailouts of companies like AIG and permitting the FDIC to handle the resolution of insolvent non bank financial intermediaries like Lehman Brothers, it significantly altered the Federal Reserve's discount window lending authority in section 13(3) of the Federal Reserve Act. Title XI of Dodd Frank explicitly forbids the Fed from using its discounting tools to provide liquidity to an individual non bank financial intermediary regardless if it is insolvent or not. Its liquidity programs henceforth should be 'broad based'. Moreover before establishing programs like CPFF and the PDCF the Fed will need the Treasury's approval. Dodd Frank also requires the Fed to disclose to the Congress its counterparties and other conditions of its discount window lending within two years after termination of the program.

Some of these provisions (in theory) could move the Fed closer to a more Bagehot like LLR , which only lends to solvent but illiquid banks and which extends its lending (based on sound collateral) to the market. The difficulty, as has often been the case in the past, in implementing these actions in a real world crisis when a large systemically interconnected and politically connected financial firm or market gets into trouble is that the Fed will not follow through in implementing its policies. Regardless, lending only to the market would be a step towards Capie's frosted glass window which served the Bank of England so well a century ago.

Requiring the Treasury to sign onto a discount window operation in advance would compromise the Fed's independence from the fiscal authorities. It also would get in the way of rapidly implementing LLR policies where speed is of the essence. Also releasing information on counterparties to the Congress within two years seems to run counter to the Fed's efforts to avoid the stigma problem which has plagued it for decades. One Bagehotian prescription that was not present in the Dodd Frank Act is that the Fed should clearly announce its LLR policy in advance.

References

- Walter Bagehot (1873) *Lombard Street: A Description of the Money Market*.
London H.S. King
- Ben Bernanke (2012) *The Federal Reserve and the Financial Crisis*, Princeton:
Princeton University Press

- Michael Bordo (1990) “The Lender of Last Resort: Alternative Views and Historical Experience”, *Federal Reserve Bank of Richmond Economic Review* 76 (1)
- Michael Bordo (1993) “The Bretton Woods International Monetary System: An Historical Overview” in Michael Bordo and Barry Eichengreen (eds) *A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform*, Chicago: University of Chicago Press
- Michael Bordo and David Wheelock (2013) “The Promise and Performance of the Federal Reserve as Lender of Last Resort 1914-1933” in Michael D Bordo and William Roberds (eds) *A Return to Jekyll Island*. New York: Cambridge University Press
- Michael Bordo (2012) “Could the United States Have Had a Better Central bank? An Historical Counterfactual Speculation” *Journal of Macroeconomics* Vol 34, Issue 3 September pp 597-607.
- Michael Bordo, Hugh Rockoff and Angela Redish (2014) “Why Didn't Canada Have a Banking Crisis in 2008 (or in 1930,or 1907 or 1893)?” *Economic History Review* (in press)
- Philip Cagan (1963) “The Fifty Years of the National Banking system: An Historical Approach’ in *Banking and Monetary Studies*. (ed) Dean Carson. Homewood Illinois. Richard D. Irwin Publishers pp 15-42.
- Charles Calomiris and Stephen Haber (2014) *Fragile By Design: the Political Origins of Banking Crises and Scarce Credit*, Princeton: Princeton University Press

- Forrest Capie (2002) “The Bank of England as a Mature Central Bank” in Donald Winch and Patrick O’Brien (eds) *The Political Economy of British Historical Experience, 1688-1914*, Oxford: Oxford University Press pp 295-318.
- Mark Carlson and David C. Wheelock (2013) “The Lender of Last Resort: Lessons from the Fed’s First 100 Years” Federal Reserve Bank of Cleveland Conference “Current Policy under the Lens of Economic History. A Conference to Commemorate the Federal Reserve System” Centennial, December 13-14 2012.
- Gerald Corrigan (1990) “Testimony before the Senate Committee on Banking, Housing and Urban Affairs,” *101st Congress Second Session*, Washington DC May 3
- *Dodd Frank Wall Street Reform and Consumer Protection Act*. 2010
- Barry Eichengreen (1992) *Golden Fetters*, New York: Oxford University Press
- The Financial Crisis Inquiry Report. (2010) Washington GPO
- Milton Friedman and Anna J Schwartz (1963) *A Monetary History of the United States 1867 to 1960*, Princeton: Princeton University Press
- Curzio Giannini (1999) “Enemy of None But a Common Friend of All :An International Perspective on the Lender of Last Resort Function”, *Essays in International Finance* No 214 , Princeton: International Finance Section, June
- Marvin Goodfriend (2012) “The Elusive Promise of Independent Central Banking” *Bank of Japan-IMES Conference*. August
- Charles Goodhart (1985) *The Evolution of Central Banks*. London: London School of Economics
- Gary Gorton and Andrew Metrick (2013) “ The Federal Reserve and Financial Regulation: The First One Hundred Years” NBER Working Paper 19292

- Gary Gorton (1985) "Clearing Houses and the Origin of Central Banking in the United States" *Journal of Economic History*, 45, 277-283.
- Richard Grossman (2010) *Unsettled Account: The Evolution of Banking in the Industrialized World Since 1800*. Princeton: Princeton University Press.
- Howard Hackley (1973) *Lending Functions of the Federal Reserve: A History*. Washington D.C.: Federal Reserve Board of Governors.
- Thomas Humphrey (1975) "The Classical Concept of the Lender of Last Resort" *Federal Reserve Bank of Richmond Economic Review*, January/February, 61:2-29
- Charles Kindleberger (1978) *Manias, Panics and Crashes*, New York: Basic Books
- Allan Meltzer (2003) *A History of the Federal Reserve*. Volume 1 Chicago: University of Chicago Press
- Allan Meltzer (2010) *A History of the Federal Reserve*. Volume 2, Chicago: University of Chicago Press
- Allan Meltzer (2013) "Reforming the Federal Reserve for the 21st Century" Testimony House Financial Services Committee, Washington DC September 11
- Jeffrey Miron (1986) "Financial Panics, the Seasonality of the Nominal Interest Rate, and the Founding of the Fed" *American Economic Review*, 76 (91), 125-140.
- Gary Richardson and William Troost (2009) "Monetary Intervention Mitigated Banking Panics During the Great Depression: Quasi Experimental Evidence From a Federal Reserve District Bank, 1929-1933" *Journal of Political Economy* 107
- Hugh Rockoff (1972) "American Free Banking Before the Civil War: A Re: Examination" *Journal of Economic History* 32 (March) pp 417-420.

- Anna Schwartz (2008) “Origins of the Financial Market Crisis of 2008” *Cato Journal* Vol 29
- Robert Solow (1982) ‘ On the Lender of Last Resort’ in C. Kindleberger and JJ Lafargue (eds) *Financial Crises, Theory ,History and Policy*. Cambridge: Cambridge University Press
- Richard Sylla (with George David Smith) (1993), “The Transformation of Financial Capitalism: an Essay on the History of American Capital Markets” *Financial Markets, Institutions and Instruments* 2 No.2
- John Taylor and John Williams (2009) “A Black Swan in the Money Market”, *American Economic Journal: Macroeconomics* 1:1 pp 58-83
- Peter Temin (1989) *Lessons From The Great Depression*. Cambridge Mass: MIT Press
- Henry Thornton (1802) *An Inquiry Into the Nature and Effects of the Paper Credit of Great Britain*, edited by F.A. Hayek . Fairfield: Augustus Kelly.
- Richard Timberlake (1984) “The Central Banking Role of Clearing House Associations.’ *Journal of Money, Credit and Banking*, 16(1), 1-15
- David Wheelock (1991) *The Strategy and Consistency of Federal Reserve Monetary Policy, 1924-1933*. New York: Cambridge University Press
- Elmus Wicker (1966) *Federal Reserve Monetary Policy 1917-1933*. New York: Random House