

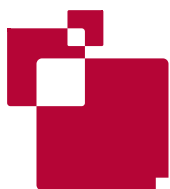
# PROPPING UP EUROPE?

JEAN PISANI-FERRY AND GUNTRAM B. WOLFF

## Highlights

- The Bank of England, the Federal Reserve (Fed) and the European Central Bank (ECB) have responded to the crisis with exceptional initiatives resulting in a major increase in their balance sheets. After the ECB's end-2011 launch of three-year bank refinancing (LTRO), there has been speculation that all three have *de facto* embarked on 'quantitative easing'.
- However, major differences remain: the Bank of England and Fed have mostly relied on large-scale purchases of government bonds, while the ECB has relied on lending to financial institutions with repurchase agreements of collateral (repos).
- The LTRO has successfully mitigated funding needs and reduced interbank stress, and has had a significant impact on sovereign bond yields in southern euro-area countries, and increased southern banks' government debt holdings, while northern banks have reduced sovereign exposure.
- The LTRO has had only weak effects on funding for households and non-financial corporations; credit dynamics remain weak particularly in the southern euro area.
- Underlying structural problems relating to banks, the macroeconomic adjustment and the euro area's governance need to be addressed before financial stability and economic growth can return. Monetary policy cannot fundamentally address these problems and is made less effective by economic/institutional heterogeneity.

This Policy Contribution is based on a briefing paper prepared for the European Parliament Economic and Monetary Affairs Committee's Monetary Dialogue of 25 April 2012. Copyright remains with the European Parliament. **Jean Pisani-Ferry** (jean.pisani-ferry@bruegel.org) is director of Bruegel. **Guntram Wolff** (guntram.wolff@bruegel.org) is deputy director of Bruegel. The authors are grateful to **Chiara Angeloni** and **Silvia Merler**, who prepared the Annex, for excellent research assistance.



# PROPPING UP EUROPE?

JEAN PISANI-FERRY AND GUNTRAM B. WOLFF, APRIL 2012

**THE SIZE AND THE NATURE** of the two recent European Central Bank repurchase agreements (repos), the longer-term refinancing operations (LTROs), call for an assessment of their effectiveness. The ECB stepped into a dysfunctional interbank market and provided large amounts of liquidity. The data show that this liquidity was taken up in particular by banks in countries under stress. At the same time, a large portion of the total liquidity increase was parked in the ECB's deposit facility; this appears to have been done in the main by northern European banks.

The ECB has replaced the interbank market between the north and the south of the euro area, thereby preventing a sudden stop of capital flows. The LTRO has also led to a decrease in the interest rates on government bonds in the southern countries, and the holdings of government securities have increased significantly in the southern countries' banking systems, while northern country banks have significantly reduced their holdings of government debt. In terms of the credit to the non-financial corporate and household sectors, no change in the subdued dynamics in southern Europe has so far been observed. This may relate to the low demand for credit because of the ongoing deleveraging in the corporate and household sectors. Interest rates for households and corporations have become more heterogeneous across the euro area and the LTRO has not yet reduced this heterogeneity. At the same time, nominal interest rates continue to be low in most southern euro-area countries.

The overall assessment of the LTRO is therefore mixed. It has stabilised financial conditions and the interbank market, but it has not fundamentally altered credit conditions in southern Europe. Monetary policy cannot solve the underlying structural problems in the banking system. It cannot provide the necessary structural reforms or overcome the shortcomings of the euro area's governance set-

up. Monetary policy is made difficult and less effective by the existing economic and institutional heterogeneity.

This Policy Contribution provides a detailed assessment of the effectiveness of the LTROs. We compare the different steps taken to address the crisis by the Bank of England, the Federal Reserve and the ECB, and consider if the three-year LTRO is having macroeconomic effects. Since 2009, the Bank of England and the Fed have mostly responded by purchasing government bonds. This quantitative easing has been done with the clearly stated aim of supporting the macroeconomy, as the traditional response of lowering the interest rate was constrained by the short-term interest rate's zero lower bound. The ECB has also relied on government bond purchases. These, however, have been much more limited and have been done with the stated aim of improving the monetary transmission mechanism, not with the aim of improving credit conditions. The ECB, instead, has relied more on its traditional monetary policy instruments, namely repos. Although the increase in the overall balance sheet size of all three central banks is by now similar in size, their composition therefore differs significantly.

## 1 WARDING OFF CRISIS

Since summer 2007, the US Federal Reserve, the Bank of England and the ECB have embarked on a series of extraordinary initiatives to ward off the global financial crisis and its repercussions. Statements by the respective central bankers, however, suggested that their aims were not aligned. Both Fed chairman Ben Bernanke and Bank of England governor Mervyn King indicated early on that, to borrow from Clausewitz, they regarded the new course of action as a continuation of interest rate policy by other means. Quantitative easing was intended to affect the yield curve in a situation in which its lower end had reached the zero bound,

and thereby to stimulate the economy despite the rigidity of the policy rate (Bernanke, 2009; King, 2009).

Jean-Claude Trichet, however, until the end of his tenure as ECB president, repeatedly indicated that the aim of the ECB's unconventional policy was not to substitute interest-rate cuts at the zero bound, but rather to ensure the proper transmission of interest-rate changes to the non-financial sector. According to the so-called separation principle adopted by the ECB, the goal of its non-standard measures was not to overcome the zero bound (and in fact, the policy rate was never brought to zero) but to substitute for an impaired interbank market, so that interest-rate policy impulses could be transmitted to the economy. The ECB went as far as emphasising that liquidity initiatives could conceptually be undertaken at any level of the policy rate. As indicated by Fahr *et al* (2011),

*“Quantitative easing can be seen as a substitute for conventional policy easing, to be exploited only once there is no more room for manoeuvre in policy interest rates [...]. The [ECB's] enhanced credit support programme was independent of the level of the MRO [main refinancing operation] rate: it could have been adopted, thus generating a large expansion of the ECB's balance sheet, at any interest rate level.”*

This difference in emphasis was consistent with the ECB's reluctance to embark on wholesale purchases of government bonds, as was done by the Fed and the Bank of England. Although the ECB in May 2010 also initiated the purchase of selected government bonds within the context of the Securities Market Programme (SMP), it did so only for limited amounts, with clear reluctance, and with the aim of improving the monetary policy transmission mechanism in countries where it was impaired by government bond market tension.

At the end of 2011, however, the ECB embarked on a large-scale provision of three-year liquidity to

the banking system. Both the size (almost €1 trillion gross) and the nature of this operation call for a re-examination of whether the distinction between the ECB and the Fed/Bank of England is still valid, or if the ECB has *de facto* joined the other two central banks and has since then conducted a large-scale unconventional monetary stimulus.

On the face of it, the three-year LTRO does not depart qualitatively from the ECB's prior actions. The ECB has provided wholesale liquidity to banks in a situation in which market indicators were again indicating mounting tensions on the interbank market. Far from increasing its purchases of government bonds, the ECB has since December 2011 been phasing out the SMP and reducing purchases. The magnitude of the operation, however, is such that it is difficult to maintain that it has not had significant macroeconomic effects.

## 2 CONCEPTUAL FRAMEWORK

Expressions used since the beginning of the crisis to characterise the central banks' extraordinary actions are confusing: 'unconventional policies', 'quantitative easing', 'qualitative easing', 'credit easing' are often used as if they were interchangeable, or at least little distinguishable.

Central bank actions can be categorised on the basis of three criteria:

- Whether they involve a departure from the open market operations routinely conducted by the central bank. This is a matter of *procedures* and the reference is past behaviour. According to this criterion a central bank's operation could be unconventional because it departs from standard practice, whereas the same operation might corresponds to standard practice for another standard bank and therefore not be unconventional. For example, the use of repos was unconventional for the Fed in 2008-09, but not for the ECB.
- Whether they involve intervention in particular market segments, eg credit markets or the

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*'At the end of 2011, the ECB embarked on a large-scale provision of liquidity to the banking system. The size and the nature of this operation call raise the question of whether the ECB has de facto conducted a large-scale unconventional monetary stimulus.'*

government bond market. This is a matter of *targeting* of the central bank intervention. However, intervention in a particular market segment can be motivated either by concerns specific to this segment or, in the case of intervention to affect the yield curve, by overall macroeconomic objectives. To be specific, the central bank can purchase government bonds to ease tensions in a particular market (as done by the ECB within the SMP framework) or to shape the yield curve and thereby affect growth;

- Whether they result in an increase in the central bank's balance sheet. This is a matter of *monetary impact*. However, whether or not there is an expansion of base money does not necessarily matter from the point of view of the non-financial sector. If the expansion of the monetary base was simply the counterpart of a drop in the monetary multiplier, there is no reason to consider that it has had an impact on the economy. For example, if the central bank substitutes for the interbank market to lend directly to banks, as done at the height of the 2008-09 stress, the expansion in the base money that takes place should have no impact beyond the banking system.

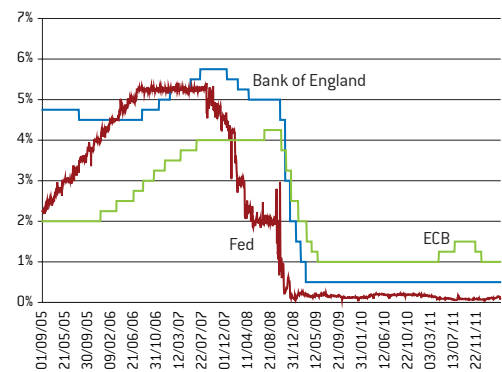
This short categorisation indicates that there is no straightforward way to characterise a central bank's policy. Especially, focusing on partial criteria (procedures; markets; or the evolution of base money) can be misleading because the same action can have both different motivations and different impacts. What really matters, and what in fact underlines the ECB's separation principle is whether extraordinary central bank initiatives address problems within the banking sector with the aim of ensuring its proper functioning and the proper transmission of interest rate decisions to the economy, or whether they aim at, and result in, changes in the financing conditions of non-financial agents, thereby amounting to monetary policy moves.

### 3 THREE POLICIES COMPARED

To compare the policies pursued by the three central banks, we start by looking at the policy rates throughout the crisis period (Figure 1). The timing and speed of the policy moves differs, the levels

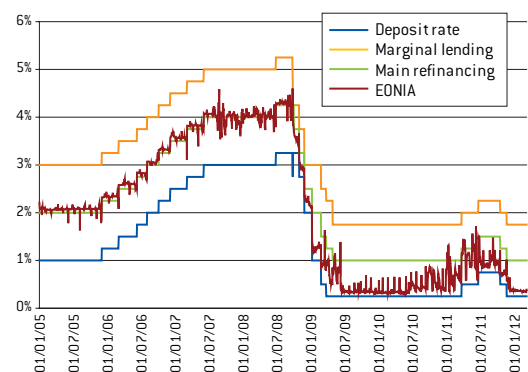
reached also differ, and the ECB was alone in attempting an early return to normality with its spring 2011 hikes. But on the whole the three central banks followed a broadly similar pattern of a sharp reduction in response to the deterioration of the financial situation. It should also be taken into account that although the ECB policy rate did not decline below 1 percent, the fixed-rate, full-allotment liquidity provision pushed the EONIA (the risk-free overnight rate) below 0.5 percent between summer 2009 and autumn 2010, and has done again since the beginning of 2012 (Figure 2).

Figure 1: Policy rates of the Fed, Bank of England and the ECB, 2005-12



Source: Bruegel based on Bank of England, ECB, Fed.

Figure 2: Euro-area interest rates, 2005-12



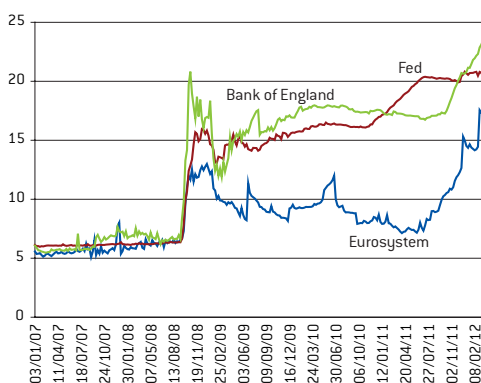
Source: Bruegel based on Bundesbank, ECB.

We next compare balance sheets. Here the comparison is made difficult by statistical discrepancies and the presence on the central banks' balance sheets of assets unrelated to monetary policy but whose valuation may fluctuate over time, suggesting policy actions that did not take

place. To make the comparison meaningful we first purged the balance sheet of gold, foreign exchange reserves and inherited assets that are not part of monetary operations (such as real estate and remaining loans to governments)<sup>1</sup>. The Annex gives the details. We also normalise by measuring balance sheets as a proportion of 2007 GDP.

All three central banks have experienced a dramatic increase in their assets and liabilities (Figure 3), and all three exhibit a similar pattern: massive expansion at the time of the Lehman shock in September 2008, followed by a stabilisation or partial reverse, and further expansion at a later stage (summer 2010 for the Fed and autumn 2011 for the Bank of England and the ECB). The differences are also noteworthy: first, the initial crisis response was more massive in the case of the Fed and the Bank of England compared to the ECB. Second, the ECB balance sheet (which exhibits spikes corresponding to the introduction or the termination of liquidity provision schemes) was on a downward trend until late spring 2011, by which point the initial expansion had been almost entirely reversed. Since then however its balance sheet has expanded dramatically and it has reached a level close to those reached by the other two central banks.

**Figure 3: Balance sheets of the Fed, Bank of England and the Eurosystem<sup>2</sup> in percentage of 2007 GDP, 2007-12**



Source: Bruegel based on Bank of England, ECB, Fed.

We next turn to the composition of the asset side of the balance sheet. In order to find out and compare what accounts for this expansion, and which instruments were used, we adopt a common

decomposition. We distinguish five categories:

- 1 Lending to financial institutions, mainly within the framework of repurchase agreements (repos);
- 2 Government securities held by the central banks within the framework of asset purchase programmes;
- 3 Non-government securities held within the framework of asset purchase programmes;
- 4 Foreign exchange swaps with other central banks (for the Fed)/foreign currency lending to domestic institutions (for the Bank of England and the ECB).
- 5 Other assets not elsewhere classified.

The first three categories correspond to the three main instruments used by central banks during the current crisis, and they correspond to the three sets of tools distinguished by Fed chairman Ben Bernanke in his presentation of the Federal Reserve's crisis response (Bernanke, 2009). The same instruments have to varying degrees also been used by the other two central banks.

The fourth category is intended to capture the effect of foreign exchange swaps entered into by the Fed and its partner central banks with the purpose of providing US dollar liquidity to European financial institutions.

The fifth category is a residual. For the Fed only, we include an additional category called 'Other operations' that includes significant programmes conducted during the financial crisis that are not easily classifiable as repos or securities purchases but that we want to differentiate from 'Other assets'.

The Annex gives the correspondence between our classification and those used by national central banks for the presentation of their balance sheets. Figures 4, 5 and 6 on the next page show the evolution of the composition of the central banks' balance sheets.

The breakdown of assets highlights significant differences in the policies of the Fed and the Bank of England on one hand, and the ECB on the other:

1. This type of comparison was advocated by ECB president Mario Draghi in the introductory statement to a press conference on 8 March, in which he said that "The Eurosystem has a very large volume of assets that have nothing to do with monetary policy, eg gold, foreign exchange reserves, among other things. If you compare the ECB's balance sheet with that of the Federal Reserve System or the Bank of England, the latter are very lean, they do not have the same volume of assets. You have to make the comparison in terms of the additional risks caused by the two LTROs. You have to compare the ratio of monetary policy instruments to GDP in the three different areas of the world".

2. The Eurosystem is the monetary authority of the euro area, comprising the European Central Bank and the central banks of countries using the euro.

Figure 4: Assets held by the Federal Reserve, 2007-12 (% GDP)

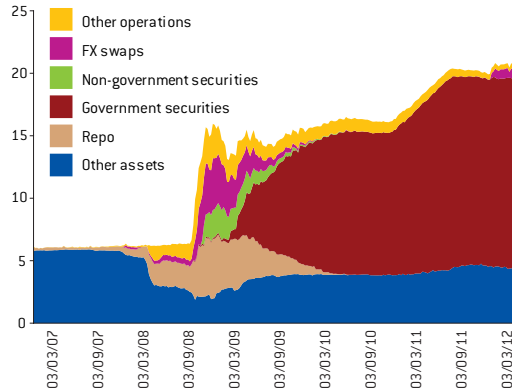


Figure 5: Assets held by the Bank of England, 2007-12 (% GDP)

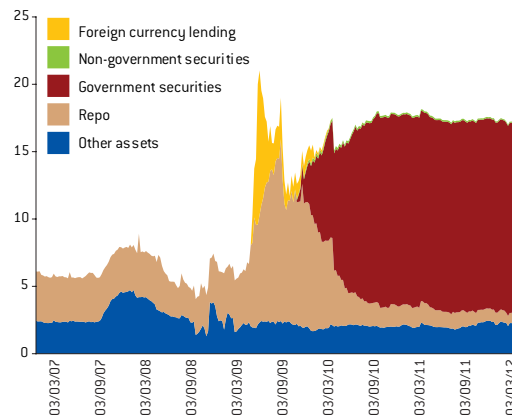
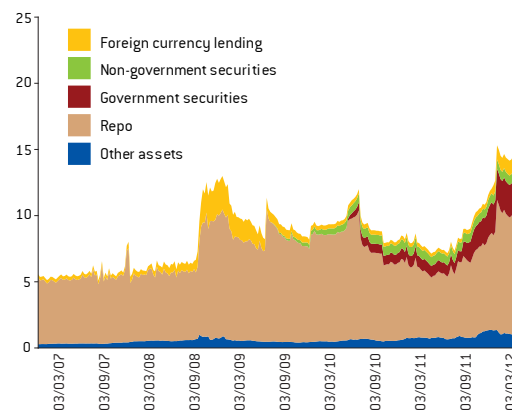


Figure 6: Assets held by the Eurosystem, 2007-12 (% GDP)



Source for Figure 4, 5 and 6: Bruegel based on Fed Cleveland and FRB Factors (reserves balances); Bank of England; ECB.

- In both the US and the UK, the surge of repo lending to financial institutions was short-lived. It took place in response to the disruption of the

interbank market following the Lehman shock and was unwound during 2009. By the beginning of 2010 it had either disappeared entirely (Fed) or been reduced to traditional proportions (Bank of England), and did not resume afterward. In the case of the ECB, however, there were repeated spikes of repo lending, with a resumption on a massive scale in December 2011;

- In the US and the UK, government bonds purchased within the framework of credit easing or quantitative easing programmes largely substituted repo operations from 2009 onwards. At the end of February 2012, these assets accounted for 103 percent of the increase in the overall size of the Fed balance sheet since February 2007, and 116 percent in the UK. In the euro area, however, the bulk of the increase took the form of repos operations. These accounted for 64 percent of the increase in the size of the balance sheet between February 2007 and February 2012, against 20 percent for government bonds.
- Other categories of assets represent a relatively minor part of all three balance sheets. Swaps and dollar liquidity provision represented a temporarily significant part only in 2008-09. Non-government securities were significant only for the Fed and only for a very short period.
- On the whole, what this comparison indicates is that by early 2012 all three central banks had increased the size of their balance sheets by roughly comparable amounts, but that the balance sheet compositions were entirely different. Purchases of government bonds accounted overwhelmingly for the increase in the US and the UK. Liquidity provision to the banking system accounted for the largest part of the increase in the euro area.

By itself this difference is however not necessarily indicative of a difference in the monetary stance. One interpretation of it is that at end-2011, the ECB faced severe dysfunction in the banking system and had no choice but to again stand in place of the clogged interbank market by providing large-scale liquidity support to banks. Another interpretation is that the provision of cheap, long-term liquidity to banks was a way to give them an incentive to resume lending to the

non-financial sector (including the government sector through bond purchases). By itself, the observation of the composition of the balance sheet cannot discriminate between these two interpretations. Finding out which is correct requires an assessment the impact of policy actions on non-financial agents.

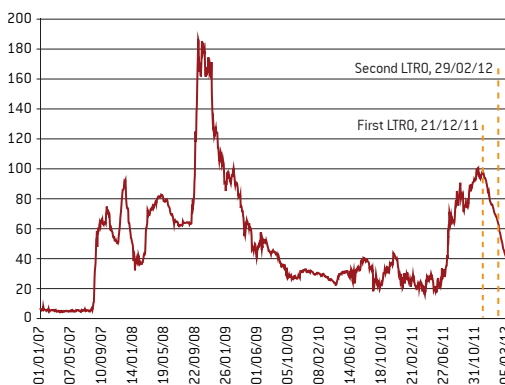
#### 4 ASSESSING THE IMPACT OF RECENT ECB ACTION

We now assess the impact of the ECB's actions. We start by describing the response in the interbank market; we then turn to the impact of the LTRO on banks' stock market performances, before discussing the impact on the real economy and on the government bond market.

##### 4.1 Interbank market

The ECB LTRO has had a dramatic impact on the interbank market. The Euribor/EONIA swap spread, which measures the difference between secured and unsecured overnight lending, is often used to assess the stress in interbank lending. Prior to the LTRO, it exceeded levels reached during the first phase of the global financial crisis, before the Lehman Brothers collapse. It has decreased massively since the start of the LTRO. Determined ECB action was thus arguably very important for calming the banking sector and reducing the risk of a major accident.

Figure 7: EURIBOR/EONIA swap spread

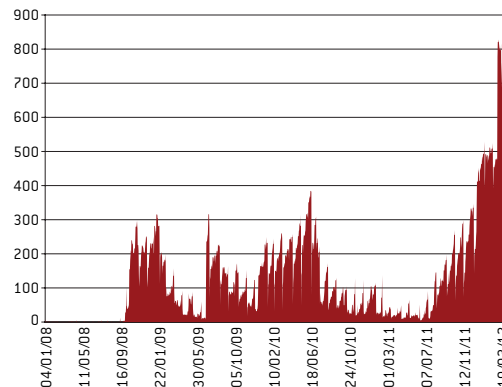


Source: Datastream.

At the same time, one should not mistake the reduction in the interbank stress indicator for an actual improvement in interbank relations. By lending massively to banks, the ECB has stepped

into the interbank market, substituting for it to a great extent. The use of the ECB deposit facility shows that banks park liquidity at the ECB in overnight deposits amounting to almost €800 billion and there is little evidence that this is changing.

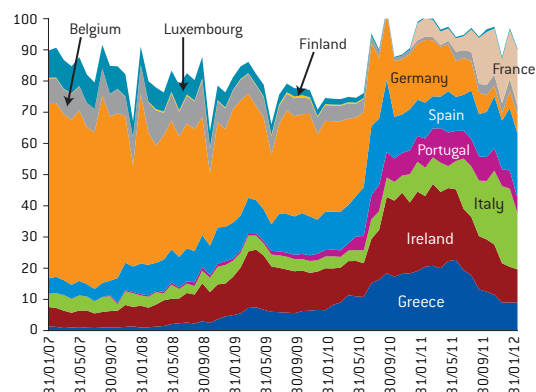
Figure 8: Use of the ECB deposit facility (€bns)



Source: ECB.

Effects have also been very asymmetric. The degree to which countries' have accessed ECB liquidity through repos has changed markedly during the last three years (see Figure 9). Prior to the more acute phases of the crisis, most liquidity was provided to banks located in Germany. Their share has declined dramatically while banks in countries in trouble have increasingly turned to the ECB liquidity. The ECB has thus stepped into a dysfunctional interbank market by increasingly providing funds to stressed banks in the euro-area periphery, thereby replacing the outflow of capital from private sources (see for example Merler and Pisani-Ferry, 2012b).

Figure 9: Share of Eurosystem refinancing operations by country (Jan 2007 - Nov 2011)



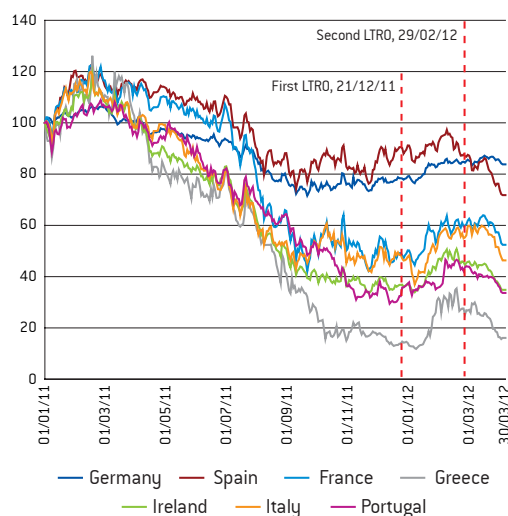
Source: National central banks and ECB. Note that Emergency Liquidity Assistance is not included.

#### 4.2 Impact on banks

The LTRO has at least temporarily solved the acute funding needs of euro-area banks by providing abundant liquidity at low rates with lower collateral standards. It has not, however, fundamentally altered the underlying problems of weak banks. One way of assessing this is to look at the stock market value of the banks. If the LTRO has increased the solvency of banks, their stock prices should have increased too. In principle, the low-cost three-year loans offered by the ECB should be seen by market operators as helpful for restoring the soundness of the banking system and thereby boosting bank stocks.

Angeloni and Wolff (2012) look at the normalised average bank stock-market index (consisting of the banks located in a given country) since January 2011. The sample consists of those banks stress-tested in the European Banking Authority's (EBA) recent stress tests. A clear pattern of the effects of the ECB's LTRO cannot be discerned. Shares have continued to move sideways since October and seem unaffected by the ECB's operations. This result suggests that the ECB helped ensure the funding of banks but did not address bank solvency concerns. ECB action has contributed to the financial system's stability, but has not helped bank shareholders.

Figure 10: Banks' stock market price indexes



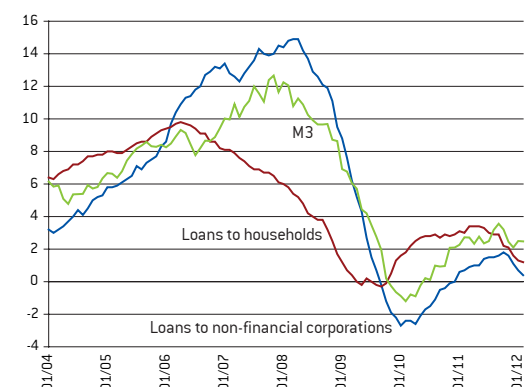
Source: Datastream. Note: Stock market index normalised to 100 for January 2011.

#### 4.3 Pass-through to the real economy

The LTRO has clearly helped to improve the funding conditions of banks. At the same time, the huge increase in the deposit facility suggests that banks still hoard a lot of liquidity at the ECB, even though this means incurring losses for the banking system as a whole (liquidity received through the LTRO costs 1 percent while the deposit facility only offers 0.25 percent). Confidence has therefore not yet returned to the euro-area banking market. Is there any evidence that the LTRO has led to an expansion of credit growth to the euro-area corporate and household sectors?

Growth of credit to non-financial corporations and to households continues to be very weak and is falling in the euro area as a whole (Figure 11). Figure 11 does not suggest that there is yet a change in the downward credit trend, with annual credit growth in February 2012 at 0.4 percent for the non-financial corporate sector and 1.2 percent for households. At the same time, the money supply (M3) trend seems to have decoupled to some extent from credit trends. One explanation for this is that an additional counterpart to M3 on the asset side, besides credit to the private sector, is credit to governments and purchases of government bonds. We look into this below.

Figure 11: Loans to non-financial corporations and households vs. M3 annual growth rate (%)



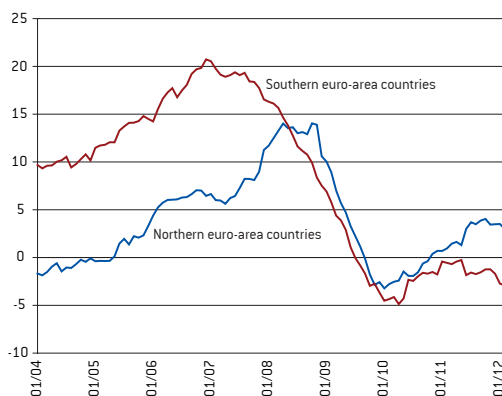
Source: ECB.

The aggregate numbers conceal substantial heterogeneity across euro-area countries. Figures 12 and 13 show the growth rate of loans to non-financial corporations in selected euro-area countries. The figures document the steep decline in credit



growth in the countries that had a huge credit boom before the crisis. It is also very clearly visible that credit growth rebalanced during 2007-08, with countries such as Germany, which for a long time exhibited subdued credit growth, experiencing a significant pick-up in credit.

**Figure 12: Bank loans to non-financial corporations, annual growth rate (%)<sup>3</sup>**



Source: Bruegel based on ECB.

Credit growth recovered after mid-2010 in northern euro-area countries, including France, while credit growth in southern countries and Ireland remains subdued. The data do not provide evidence that the LTRO has changed these underlying credit dynamics. Growth of credit to non-financial corporations in Greece, Ireland, Portugal and Spain remains negative, while in Italy it approaches negative territory.

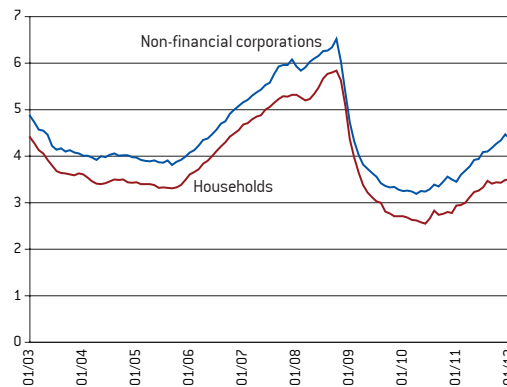
The data do not, however, allow us to conclude that credit growth has been impaired by the lack of central-bank liquidity. Rather, the data may reflect weak demand for credit, ie the ongoing deleveraging in the corporate and household sectors, and credit rationing by weak banking systems. In this case the response should go beyond providing abundant liquidity and should address more structural weaknesses. This may include more forceful recapitalisation plans and other [euro-area] measures to restore confidence in the banking systems.

Interest rates fell dramatically in the euro area for the corporate and household sectors following the Lehman Brothers bankruptcy. During 2011, interest rates gradually increased and only since December 2011 have interest rates on loans to

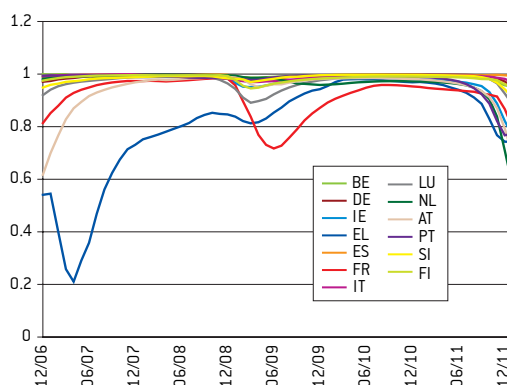
corporations fallen again. The LTRO has thus helped to improve aggregate interest-rate conditions in the euro area.

A significant dispersion of interest rates can be observed within the euro area. In Figure 14, we show the correlation between interest rates for loans to households for the purchase of homes in a specific country, and the euro-area rate. As can be seen, the correlation has reduced markedly, suggesting that interest-rate conditions across the euro area have become more heterogenous. For the early part of the sample, some countries, in particular Greece, had a lower level of interest-rate integration. This may be explained by regulatory and other factors. For the interest rates for the corporate sector, we observe a high degree of integration, which reduced very significantly recently [see Figure 15].

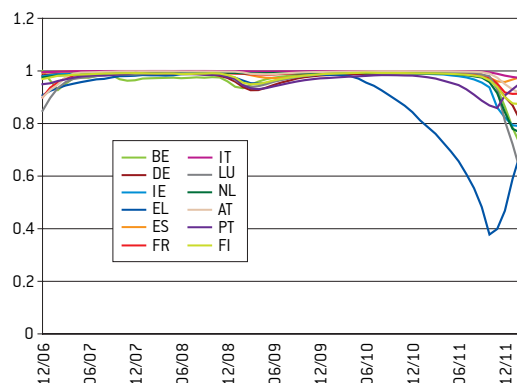
**Figure 13: Euro area, banks' interest rates on loans to non-financial corporations and households (%)**



**Figure 14: Financial integration of loans for house purchases**



3. Northern euro area = Austria, Belgium, Finland, France, Germany, the Netherlands; southern euro area: Greece, Ireland, Italy, Portugal and Spain.

**Figure 15: Financial integration of corporate credit loans**

Source for Figures 13, 14 and 15: Bruegel based on ECB, MFI interest rates. Note to Figure 13: Loans to non-financial corporations up to €1 million at floating rate and up to 1 year initial fixed rate; loans to households for house purchase at floating rate up to 1 year initial fixed rate. Note to Figure 14: 2-year backward-moving correlation coefficient of interest rates for house purchase at floating rate and up to 1 year initial rate fixed [series code 1.2.1.5.] to the euro-area rate. Note to Figure 15: 2-year backward-looking moving correlation coefficient. Loans up to €1 million at floating rate and up to 1 year initial rate fixed [series code 1.2.2.8.] to the euro-area rate.

At the same time, however, interest rate levels remain favourable in a number of countries in which one would suspect that problems exist (see Table 1). In Ireland, for example, it is cheaper to get a mortgage than in Germany. For mortgages, credit conditions therefore seem to be still reasonable across the euro area.

This contrasts with credit interest rate conditions for corporations (Table 1, lower panel). While they have improved in most euro-area countries, compared to the pre-crisis level of June 2007, in Greece and Portugal they have clearly deteriorated. Also the relative ranking of interest rates has markedly changed with interest rates in Belgium, France and Germany now being among the lowest, while interest rates in Spain – once more favourable than in France – have now become clearly less favourable.

#### 4.4 Government bond markets

The LTRO had a very strong and significant effect on interest-rate conditions in the euro-area government-bond market. The yield curves have come down on average by more than 1 percentage point at the short end and a bit less than 1 percentage point at the long end. The LTRO has also clearly helped to reduce the abnormal shape of the yield curve at the short end where yields were very high. At country level, Bate and Boone (2012) show that the yield curves for Spanish and Italian government bonds have been affected, especially at the short-end.

The impact on the yield curve has been less pronounced for the government bonds of AAA countries (see Figure 17). In particular at the short-end, the decrease is less than 0.2 percentage points, and the shape of the yield curve was well behaved before the LTRO. The yield curve data

**Table 1: Banks' loan interest rates**

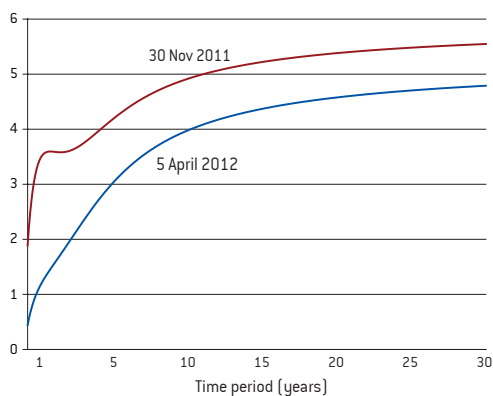
Loans to households for house purchases, at floating rate and up to 1 year initial fixed rate												
	EA	BE	DE	IE	GR	ES	FR	IT	NL	AT	PT	FI
June 2007	5	4.87	5.64	4.95	4.9	5.01	4.37	5.18	5.01	5.19	4.7	4.73
Jan 2009	4.37	4.36	4.97	3.72	4.55	4.8	5.23	4.34	4.74	5.01	4.12	3.18
Dec 2010	2.78	3.12	3.38	3.01	3.65	2.52	3.06	2.52	3.58	2.75	2.96	2.08
Nov 2011	3.43	3.81	3.74	3.12	4.48	3.48	3.64	3.33	4.04	3.1	4.33	2.53
Feb 2012	3.44	3.86	3.55	3.09	3.77	3.54	3.71	3.99	4.01	3.06	4.38	2.27

Loans to non-financial corporations, up to €1 million at floating rate and up to 1 year initial fixed rate												
	EA	BE	DE	IE	GR	ES	FR	IT	NL	AT	PT	FI
June 2007	5.53	5.52	6.09	6.19	6.48	5.33	5.39	5.42	5.08	5.1	6.92	5.35
Jan 2009	4.73	4.08	4.55	5.26	5.45	4.93	4.36	4.59	4.31	4.01	7.12	3.71
Dec 2010	3.5	2.63	3.77	3.87	6.34	3.78	2.65	3.18	3.47	2.55	5.92	2.86
Nov 2011	4.34	2.89	3.92	5.29	7.18	4.91	3.2	4.58	3.6	2.93	7.56	3.26
Feb 2012	4.28	2.38	3.56	4.72	7.02	4.96	3.04	4.92	3.3	2.67	7.54	3.21

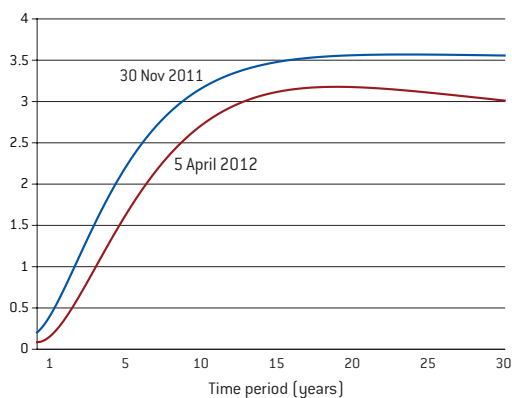
therefore indicates that the LTRO has had a particularly strong effect on the government-bond yields of countries with lower credit ratings. Some of the liquidity in the banking system thus appears to have been used to buy more of the government bonds of weaker euro-area economies than of the stronger euro-area economies. The decrease in spreads could thus be a result of this.

**Figure 16: Euro-area yield curve for government bonds (all issuers)**



Source: ECB.

**Figure 17: Euro-area yield curve for government bonds (% , AAA issuers only)**



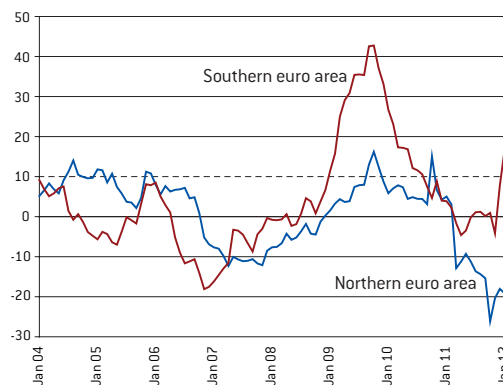
Source: ECB.

An alternative possibility is, however, that the LTRO has allowed credit conditions in the banking system to stabilise, thereby increasing financial stability and the proper functioning of monetary policy. These better stability prospects may have led to a reversal in sentiment, thereby reducing interest rates in the periphery bond markets by more than in the AAA countries.

To distinguish between these two possibilities, we

look into government bond purchases by monetary and financial institutions (MFIs) in euro-area countries. The ECB provides statistics on purchases by MFIs in different countries of government securities issued by euro-area governments. Unfortunately, the statistics do not differentiate between issuers of government securities. The European Banking Authority stress tests and other prior experience, however, show that banks tend to exhibit a significant home bias in their purchases and holdings of government bonds. It therefore can likely be assumed that more purchases of government securities by Spanish banks and fewer purchases by German banks, mean that more Spanish bonds than German bonds have been bought, especially as other data indicate that purchases by non-residents have decreased in weaker countries (Merler and Pisani-Ferry, 2012a).

**Figure 18: Bank holdings of euro-area general government securities, annual growth rate (%)**



Source: Bruegel based on ECB, MFI balance sheets. Note: northern euro area = Austria, Belgium, Finland, France, Germany, the Netherlands; southern euro area: Greece, Ireland, Italy, Portugal and Spain.

For the euro area as a whole, holdings of government securities by euro-area banks have increased since the end of November 2011, from €1382 billion to €1497 billion, ie by about 8 per cent. The aggregate figure conceals significant heterogeneity. Figure 18 illustrates this by showing significantly different behaviour of banks in their purchases of government securities across different countries. At the peak of the crisis in 2009, government bond holdings of southern euro-area banks increased dramatically, probably reflecting the lack of demand for funds by the private sector and the government sector's strong

fiscal expansion. The LTRO led again to a dramatic increase in the buying of government bonds, which is not visible in northern euro-area countries. The government bond holdings of Italian, Portuguese and Spanish banks have in particular increased, by €54 billion, €4 billion and €68 billion respectively.

Overall, the data suggests that the greatest part of the additional ECB liquidity ended up in the deposit facility of the ECB itself. The interbank market remains stressed but banks' acute funding needs have been addressed by the LTRO, and the LTRO was therefore of crucial importance for the preservation of financial stability. Significant amounts of the LTRO were used to buy government securities, leading to a decline in spreads and yields, and this has also helped to increase financial stability, even though we have shown that the LTRO has not improved the solvency conditions of banks. Relatively little evidence can be found that the LTRO improved actual credit flows to households and corporations in countries under financial stress. This suggests that banks, households and corporations do not primarily have a liquidity problem. Instead, the major deleveraging that is required for the reduction of the debt overhang in households and corporations may be one of the principal factors behind weak credit dynamics [Ahearne and Wolff, 2012]. Furthermore, lack of confidence in the overall construction of Economic and Monetary Union impairs credit in the weaker EMU countries [Merler and Pisani-Ferry, 2012b].

## 5 CONCLUSIONS

The ECB has, with the recent LTROs, managed a massive expansion of its balance sheet. This has been called the euro-area equivalent of quantitative easing, as done by the Fed and the Bank of England. Large portions of this liquidity, however, are parked in overnight deposits at the ECB, reducing its effectiveness for the overall monetary policy stance.

The main obstacle for the ECB is not the fact that the Treaty on which it is based places tight limits on the purchase of government bonds, compared to those existing in the UK and the US. Rather, the absence of a banking and fiscal union and the strong heterogeneity within the euro area reduces the effectiveness of the instruments the ECB has. The absence of a common euro-area reference asset precludes the ECB from exercising a direct influence over the benchmark yield curve. The combination of sovereign and banking fragility, in turn, means that additional liquidity provided to the banks in the euro area will be used to smooth the effect of the exit of private funding and the selective buying of government bonds by banks, which in turn increases fragility.

The three-year LTRO has been an appropriate response to a situation of extreme stress among European financial institutions. As long as the crisis of confidence continues, however, there are inherent limits to the LTRO's effectiveness. Additional ECB liquidity will not improve credit conditions in countries under stress. ECB policy is rendered less effective by the heterogeneity across countries and the incomplete fiscal set-up. The ECB therefore rightly calls for a stronger fiscal union.

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**ANNEX**

The ECB, the Fed and the Bank of England conduct monetary policy in different ways and pursued different policies to deal with the crisis. To compare them, we reclassified the items presented in the balance sheet into six macro-categories:

- Repos: including lending to financial institutions
- Purchase of government securities
- Purchase of non-government securities
- Foreign exchange swaps/foreign currency lending to banks
- Other assets
- Other operations, including those new schemes adopted that cannot be easily classified in another category

Source: Bank of England		BANK OF ENGLAND	
<i>ITEM IN BALANCE SHEET</i>	<i>DESCRIPTION</i>	<i>CLASSIFICATION</i>	
<b>Short term open market operations</b>	Composed by: one-week repos, fine-tuning repos and repos at other maturity within maintenance period	<b>Repo</b>	
<b>Longer-term sterling repo</b>		<b>Repo</b>	
<b>Ways and Means advances to HM Government</b>		<b>Other assets</b>	
<b>Bonds and other securities acquired via market transactions</b>	Includes the small foreign exchange reserves that the Bank of England holds in support of its monetary policy objective. These are not the UK's official holdings of international reserves, which are almost entirely held in a government account administered by Her Majesty's Treasury (the Exchange Equalisation Account – EEA). The Bank acts as HMT's agent in the day-to-day management of the EEA, but the EEA is not on the Bank's balance sheet. We cannot exclude this item from the balance sheet because: (i) it is included into the assets related to monetary policy and (ii) reserves are not the only component of it.	<b>Other assets</b>	
<b>Other assets</b>	Other Assets includes the government and non-government securities purchased by the Bank of England as well as the USD swaps conducted in agreement with other central banks. The three components have been disaggregated and showed separately. The rest is included in 'other assets' as residual.	<b>Government securities</b> <b>Non-government securities</b> <b>Lending in foreign currency</b> <b>Other assets</b>	

Source: ECB		
EUROPEAN CENTRAL BANK (ECB)		
<u>ITEM IN BALANCE SHEET</u>	<u>DESCRIPTION</u>	<u>CLASSIFICATION</u>
<b>Main refinancing Operations (MRO)</b>	Regular liquidity-providing open market operation executed by the Eurosystem in the form of reverse transactions. Main refinancing operations are conducted through weekly standard tenders in the form of reverse transactions and normally have a maturity of one week.	<b>Repo</b>
<b>Longer-term refinancing operations (LTRO)</b>	Liquidity providing reverse transactions with a monthly frequency and a maturity of normally three months.	<b>Repo</b>
<b>Marginal Lending Facility</b>	is a standing facility of the Eurosystem which counterparties may use to obtain overnight liquidity from a national central bank at a pre-specified interest rate against eligible assets.	<b>Repo</b>
<b>Fine-tuning</b>	Are open-market operations executed on ad-hoc basis with the aim of managing the liquidity situation in the market and steering interest rates, in particular in order to smooth the effects on interest rates caused by unexpected liquidity fluctuations in the market. They are included by the ECB in the category of lending to EA credit institutions related to monetary policy (item is insignificant)	<b>Repo</b>
<b>Securities held for monetary purposes</b>	The item is composed by the government bonds purchased under the Securities Market Programme (SMP) and non-government securities purchased under the Covered Bond Purchase Programme (CBPP). We disaggregate them and present them separately.	<b>Government securities Non-government securities</b>
<b>Claims on euro area residents denominated in foreign currency</b>	It is related to the USD liquidity line set up with the FED. The liquidity provided under this temporary arrangement is identified in the ECB annual report on the liability side ('Liabilities to non-euro residents denominated in euro'). On the asset side, the item that matches it is 'Claims on EA residents in foreign currency'. It is not included by the ECB in the items related to monetary policy, but we include it as it is the asset counterpart of the USD swaps. Given that it does not include only USD liquidity swaps (before 2008), we include it as lending to EA institutions in foreign currency.	<b>Lending in foreign currency</b>
<b>Credit related to margin call</b>	The ECB includes it into the asset related to monetary policy, under lending to financial institutions but it cannot be considered a REPO, so we include it under 'Other assets' (the item is however insignificant).	<b>Other assets</b>
<b>Other claims on euro area credit institutions denominated in euro</b>	In 2010 the Governing Council decided that the euro-area central banks would make available for lending bonds bought under the covered bond purchase programme. The ECB implemented these lending operations through matched repurchase transactions, whereby amounts received under repurchase agreements are fully and simultaneously reinvested with the same counterparty under a reverse repurchase agreement which is actually recorded under this 'Other claims on euro area credit institutions denominated in euro'. The ECB does not include it in assets related to monetary policy but being connected to the CBPP we include it as 'Other assets'.	<b>Other assets</b>
<b>Claims on non-euro area residents denominated in euro</b>	As at 31 December 2010 this item consisted of a claim on a non-euro area central bank in connection with an agreement on repurchase transactions established with the ECB. Under this agreement the non-euro area central bank can borrow euro against eligible collateral in order to support its domestic liquidity-providing operations. It is not included by ECB in the assets related to monetary policy and it does not concern the EA, we therefore exclude it.	<b>Other assets</b>
<b>General Government debt denominated in euro</b>	Outstanding non-marketable claims on euro area governments stemming from before 1 January 1994, from which date onwards Eurosystem NCBs were no longer allowed to provide credit facilities to governments or make direct purchases of debt instruments from governments. This debt will be redeemed by governments in due course.	<b>Being a residual from pre-1994 and not related to monetary policy, it has been excluded</b>
<b>Claims on non-euro area residents denominated in foreign currency</b>	Represents the main FX reserves of the ECB. It is composed by: (i) receivables from the IMF and (ii) balances with banks and securities investments, external loans and other external assets (foreign currency assets other than gold and SDR holdings with non-euro area residents).	<b>Excluded</b>
<b>Gold</b>		<b>Excluded</b>
<b>Other Assets</b>	Collective item that includes items in the course of settlement, coins of the euro area if an NCB is not the legal issuer, tangible and intangible fixed assets and other financial assets. Other financial assets comprises participating interests and investments in subsidiaries; equities held for strategic/policy reasons, securities, including equities, and other financial instruments and balances (e.g. fixed-term deposits and current accounts), held as an earmarked portfolio: reverse repo transactions with credit institutions in connection with the management of securities portfolios. This item also contains revaluation differences arising on off-balance-sheet instruments and accruals and prepaid expenditure.	<b>Excluded</b>
<b>Securities other than those held for monetary purposes</b>	Recorded at market value, they present considerable valuation effects	<b>Excluded</b>

Source: FED Cleveland		FEDERAL RESERVE (FED)
<u>ITEM IN BALANCE SHEET</u>	<u>DESCRIPTION</u>	<u>CLASSIFICATION</u>
REPO	Repurchase agreements reflect some of the Federal Reserve's temporary open market operations.	Repo
Credit to depository institutions	Traditionally, the Fed has provided healthy banks with short-term credit through short-term loans at its <b>discount window-most typically over one business day</b> . Such loans are usually <b>secured with very high-quality collateral</b> .	Repo
Term-auction credit (TAF)	To overcome the stigma problem of the Federal Reserve's Discount Window, the Fed unveiled the Term Auction Facility (TAF) in December 2007. The TAF <b>auctions funds to depository institutions against the same kinds of collateral that can be used to secure funds at the discount window</b> . But because healthy banks are just as likely to participate in the auction as those in trouble, individual banks are not assumed to be under distress just because they use the facility.	Repo
Currency Swaps	At the same time it introduced the TAF, the Federal Reserve announced it would extend currency swap lines with the European Central Bank and the Swiss National Bank. The swap lines provide these central banks with dollars, which they can use to supply liquidity to credit markets in their jurisdictions that are based on dollars.	FX swaps
Credit extensions (PDCF)	To deal with the shortage of collateral, the Federal Reserve introduced the <b>Primary Dealer Credit Facility (PDCF)</b> . The FED's discount window is reserved to depository institutions: the PDCF authorised the Federal Reserve Bank of New York to create a similar lending facility for primary dealers (mostly investment banks). In effect, <b>it created a temporary 'discount window' for some of the largest non-depository institutions, collateralised by a broad range of investment-grade debt securities</b> . Even if it is an extraordinary operation, we consider it to be comparable with the discount window and therefore include it in Repo.	Repo
Long Term treasury purchases		Purchase of government securities
Mortgage-backed securities	To help reduce the cost and increase the availability of credit for the purchase of houses, on November 25, 2008, the Federal Reserve announced that it would buy MBS guaranteed by the Government Sponsored Enterprises Fannie Mae, Freddie Mac, and Ginnie Mae. Given that these agencies are Government Sponsored Enterprises, we include this into 'Purchases of government securities'. Source: Federal Reserve System Monthly Report on Credit and Liquidity Programs and the Balance Sheet, December 2009.	Purchase of government securities
Federal Agency debt securities	These represent the purchase of direct obligations of Fannie Mae, Freddie Mac, and the Federal Home Loan Banks. Again, we include them in 'Purchases of government bonds'.	Purchase of government securities
Commercial Paper Funding Facility	It was introduced to support the commercial paper market. Commercial paper is short-term (overnight to 270-day maturity) debt issued by corporations, often to manage cash needs in the short run, such as payroll obligations. It is most often unsecured, but in before the crisis many financial institutions secured their paper (called 'asset-backed commercial paper') with their holdings of long-term assets, most notably mortgage-backed bonds. Uncertain credit markets in the fall of 2008 led to concerns that companies that had issued unsecured paper or asset-backed commercial paper would be unable to roll it over into new debt. At the time the CPFF was announced, the market would only allow paper to be rolled over one night and at very high interest rates. The CPFF is intended to alleviate the rollover risk. <b>The facility purchases three-month unsecured and asset-backed commercial paper carrying credit ratings in the top tier.</b>	Purchase of government securities
Traditional securities holdings	Represents the stock of securities traditionally held by Federal Reserve Banks in connection with its open market operations (conducted via outright purchases or sales of securities).	Other assets
Other FED Assets		Other assets
Securities Lent to dealers (TSLF)	The TSLF is a 28-day facility that will offer Treasury to the Federal Reserve's primary dealers in exchange for other program-eligible collateral. Intended to promote liquidity in the financing markets for Treasury and other collateral and thus to foster the functioning of financial markets more generally. <b>It is not directly cash in exchange for a security, but rather a liquid security in exchange for a less liquid security. Idea is to deal with shortage of collateral.</b> Therefore we cannot classify it as a repo and include it in 'Other Operations'. (Note: In the US primary dealers are those bank, broker/dealer or other financial institution that are able to trade directly with the U.S. Federal Reserve (eg underwriting new government debt). These dealers must meet certain liquidity and quality requirements.)	Other operations
Credit Extension (AIG)	Under section 13(3) of the Federal Reserve Act, the Federal Reserve was able to <b>extend loans directly to a distressed financial institution</b> , namely AIG. The loan is <b>collateralised by all of AIG's assets</b> , and the U.S. government received a 77.9 percent equity interest in AIG.	Other operations



<b>Asset-backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF)</b>	<p>Introduced to help MMMFs that held asset-backed commercial paper (ABCP) meet investors' demands for redemptions, and to foster liquidity in the ABCP market and money market more generally.</p> <p>Under the programme, the Federal Reserve provided loans to a number of financial institutions. These institutions used the funding to purchase eligible ABCP from MMMFs. Borrowers under the AMLF, therefore, served as conduits in providing liquidity to MMMFs, and the MMMFs were the primary beneficiaries of the AMLF. AMLF loans were fully collateralized by the ABCP purchased by the AMLF borrower.</p>	<b>Other operations</b>
<b>Term Asset backed securities (TALF)</b>	<p>The program provides both liquidity and capital to the consumer and small business loan asset-backed securities markets. The Fed lent money against asset-backed securities that were backed by student, auto, credit card, and SBA loans. The Treasury Department provided \$100 billion in credit protection from its Troubled Asset Relief Program (TARP) to the TALF-a cushion against losses on the ABS collateral.</p>	<b>Other operations</b>
<b>Maiden Lane 1/2/3</b>	<p>The Maiden Lane LLCs are <b>tied to pools of assets that the Fed has lent against to stabilise specific companies and asset classes.</b></p> <p><b>Maiden Lane 1</b> The Maiden Lane LLC consisted of a <b>loan to J.P. Morgan backed by a pool of securities that were obtained from the acquisition of Bear Stearns in March 2008.</b> The pool consisted primarily of investment-grade residential and commercial mortgage-backed securities.</p> <p><b>Maiden Lane 2</b> Maiden Lane II purpose traces back to AIG. Federal Reserve extended a <b>loan to AIG to meet cash redemptions and stabilise the value of the mortgage-backed securities. The loan collateral (mortgage bonds) is represented in the Maiden Lane II vehicle.</b></p> <p><b>Maiden Lane 3</b> Maiden Lane III was created after billions were loaned to AIG. The insurer had extended credit protection-in the form of credit default swaps-on billions of dollars' worth of collateralized debt obligations (CDOs). When AIG's credit rating was downgraded, the credit default swap holders ordered collateral postings at levels that threatened the company's solvency. Beginning in late November 2008, <b>the Fed loaned funds to Maiden Lane III so that it could begin to purchase the CDOs upon which the credit default swap contracts had been written (the CDOs also serve as collateral for the Fed loan).</b></p>	