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# The European Central Bank and the US Federal Reserve as Lender of Last Resort

**Summary:** Without a lender of last resort financial stability is not possible and systemic financial crises get out of control. During and after the Great Recession the US Federal Reserve System (Fed) and the European Central Bank (ECB) took on the role of lender of last resort in a comprehensive way. The Fed stabilised the financial system, including the shadow banking system. However, the chance to fundamentally restructure the financial system was not used. The ECB was confronted with sovereign debt crises and an incomplete integration of the European Monetary Union (EMU). It followed a kind of “muddling through” to keep the Euro area together. In the EMU not only a fundamental restructuring of the financial system is needed but also a deeper economic and political integration. The Fed and the ECB both were the most important institutions to avoid repetition of the 1930s.

**Key words:** Lender of last resort, Monetary policy, Financial crisis, Fed, ECB.

**JEL:** E42, E51, E52, E58, G01.

Balance sheets of Central banks exploded to unprecedented levels after the outbreak of the subprime financial crises in 2007. Central banks took on the role as lender of last resort in a comprehensive way. The European Central Bank (ECB) and the US Federal Reserve System (Fed) are of special interest because these two Central banks produce the two most dominant world currencies. There are several questions involved in this. Firstly, has the role of a lender of last resort been changing with the fundamental changes of the financial system which took place during the last 30 years? Secondly, in which dimensions did the Fed and the ECB take over the function as a lender of last resort, are there differences? Thirdly, how should we judge the interventions by the Fed and ECB?<sup>1</sup>

In the first part the function of a lender of last resort is analysed. In the second part a general overview about Central bank actions after the outbreak of the subprime financial crises in 2007 is given. Then, interventions by the Fed and the ECB are described in more detail. In the last part conclusions are drawn.

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## 1. The Function of a Lender of Last Resort

Only Central banks can provide legal tender and the asset with the highest liquidity. During a bank run it becomes clear that bank deposits are only substitutes for Central bank money. As Central banks have the monopoly to create the “last” money, they also have the responsibility to create Central bank money when it is needed. Central banks do not have the objective to make profits. From this perspective they are free to create money. Central banks also cannot declare bankruptcy or get liquidity problems with their own money, because they have the freedom to create as much money as they want. When private banks in panic do not lend to each other and there is a systemic liquidity shortage, Central banks have to start lending to institutions in need to prevent the collapse of the financial system. Of course, a Central bank would have the formal right not to lend. However, economic costs of such a policy would be high and the Central bank would fail to provide the public good of a stable financial system.

Even during times without stress in the financial system the discount window has to be kept open. This implies that Central banks can dictate the refinancing rate, but the refinancing volume is determined by commercial banks – depending on the market process. Thus, Central bank money supply becomes endogenous (see Nicholas Kaldor 1985, for an overview Marc Lavoie 2011).

The starting point of the theoretical debate about the function of lender of last resort is the classical analysis by Walter Bagehot (1873).<sup>2</sup> He believed the Central bank should be guided by four main principles:

i) It should lend freely. Last resort loans should be made “to merchants, to minor bankers, to this man and that man” (Bagehot 1873, p. 25). The lender of last resort function was interpreted in a comprehensive way;

ii) It should lend at a penalty rate. This should reduce moral hazard as the existence of a lender of last resort can lead to risky lending in the hope of privatising profits and socialising losses.<sup>3</sup> However, lending at high interest rates during a crisis is not very convincing. If only one bank has liquidity problems and there is no systemic crisis, a high interest rate policy, according to Bagehot’s recommendation, is fine. But during an endemic financial crisis, high interest rates intensify systemic risk further. High interest rates are not only a burden for commercial banks but they also increase the cash-flow problem for non-bank financial institutions, the enterprise sector, and also for indebted private and public households. High interest rates can quickly push economic units from a liquidity crisis into a solvency crisis. Low interest rates are, therefore, needed during a crisis. Moral hazard has to be solved by financial market regulation and the threat of losing property. This is exactly the conclusion drawn by Paul De Grauwe (2011, p. 8), who wrote under the impression of the Great Recession after the outbreak of the subprime crisis: “Liquidity provision

<sup>2</sup> Bagehot built partly on Henry Thornton (1802).

<sup>3</sup> To judge Bagehot’s recommendation for a high interest rate policy in a financial panic we should keep in mind that he recommended this under the Gold Standard before 1914 when fixed exchange rates and unregulated international capital flows existed. Under such a regime high interest rates in a financial panic had also the function to fight against capital outflows which would endanger the exchange rate system.

should be performed by a Central bank; the governance of moral hazard by another institution, the supervisor”;

iii) It should lend to any actors with good collateral. This principle is difficult to fulfil during a systemic financial crisis. Good collateral quickly becomes bad collateral when asset prices erode;

iv) It should lend to illiquid but not to insolvent institutions. Behind this idea hides the doctrine that insolvent financial institutions should not be saved by the Central bank. In principle this doctrine is correct. There is no need to save bankrupt financial institutions. However, a Central bank cannot easily distinguish between financial institutions with solvency problems and others with merely liquidity problems. For example, during a severe financial crisis a bank can be insolvent simply because its assets are temporarily valued at fairly low prices. A systemic liquidity crisis can easily be combined with or lead to a systemic insolvency crisis. In the latter case there are good arguments to finance even insolvent institutions during big financial crises, however, without rescuing the owners. Hence, a controlled bankruptcy is possible or a take-over by creditors, other institutions or the government, etc.

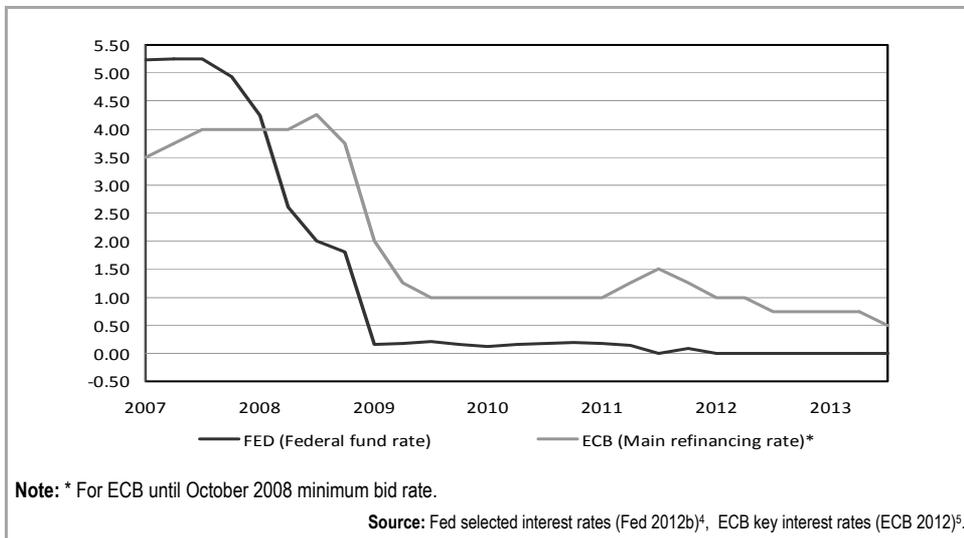
To sum up: During a financial crisis a Central bank should lend comprehensively at low interest rates. It should also accept poor collateral, and save systemic relevant institutions even if these are insolvent, however, the owners of such institutions should not be rescued.

## 2. The General Picture

Both, the Fed and the ECB, cut interest rates radically and kept them at very low levels when the crisis started (see Figure 1). Nevertheless, the interest rate level in the US is still lower than in the EMU. In 2011, the ECB increased the refinancing rate moderately. It had to cut back the interest rate because of the poor economic development in the Euro area. Overall, both Central banks followed a policy of very low interest rates, but the ECB acted more cautiously and less radical than the Fed – an observation which could be made before and fits to the different monetary policy philosophies and its different targets given politically (ECB has the dominant target of a low inflation rate below 2%, Fed aims at low inflation rates, high GDP growth and low interest rates) of the two Central banks (Hansjörg Herr and Milka Kazandziska 2011). Both Central banks did not follow Water Bagehot’s advice in applying high interest rates to punish too risky financial institutions.

The main function of the lender of last resort is to lend to entities which would not get credit otherwise. Already in 2007, but at the latest after the breakdown of Lehman Brothers in September 2008, the credit market between financial institutions broke down. The main explanation of this was uncertainty about the liquidity and solvency of financial institutions. Because of financial market deregulation starting in the 1970s, the whole financial system became so fragile and, at the same time, so non-transparent that institution could no longer determine whether other institutions were in danger of collapsing or not (Hao Fang, Yang-Cheng Lu, and Chi-Wei Su 2013). Their judgment was valid, because in deed many institutions had to be bailed out by governments and Central banks (Sebastian Dullien, Herr, and Christian Kellermann 2011). As part of the financial system was cut off from the money market

the Central bank became the market maker in this market – something usually known from banking systems in developing countries. Banks that needed liquidity were forced to go to the Central bank, whereas banks with excess liquidity hoarded Central bank money. Subsequently, banks started to hold free reserves at the Central bank.



**Figure 1** Money Market Interest Rates in the USA and EMU 2007-2013

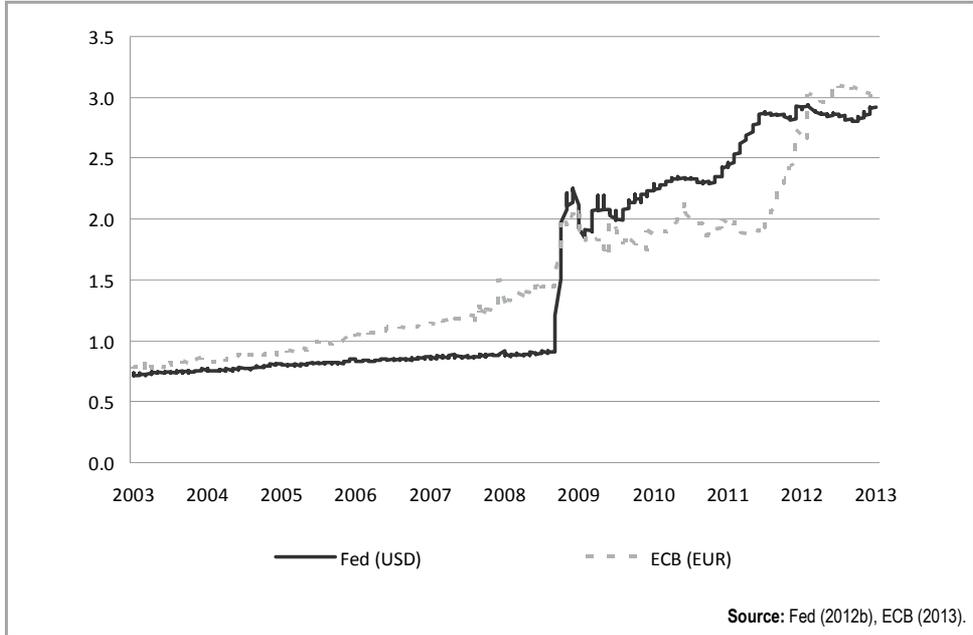
To a large extent the creation of Central banks money is demonstrated by the developments of the balance sheets of the Fed and the ECB. Both Central banks increased their asset holding – which is identical to money creation – from the beginning of the crisis in 2007 until 2013 by around 300% (see Figure 2).<sup>6</sup> However, the large amount of created Central bank money was not used by the financial system to give credits to the public. Instead, most of it was kept as excess reserves held by financial institutions (see Figures 3 and 4). This implies that the money creation by the Fed and the ECB did not reach the public via a credit expansion, for example, for investment. For this reason, all arguments claiming that the money creation after 2007 has inflationary repercussions are misleading. Due to the Great Recession and its lingering period of very low growth, the danger of a deflationary development in the USA and especially in the EMU is much bigger than the danger of inflation. Only when an economic expansion starts, the huge liquidity created could potentially finance an inflationary boom. However, such an expansion is not very likely in the short and medium term. In case of an inflationary boom the Central bank has sufficient instruments to fight the inflation. It can, for example, increase its refinancing

<sup>4</sup> **The Federal Reserve System - Fed.** 2012b. “Principal Economic Indicators.” <http://www.federalreserve.gov/datadownload/> (accessed June 15, 2012).

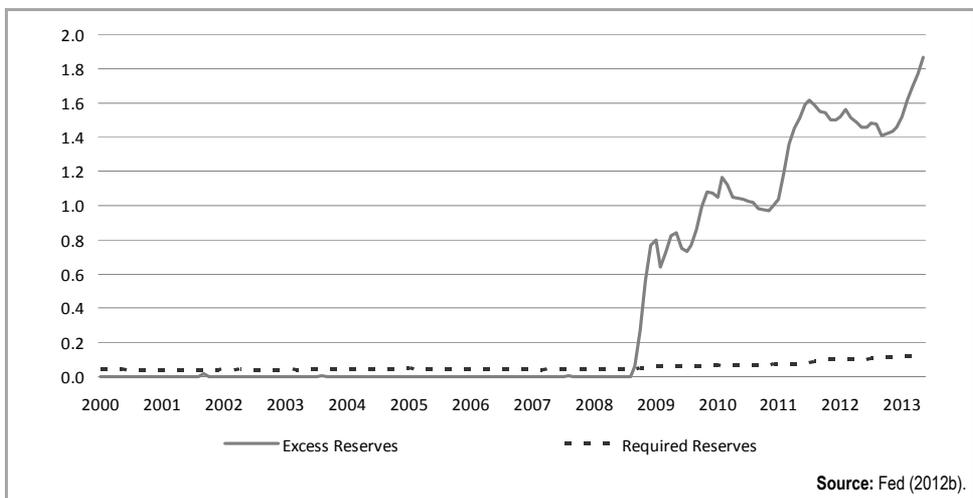
<sup>5</sup> **European Central Bank - ECB.** 2012. History of all ECB Open Market Operations. [http://www.ecb.int/mopo/implement/omo/html/top\\_history.en.html](http://www.ecb.int/mopo/implement/omo/html/top_history.en.html) (accessed July 15, 2012).

<sup>6</sup> The Bank of England increased its assets even more. The Bank of England is in many aspects similar to the Fed.

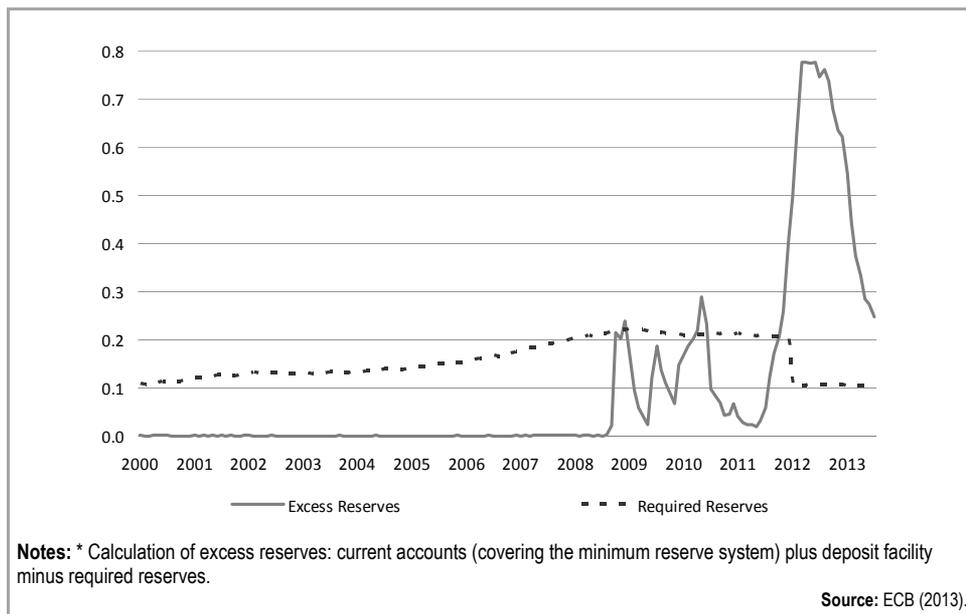
rate and at the same time increase minimum reserve requirements. Or it can issue its own Central bank bonds to absorb the liquidity.



**Figure 2** Total Assets Fed and ECB, Trillion National Currencies, 2003-2013



**Figure 3** Central Bank Money Reserve Holdings in the USA, Trillion US Dollar, 2000-2013



**Figure 4** Central Bank Money Reserve Holdings in the EMU, Trillion Euro, 2000-2013

### 3. Lender of Last Resort Policies in the USA

#### 3.1 The Fed's Policy in the First Phase of the Crisis

From 2007 until the collapse of Lehman Brothers, which was one of the biggest investment banks in the world, on 15th of September 2008, the Fed mainly used traditional tools to stabilize the money market and lowered its short-term interest rate dramatically to almost zero *per cent*. Normal open market operations were used to inject liquidity into the banking system. Furthermore, the Fed used its discount window to promote borrowing and to provide liquidity particularly to banks in need. Usually, the interest rate in the discount window is higher than for normal open market operations, however, this time the interest rate at the discount window was even lower. Nevertheless, the banks were reluctant to use the usual discount window because of reputational reasons. Therefore, the Fed started with, as it called it, unconventional measures during this period (see Table 1).<sup>7</sup> The main purpose of these interventions was trying to keep the money market liquid. There was one exception. In March 2008, the Fed bailed out Bear Stearns, one of the big US investment firms, to avert a sudden collapse of the company. Bear Stearns was later sold to JP Morgan Chase, a big US multinational banking and financial services company. Until mid' 2008, the interventions were quantitatively speaking not very significant. Also, total assets of the Fed did not increase because it reduced normal open market operations (see Figure 2).

<sup>7</sup> For all the tables see Gayane Oganessian (2013).

**Table 1** Fed's Lending Facilities between December 2007 and 2008

Facility	Main aim	Amount (billion USD) <sup>1</sup>	Term <sup>2</sup>
Central bank liquidity swap lines (CBLs)	Ease global dollar liquidity pressures	12,217	12/2007-02/2003
Term auction facility (TAF)	Overcome discount window use stigma	3,818	12/2007-05/2010
Primary dealer credit facility (PDCF)	Ease repo market liquidity strains	8,951	03/2008-02/2010
Term securities lending facility (TSLF)	Facilitate access to liquidity in funding markets	2,006	
TSLF options program (TOP)			
Ad hoc credit	Prevent bear sterns default	42	14/03/2008 and 20/09/2008

Notes: <sup>(1)</sup> Total amount lent out during the time span of the facility; <sup>(2)</sup> Time span of the facilities.

Source: James Felkerson (2011), Fed (2012a).

### 3.2 The Fed's Unconventional Measures in the Second Phase

Between September 2008 and the end of 2009, the Fed used a number of unusual measures (liquidity facilities) to take on the role of a lender of last resort in a very comprehensive way. In this period the assets held by the Fed increased by around 100 *per cent* (for an overview see Table 2).

Several measures were taken to stabilize the money market. Among other things and in contrast to Bagehot's recommendation, the Fed broadened the eligibility of collaterals.

In a second group of facilities the asset-backed security market was stabilized. Asset-backed securities became one of the centers of the financial crisis, as the US financial system shifted risky mortgage loans to financial institutions outside the regulated banking system before 2007. These institutions securitized (partly) very risky credits of all types and sold them to investors all over the world, whereas commercial banks themselves bought part of the financial products created. The market for securitized risky credits broke down during the financial crisis.

The Money Market Investor Funding Facility (MMIFF) was created in October 2008 to provide additional liquidity to large enterprises. The Fed bought, for example, \$45.1 billion in commercial paper from the credit arms of five automakers (Ford, BMW, Chrysler, General Motors and Toyota) between October 2008 and June 2009. The Fed also lent \$13 billion to investors, who bought bonds backed by loans for new car buyers. The credit arms of Ford, Chrysler, Nissan, Volkswagen, Honda and Hyundai all benefited directly (Justin Hyde 2010).<sup>8</sup>

<sup>8</sup> Thus, even though General Motors and Chrysler were officially bailed out by the Treasury, the Fed essentially lent \$57.9 billion to the auto industry – including \$26.8 billion to Ford, Toyota and BMW (Hyde 2010).

In 2008, the Federal Reserve Bank of New York created three limited liability companies referred to as Maiden Lane. Maiden Lane was already created in March 2008 to facilitate the acquisition of Bear Stearns by JP Morgan. Interestingly, Lehman Brothers was allowed to fail. After the collapse of Lehman Brothers, the Fed basically financed the nationalization of the American International Group, Inc. (AIG), one of the world biggest insurance companies, via Maiden Lane II and AIG's credit default swap division via Maiden Lane III.<sup>9</sup>

In 2008, the Fed began to buy Federal Agency Debt Securities to massively support the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac), the two US mortgage credit giants. In the same year both companies were taken over by the US federal government.

**Table 2** Fed's Lending Facilities Initiated between September 2008 and November 2009

Facility	Main aim	Amount (billion USD) <sup>1</sup>	Term <sup>2</sup>
Asset-backed commercial paper money market mutual fund liquidity facility (AMLF)	<ul style="list-style-type: none"> <li>▪ Foster liquidity in asset-backed commercial paper market and money markets</li> <li>▪ Liquidity backstop for money market mutual funds</li> <li>▪ Stop money market mutual funds from selling of assets to meet redemption demands and halt asset price deflation</li> <li>▪ Promote money market mutual funds investment in money market instruments</li> </ul>	217	09/2008-02/2010
Commercial paper funding facility (CPFF)	<ul style="list-style-type: none"> <li>▪ Initiated because money market mutual funds were reluctant to buy commercial paper</li> <li>▪ Restart flow of credit to real economy</li> </ul>	737	10/2008-02/2010
Money market investor funding facility (MMIFF)	<ul style="list-style-type: none"> <li>▪ Promote investment in money market instruments</li> <li>▪ Provide liquidity to money market mutual funds</li> </ul>	No loans were made	10/2008-10/2009
Term asset-backed securities loan facility (TALF)	<ul style="list-style-type: none"> <li>▪ Support asset-backed securities markets and prices</li> <li>▪ Facilitate issue of asset-backed securities collateralized by consumer &amp; business loans</li> </ul>	71	11/2008-03/2010
Ad-hoc credit	<ul style="list-style-type: none"> <li>▪ Finance nationalization of AIG</li> </ul>	161	09/2008

**Notes:** <sup>(1)</sup> Total amount lent out during the time span of the facility; <sup>(2)</sup> Time span of the facilities.

**Source:** Felkerson (2011), Fed (2012a).

Taking all these unusual measures into account their volume increased from zero in 2007 to \$1500 billion by the end of 2008. The actions by the Fed, which extended credit to commercial banks, other financial institutions as well as to big companies, were unprecedented and exceptionally rapid and proactive and had not been seen since the Great Depression. In a speech at the end of 2008, Fed President Ben S. Bernanke (2008) correctly spoke about extraordinary steps: "To ensure that adequate liquidity is available, consistent with the Central bank's traditional role as the liquidity provider of last resort, the Federal Reserve has taken a number of extraordinary steps". Until early 2010 almost all of the liquidity facilities mentioned above were reduced to zero again. However, the Fed's balance sheet did not decrease (see Figure 1). This leads us to the third period.

<sup>9</sup> The Fed owned 80% of AIG's stocks and a sum of \$85 billion was involved (Edmund L. Andrews 2008).

### 3.3 The Fed's Quantitative Easing

The Fed announced its plan to use quantitative easing in March 2009, a few weeks after the Bank of England successfully introduced the same strategy. Quantitative easing meant to extend open market operations. This was also the first time that the Fed bought longer-term government securities. Quantitative easing was carried out to such an extent that it compensated the reduction of all special liquidity facilities and even increased the assets held by the Fed substantially. The quantitative easing policy was not aimed at financing the central government. There was no lack of demand for US government bonds. Its main target was to flood the economy with liquidity to trigger an economic recovery. However, it is noteworthy that the Fed also started to buy large quantities of mortgage-backed securities (see Table 3). This means that the Fed not only stabilized the market for mortgage-backed securities, but also indirectly bailed out financial institutions with liquidity and potentially solvency problems by buying “bad” assets from them.

**Table 3** Fed's Quantitative Easing

Long-term securities purchase program (LSP)	Main aim	Amount (billion USD) <sup>1</sup>	Term <sup>2</sup>
Longer-term treasury securities	<ul style="list-style-type: none"> <li>▪ Improve conditions in private credit markets and the financial system as a whole</li> <li>▪ Support bond prices</li> <li>▪ Lower longer-term interest rates</li> <li>▪ Ensure that inflation is at the level set by the mandate</li> </ul>	1,645 (31/10/2012)	03/2009 on-going <sup>3</sup>
Government sponsored enterprises (GSE) debt obligations (issued by Fannie Mae, Freddie Mac, etc.)	<ul style="list-style-type: none"> <li>▪ Reduce cost and increase availability of credit for purchases of houses</li> <li>▪ Narrow spreads between rates on GSE direct obligations and US treasury debt</li> </ul>	175	11/2008- 11/2009
Mortgage-backed securities	<ul style="list-style-type: none"> <li>▪ Encourage economic recovery</li> <li>▪ Lower long-term interest rates</li> </ul>	852 (31/10/2012)	11/2008 on-going <sup>3</sup>

**Notes:** <sup>(1)</sup> Total amount lent out during the time span of the facility (including the date given); <sup>(2)</sup> Time span of the facilities; <sup>(3)</sup> At the time of writing the paper in August 2013.

**Source:** Felkerson (2011), Fed (2012a), Thorvald G. Moe (2012).

### 3.4 The Role of the Shadow Banking System

The huge shadow financial system in the USA shaped the interventions of the Fed as lender of last resort. In this sector we find institutions like hedge funds, money market mutual funds, securities lenders, structured investment vehicles, asset-backed commercial paper conduits or finance companies. All of these institutions are risk loving, speculative, and short-term oriented and operate with huge leverages. At the same time the shadow financial system is almost not regulated and created many financial innovations like asset-backed securities or credit default swaps. Institutions in the shadow financial system have no explicit access to Central bank liquidity and there are no government guaranties (as for example for partial coverage of the liabilities of commercial banks and insurance companies). There are three close links between the commercial banking system and the shadow financial system. Firstly, the high leverage of shadow financial institutions is only possible because of credits from commercial banks, which in many cases financed speculative activities by refinancing themselves via the Central bank. Secondly, commercial banks own shadow

institutions. Thirdly, banks buy risky products from shadow financial institutions like securitised papers or use services by shadow institutions like credit default swaps. Of course, such a development was only possible because the Glass-Steagall Act of the 1930s was reformed in the 1980s and finally repealed in the 1990s.

During the 1950s, the shadow financial system measured in *per cent* of total banking was below 10% in the US, whereby the remaining part consisted of conventional banking. In the early 1980s, shadow financial activities had a share of around 20% and then started to explode. During the 2010s, the shadow financial system became bigger than the normal banking system (Zolta Pozsar et al. 2012). The quantitatively huge interventions by the Fed were caused by the instability in the accumulation of bad debts especially in the shadow financial system and the close links between commercial banks and shadow financial institutions. As soon as a relevant shadow financial system exists, the function as a lender of last resort becomes more comprehensive and goes beyond the scope of stabilising commercial banks.

The Fed's heavy interventions that aimed at stabilising the US financial system led, as shown in Figure 3, to huge excess reserves held by financial institutions. Through precautionary motives banks may prefer to hoard liquidity, which partly explains these excess reserve holdings. But this motive cannot explain the huge reserve holdings after 2008 as financial institutions could rely on the help of the Central bank in case of liquidity problems. Therefore, these huge excess reserve holdings suggest a different explanation. One part of financial institutions in the US can be judged as "bad" relying on intensive help from the Fed, the other part can be judged as "good". Money flows from the Central bank to the "bad" financial institutions through refinancing, for example, when the Fed buys mortgage-backed securities. As soon as these "bad" institutions have to balance negative net cash flows with "good" financial institutions, the Central bank money flows to the "good" institutions. This is very likely because the public and other financial institutions shift their assets from "bad" to "good" financial institutions whereby the "bad" ones get cut off from the money market. The "good" financial institutions accumulate Central bank money reserves because they have no relevant refinancing from the Fed left they could pay back and, therefore, simply have no possibility to reduce their reserve holdings. They are forced to keep the reserves as excess. They could potentially lend to the "bad" financial institutions or the public, but this is seen as too risky (Todd Keister and James McAndrews 2009). Excess reserve holdings burden banks with assets of no return and reduce their profitability.

In October 2008, the Fed started to pay interest on reserves – a practice the ECB followed since its existence in 1999. This helped to stabilise the profitability of financial institutions with huge reserve holdings. It also allows the Fed to increase the money market interest rate if desired in the future.

The US financial system, which developed after World War II, is a market based system and, hence, differs to the bank based system in continental Europe. In capital based systems big companies are extraordinarily depended on the capital market, especially on issuing debt securities, to (re)finance themselves. Since the 1970s, changes in the financial system strengthened this tendency even further. The sub-prime financial crisis showed that big companies can quickly be cut off from finan-

cial markets. As a result, the question whether the function of the lender of last resort should be extended to the liquidity needs of big companies that dependent on capital markets remains open. The Fed understood its function as a lender of last resort in such an extensive way that it also created liquidity for big US firms. This is in line with Bagehot's (1873) comprehensive understanding of the lender of last resort function.

### **3.5 Did the Fed Save too Many Institutions?**

Bagehot (1873) argued that insolvent financial institutions should not be refinanced by Central banks. In principle this is correct. But, as mentioned above, it was argued that in a systemic crisis, a Central bank also has to help insolvent institutions under certain conditions. Did the Fed find a balance between fighting a systemic crisis and bailing out insolvent institutions? Was there an alternative to the complete bail-out of financial institutions with the exception of Lehman Brothers?

Joseph Stiglitz (2010, p. 134) argued: "The government lavished money on the big financial institutions that had made the biggest mistakes – some of whom didn't do much or any lending. The AIG bailout was particularly foolish. (...) When the data on where the AIG money went finally became available, it was clear that little of it went to systematically significant institutions – though that was the argument put forward in its defence". Stiglitz (2010) suggested that it would have been possible to let shadow financial institutions collapse and to build a "firewall" around the commercial banking system and pension funds for protection, as these were important institutions for the working of the financial system and society. It became apparent that, by rescuing the banking system as well as shadow financial institutions, the Fed and the US government lacked the will and vision to fundamentally restructure the financial system despite the fact that it had become dysfunctional and harmful for economic development. Barack H. Obama, elected President of the US in 2008, mainly followed the policy of his predecessor George W. Bush. "The Obama administration didn't bring a really fresh approach. (...) From the start, the administration didn't ask the right question about the kind of financial system the country wanted and needed, because such questions were uncomfortable, both politically and economically" (Stiglitz 2010, p. 111). Obama would have had the historical opportunity to fundamentally restructure the financial system. He could have done something similar to President Franklin D. Roosevelt, who became US president in 1933 and immediately after his election separated commercial from investment banking. In the USA this would have meant to use the lender of last resort function in a more selective way as part of a general restructuring of the financial system.

## **4. Lender of Last Resort Policies in the EMU**

### **4.1 The ECB's Longer-Term Refinancing Operations (LTRO)**

After the outbreak of the subprime crisis, there were two main waves of liquidity creation by the ECB. The first started in 2007 but gained speed in autumn 2008; the second started in 2011 (see Figure 1). In comparison to the Fed, the ECB concentrated its function as lender of last resort on the banking system. It did not lend to

shadow financial system directly nor to financial arms of big enterprises. Additionally, the ECB did not directly finance big takeovers in the financial system or government sponsored enterprises like Fannie Mae and Freddie Mac. In this context, the lender of last resort function of the ECB was less comprehensive. The explanation for these differences can mainly be found in the different structure of the financial system in the USA and in continental Europe. In the EMU, the shadow financial system did not play such a big role as in the USA and firms were less dependent on capital markets in general. There were also no EMU-wide institutions like Fannie Mae and Freddie Mac. In Germany, for example, the financial system still is relatively conservative (Daniel Detzer et al. 2013). In the EMU, financial institutions also had severe problems, for example some German banks (because they bought toxic foreign financial products) or some banks in Spain (because of the end of the huge real estate bubble in Spain) or in Ireland (because of the collapse of shadow financial institutions which developed in Ireland because of its loose regulations). Nevertheless, these problems were always regional and, thus, had to be solved by regional governments mainly. In all EMU countries the bailout of insolvent financial institutions increased public debt substantially.

The financial crisis hit the EMU slightly later than the US. In 2007 and until the breakdown of Lehman Brothers in autumn 2008, the ECB based its policy on cutting the interest rate and using its normal main refinancing operations (weekly operations) to provide the commercial banking system with liquidity. After the collapse of Lehman Brothers, when money markets in the EMU also broke down, this measure was no longer sufficient. In October 2008, the ECB included the LTRO with maturities of 6 or even 12 months to its normal financing. The LTRO gave commercial banks unlimited excess to liquidity at a fixed interest rate subject to adequate collateral (ECB 2011) (see Table 4). In the following years, refinancing via LTRO increased substantially, whereas the volume of normal refinancing dropped as it became a less attractive option. In addition, as in the USA, a wider range of securities with lower quality were allowed as collateral.

In the EMU financial system, covered bonds play an important role in many countries. In 2009 and 2011, the ECB started a small program to buy covered bonds and to keep them until maturity. This program aimed at keeping the covered bond market liquid.

## **4.2 The Securities Markets Programme (SMP) and the Lack of Lender of Last Resort for Governments**

Outright holding of debt securities, which played under quantitative easing a key role in the US, were insignificant in the EMU. At the beginning of the crisis, outright holding of debt securities by the ECB was absolutely unimportant. They increased slowly and reached a volume of around 600 billion Euro in July 2013 (ECB 2013) – still small compared to the US. Part of the outright holding of debt securities is based on the SMP. Behind this program is the half-hearted attempt of the ECB to solve the sovereign debt crisis. In May 2010, when the sovereign debt crisis escalated first in Greece, the ECB started the SMP with the aim to address severe tensions in capital

**Table 4** ECB's Lender of Last Resort Measures

Facility	Main aim	Target	Operation	Amount (billion, euro) <sup>1</sup>	Term <sup>2</sup>
Longer-term refinancing operations (LTRO) including "Big Bertha"	Relieve bank funding pressures	Euro area banking system	<ul style="list-style-type: none"> <li>▪ Fixed rate tender procedure with full allotment, 1-year and 3-year maturity</li> </ul>	1,700 (01/03/2012)	06/2009 on-going <sup>3</sup>
Covered bond purchase programs	Improve funding conditions and promote lending	Credit institutions and enterprises	<ul style="list-style-type: none"> <li>▪ Primary and secondary market purchases of EMU covered bonds</li> <li>▪ ECB holds the purchases bonds until maturity</li> </ul>	76,418	07/2009-06/2010 and 11/2011-10/2012
Securities market program (SMP)	Restore monetary policy transmission mechanism	Mainly government bond market	<ul style="list-style-type: none"> <li>▪ Secondary market purchases of private and public debt securities</li> <li>▪ Purchases are sterilized</li> </ul>	210	05/2010-09/2012
Outright monetary transactions	Address distortions in government bond markets		<ul style="list-style-type: none"> <li>▪ Secondary market purchases of sovereign bonds</li> <li>▪ Pre-condition: macroeconomic adjustment program</li> <li>▪ Purchases are sterilized</li> </ul>	Unlimited	06/2012 on-going <sup>3</sup>

**Notes:** <sup>(1)</sup> Total amount lent out during the time span of the facility (including the date given); <sup>(2)</sup> Time span of the facilities; <sup>(3)</sup> At the time of writing the paper in August 2013.

**Source:** ECB (2012c, d).

markets.<sup>10</sup> It basically bought debt securities in secondary markets issued by EMU countries with a sovereign debt crisis (ECB 2010). During this period the volume of the SMP increased to around 80 billion Euros. In the summer 2011, the sovereign debt crisis escalated again. As a result, the ECB increased its SMP to over 200 billion Euros.<sup>11</sup> Until July 2013, the volume increased to 250 billion euros accounting for one tenth of the ECB balance sheet (ECB 2013). Through this channel, the ECB would have had immense room to buy more debt securities from countries with financing problems.

The sovereign debt crisis escalated in summer 2011 because it became clear that the austerity programs, which were implemented by crises countries, intensified the crisis. It was a simple mistake to reduce government demand or to cut nominal wages in the middle of a severe economic crisis. Deflationary tendencies caused by poor economic development and high debt levels throughout the economy created additional problems to the banking system in crises countries. During this phase, the EMU headed towards a double-dip in 2012. In spite of the funds created by EMU

<sup>10</sup> The sovereign debt crisis and the fiscal policy which was followed did not allow a recovery of the EMU as a whole (see for this for example Stephanie Kelton 2011).

<sup>11</sup> The SMP program was rejected by the German members of ECB's Governing Council. Jürgen Stark, Chief Economist of the ECB, left the ECB in September 2011. Already earlier in the same year German Bundesbank President Axel Weber stepped back. Stark and Weber attacked the SMP as a violation to the rule not to finance public households by the ECB.

governments, designed to help crisis countries under strict conditions - the European Financial Stability Facility from 2010 with a volume of 440 billion Euros and the European Stability Mechanism from 2012 with a volume of 500 billion Euros - the sovereign debt crisis was not brought under control. International capital markets simply did not exclude the insolvency of governments in crisis countries. The fundamental problem was that the funds are sufficient to stabilise governments in smaller countries, but an insolvency of Spain or Italy cannot be shouldered by the two funds. In a speech at an investment conference in London on 26th July, 2012, Mario Draghi, ECB President, spoke crucial words about containing the sovereign debt crisis at least for some time: "Within our mandate, the ECB is ready to do whatever it takes to preserve the Euro. And believe me, it will be enough" (ECB 2012b, p. 1). With this sentence he announced that the ECB takes on the role as a lender of last resort for governments in EMU countries. However, the ECB will only grant support when the country asks for help from the European Stability Mechanism and accepts its conditionality, which has been decided by the so called "Troika", defined in cooperation with the ECB, the European Commission and the International Monetary Fund.

There is a high likelihood that - in "normal" nation-states - Central banks would finance central governments with (re-)financing problems, which can help local governments if needed, in one or the other way. It is not imaginable that central governments would simply be cut off from credit markets. In such a circumstance governments would need to dismiss teachers, policemen or soldiers, or stop payments to elderly and poor people, etc. The political costs associated with a collapse of society caused by a financial collapse of the government would be catastrophic. A financial collapse of a central government has systemic economical (and political) repercussions similar to an endemic crisis and the collapse of the financial system. This scenario makes it highly probable that a Central bank finds ways to finance the government. However, depending on institutions, like the degree of independence of the Central bank, and the political situation it cannot be excluded that governments are pushed to harsh and destructive measures before Central banks finance public budgets. Also, a complete failure to do so cannot be excluded. An example for this is the Great Depression in the US in the early 1930s.

On a theoretical level at least for central governments, the Central bank should take on the role of a lender of last resort. The justification of this is that the Central bank does not only have to provide the public good of a functioning financial system but also the public good of a functioning central government during a crisis. Of course, under certain conditions direct financing of budget deficits can lead to serious inflationary developments. Therefore, financing budget deficits through Central banks has to remain an exception to avoid a severe economic and in the end also a political crisis.

The sovereign debt crisis in the EMU is a clear case for dysfunctional financial markets, which led to severe problems for governments in crisis countries. It also reflects that the EMU is a political project and not an optimal currency area (Casmir Dadak 2011). It would have been the task of the ECB to provide the public good of a functioning government by taking over the function of financing the public

budget deficit in crises countries. However, for the ECB direct financing of public households is strictly forbidden independent of the circumstances (Article 107 of the Treaties on the functioning of the EU).<sup>12</sup> A traditional central government, which would help and control governments at lower levels during a crisis, does not exist in the EMU. At the same time, the crises countries within the EMU have lost their own Central banks that function as a lender of last resort. They can become insolvent and illiquid in their own currency – a situation which is usually not possible in a nation-state. Actors in financial markets had no problems to understand the situation in the EMU and demanded an ever increasing risk premium from these countries by threatening to interrupt the flow of credit. There is, of course, the possibility that the ECB finances the different governments in the EMU indirectly via state banks or normal commercial banks, which continue to lend to EMU governments during a crisis. However, there is no agreement of the EMU member countries that the ECB should do this. Although, there has been the urgent need of a lender of last resort for governments. The outcome of the unfinished and unclear fiscal integration in the EMU is that the ECB followed a kind of “muddling-through”. It helped governments of the crises countries to a certain extent (see the SMP), but it did not adopt complete responsibility as a lender of last resort. De Grauwe (2011) correctly argued that the sovereign debt crisis in the EMU would quickly be solved if the ECB would take on the role as a lender of last resort for all governments in the EMU. Of course, a supervisor would be needed to prevent moral hazard problems. Thus, the correct response in the EMU would be a deeper fiscal integration including a stronger fiscal centre controlling budget deficits in all member states, in addition to an ECB that also takes on the role of a lender of last resort for governments.

### 4.3 Big Bertha and TARGET2

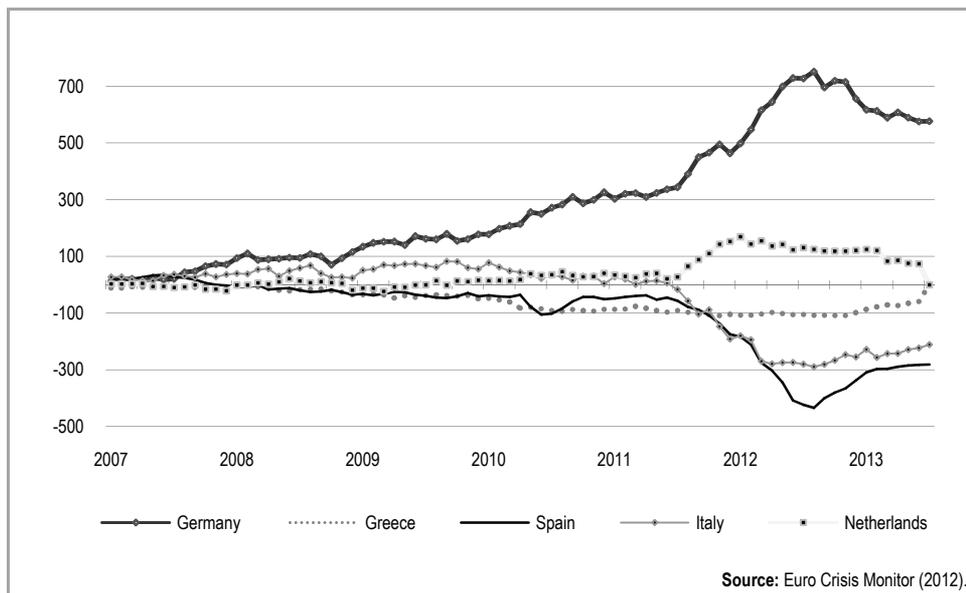
By the end of 2011, the ECB started a new long-term credit program for commercial banks in the Euro area, which was insensitively labelled as “Big Bertha” by Mario Draghi (ECB 2012a).<sup>13</sup> The program had a volume of €489 billion in December 2011 and €530 billion in February 2012 with the option of early repayment. Credits to commercial banks of more than 1 trillion Euros were granted for an interest rate of 1% and a maturity of 3 years. Additionally, minimum reserves requirements were cut substantially (see Figure 4). At the same time, the quality of collateral was further reduced (ECB 2012a). This huge long-term credit program increased the liquidity especially in EMU crises countries.

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<sup>12</sup> Section 13(3) of the Federal Reserve Act which was added in 1932 allowed the Federal Reserve to assume extra lending powers to individuals, partnerships, etc. in case of event of “unusual and exigent circumstances”. These extra powers enabled the Fed to lend not just to depository institutions during the crisis, but also to a broader category of agents. This includes also public households if needed. However, the Fed is very reluctant to lend to state or local governments. The Fed believes that, because this type of activity inherently involves political considerations, the Congress and the Administration are better suited to make decisions and take actions that would provide assistance to state and local governments (Fed 2012a).

<sup>13</sup> “Big Bertha” was used as a name for a big German siege gun from World War I.

Figure 5 below demonstrates that in the second half of 2011 the balance sheet of the ECB started to increase again. What happened? The EMU wrestled, as mentioned, with the sovereign financial crisis of several member countries and was heading towards a second recession within the next 5 years. It could not be excluded that some countries would leave the EMU or that the EMU would even collapse. These developments led to a further deterioration of the confidence of wealth owners (investment funds, rich private households, etc.) in crisis countries. As a consequence, wealth owners transferred large sums of monetary wealth within the EMU from Spain, Italy, Greece or Portugal to more stable countries, like Germany. In a monetary union such transfers are easy to organise. Deposits could simply be transferred without any exchange rate risk, for example, from a Spanish bank to a German bank. Transfers between EMU banks are carried out via the Trans-European Automated Real-Time Gross Settlement Express Transfer System (TARGET 2). In our example, the Spanish bank has to balance its financial obligation immediately vis-à-vis the German bank. As the Spanish bank does not get sufficient transfers from Germany and is also cut off from the EMU money market, the only possibility left is to acquire funds from the Spanish Central bank to pay the German commercial bank. The Spanish Central bank, as part of the ECB, finances the Spanish commercial bank by creating more Central bank money. This process eventually caused an explosion of TARGET2 imbalances shown in Figure 5 below. The biggest surplus countries are Germany, the Netherlands and Luxembourg, whereas the biggest deficit countries are Spain and Italy.



**Figure 5** Target 2 Net Balances for Selected EMU Countries in Billions Euro

In short, cash-flow imbalances within the EMU have not been financed by private capital flows. Instead, imbalances have been financed by increasing refinanc-

ing through the Central banks in crises countries (Ulrich Bindseil and Phillip J. König 2012). In substance, the ECB finances via TARGET 2 transfers the capital flight from EMU crises countries, and their current account deficits. If the ECB would not finance the banking systems in crises countries, the financial system would simply break down in the EMU. Until the end of 2012, around 1 trillion Euro Central bank money was created via the TARGET 2 channel, which accounts to one third of all Central bank money in the Euro area.

Financial institutions in the EMU also kept high excess reserves. However, compared to the USA, excess reserves developed in a more volatile manner (see Figure 4). Obviously, the ECB did not buy as large amounts of “bad” assets from financial institutions in problems as the Fed. The “Big Bertha” refinancing program, which was introduced to prevent the Euro area from dismantling, caused the dramatic increase of excess reserves in the EMU. Later, when the situation became more stable again, excess reserve holdings decreased sharply.

## 5. Conclusion

Bagehot (1873) already stressed the need of a lender of last resort. The meaning of a lender of last resort changes along the historical time axis. The fundamental changes in the financial systems since the start of the deregulation wave in the 1970s/1980s also modified the function of a lender of last resort. The Fed as well as the ECB took on the role as lender of last resort in a comprehensive way and prevented a collapse of the financial system. This is a fundamental difference to the Great Depression in the 1930s. Both Central banks cut interest rates, relaxed requirements for collateral and financed insolvent institutions. Insofar, their actions were successful. However, actions of both Central banks were shaped by political strategies of governments and policy decisions beyond the scope of monetary policy. One of these decisions was not only to save insolvent institutions but also to save the owners and (big) creditors of these institutions.

In the US, the lender of last resort function of the Fed was dominated by the need to stabilise a financial system with a big shadow sector, which is interwoven with the commercial banking system. To save commercial banks and the institutions in the shadow financial system, interventions by Central banks had to be extended to institutions other than commercial banks. Of course, it would have been possible to let the shadow financial system collapse and only save commercial banks and pension funds. However, this would have implied a decision to fundamentally change the structure of the financial system and reduce the role of the shadow financial system. It also would have meant to burden especially the rich with financial losses. Such a decision was not taken; neither in the US nor in Europe. Decisions about the structure of the financial system are made by the government and it is not the task of the Central bank. There is no doubt that the Fed was complete in line with US governments not to implement fundamental changes in the financial system.

The ECB did not struggle with a big shadow financial system comparable with the US. However, this did not make the ECB less important. It kept the Euro area together. Firstly, it contained the sovereign debt crisis with its SMP program, and then with its promise to finance (under certain conditions) public households in the

EMU without a limit. It was a big mistake that the ECB did not already give the promise to finance public households (under certain conditions) without a limit in 2010 when the sovereign debt crisis started. Especially Germany blocked such interventions. The price Europe paid for the failure of the ECB, to take on the role as a lender of last resort for governments early on, was high. And it is still an open question (at the end of 2013): To which extent the ECB will be politically allowed to stabilise public households in case the crisis intensifies again. The sovereign debt crisis reflects the insufficient integration in the EMU. The ECB cannot be the key institution to keep the Euro area together. More integration in the EMU is urgently needed. But the ECB would have had the possibility to stabilise public budgets in crisis countries. This would have avoided harsh austerity policies in the middle of a severe crisis and probably also would have prevented the lost decade many EMU countries are now experiencing.

Secondly, through financing huge TARGET 2 imbalances, the ECB prevented the collapse of crisis countries (not much understood by the public) and, to a certain extent, also saved the EMU banking system by simultaneously financing local governments.

In Europe as well as in the USA no steps were taken to seriously regulate the financial system and reduce the relevance of the shadow financial system. Especially the credit links between commercial banks and the shadow institutions have not been cut. The chance was missed to create a more stable financial system beyond cosmetic changes. But we should not blame Central banks for this. Which type of financial system should exist is a political decision beyond the scope of Central bank's monetary policy.

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