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Central Bank Measures in Support of the Financial Sector in the EU and the United States

The extensive public sector measures in support of the financial sector have been key to managing the financial crisis that erupted in mid-2007 and intensified after the bankruptcy of Lehman Brothers. This article looks into the measures taken by central banks to contain the impact of the crisis. This article reviews and compares the measures adopted by the Eurosystem, the Bank of England (BoE) and the Federal Reserve System (Fed). A complementary article, to appear in a subsequent issue, will deal with governments' responses to the crisis.

Early on in the crisis that erupted in mid-2007 and intensified after the bankruptcy of Lehman Brothers, it became clear that the provision of central bank liquidity was paramount to support banks when liquidity in the market dried up. A primary reason for the freeze in the money market was a lack of confidence, owing to the uncertainty regarding banks' exposure to subprime assets and structured products, and the perceived rise in counterparty risk.[1] As a reflection of this lack of confidence, the spreads between the three-month deposit and overnight swap rates, which were already at elevated levels, soared during September 2008.[2]

Central banks had already lowered their policy rates as the substantial and rapid deterioration in the financial market conditions and the macroeconomic environment had changed the outlook for price stability, with inflation risks declining and deflation risks emerging both in the euro area and globally. In response to the intensification of the crisis, central banks additionally adopted various measures to enhance liquidity provision to banks, which can broadly be divided into traditional and nonstandard categories.[3] At the onset of the crisis, the measures adopted consisted of traditional market operations, outside the regular schedule or of larger amounts, to keep short-term money-market rates close to policy rates.[4]

When these measures proved insufficient to reduce funding pressures and the widening spread between overnight and term interbank lending rates, central banks implemented changes to their operational framework. These changes included, *inter alia*, more frequent auctions, an expansion of the volume of lending facilities, longer-term financing, changes in the auctioning process, a broadening of the range of accepted collateral, outright asset purchases and the setting up of liquidity facilities for intermediaries other than banks.[5]

In addition, the large central banks coordinated some of their actions.[6] This cooperation was reflected in the joint announcement that they would provide term funding and enter into temporary swap agreements to obtain foreign currency liquidity, which they passed on to the finan-

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1 Committee on the Global Financial System: Central Bank Responses to the Financial Turmoil, CGFS Papers No. 31, July 2008.

2 European Central Bank: Financial Stability Review, December 2008.

3 The distinction between standard and non-standard measures varies across central banks owing to different traditions, frameworks and financial system structures.

4 Committee on the Global Financial System: Central Bank Responses to the Financial Turmoil, CGFS Papers No. 31, July 2008. For example, the ECB started to conduct supplementary liquidity-providing longer-term refinancing operations on 12 September 2007 with the objective of supporting the normalisation of the euro money market. See http://www.ecb.int/press/pr/date/2007/html/pr070906_1.en.html.

5 The ECB widened its pool of eligible collateral to include marketable and non-marketable securities with a rating of at least "BBB-" but applied additional credit-risk haircuts to debt securities with a rating below "A-". See http://www.ecb.europa.eu/ecb/legal/pdf/l_31420081125en00140015.pdf.

6 Since the coordinated actions taken in December 2007, the G-10 central banks have continued to work together closely and to consult regularly on liquidity pressures in funding markets.

cial sector.[7] In the following sections, the non-standard measures taken by the Eurosystem, the Federal Reserve System and the Bank of England are discussed in more detail.

This article provides a systematic overview of the measures that have been adopted by the Eurosystem in the euro area in support of their financial systems and compares them to those adopted by the Bank of England in the United Kingdom and the Federal Reserve System in the United States.

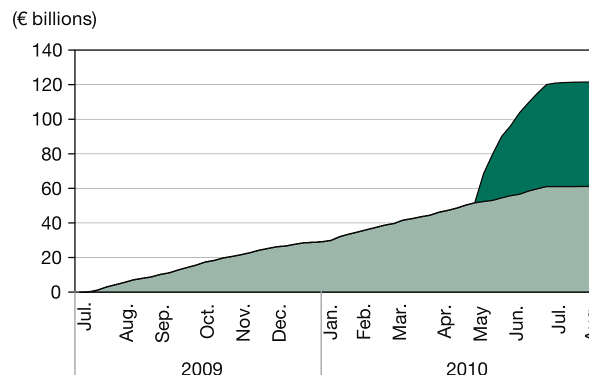
The Eurosystem[8]

While it was sufficient to adjust the operational framework in the first year of the crisis (i.e. with more frequent fine-tuning operations and supplementary longer-term refinancing operations with maturities of three months and subsequently also six months), the Eurosystem decided to adopt non-standard measures in response to the intensification of the crisis after Lehman Brothers collapsed. Hence, in October 2008 the Eurosystem changed the procedures for the implementation of monetary policy by carrying out its main refinancing operations through a fixed-rate full allotment tender procedure.[9] In addition, the Eurosystem temporarily reduced the corridor of the standing facilities to 100 basis points until January 2009. In the light of repeated liquidity imbalances, the Eurosystem also pursued numerous fine-tuning operations in the form of variable tenders. In June 2009, the ECB held a one-year loan auction allotting a total volume of €442 billion. Another two one-year loan auctions were carried out in September and December 2009. Starting in July 2009, the ECB targeted specific securities markets through the purchase of covered bonds, with a total volume of up to €60 billion.[10] This outright purchase of securities is a novelty for the Eurosystem. Since July 2009, the Eurosystem has been continuously buying covered bonds, with a cumulated nominal amount of €60 billion at the end of June 2010 when the programme was closed (Figure 1). Due to new strains in certain market segments caused by fiscal difficulties in some euro area countries, the ECB intervened in the euro area public and private debt securities markets through the Securities Markets Programme, conducted further fixed rate full allotment tenders and reactivated the temporary US dollar liquidity swap lines with the Federal Reserve, which had been stopped in February 2010.

Figure 1

Securities Held by the Eurosystem for Monetary Policy Purposes

(€ billions)



Covered bond purchase programme | Securities markets programme

Note: Figure gives the volumes of bonds bought under the Covered Bond Purchase Programme and from May 2010 also under the Securities Markets Programme.

Source: ECB.

Many euro area governments implemented additional measures, facilitating banks' access to ECB funding. In several countries (e.g. Greece), banks swapped assets for government bonds that were eligible as collateral in the Eurosystem's main refinancing operations and standing facilities. For such temporary swaps, banks were generally charged a fee. In addition, most countries granted guarantees for banks' new bond issues. Banks could pledge these government-guaranteed bonds as collateral to obtain Eurosystem liquidity.

The Bank of England

In the United Kingdom, the Bank of England (BoE) has also adopted a range of non-standard measures. To allevi-

7 For instance, in December 2007 the ECB launched (in cooperation with the Federal Reserve System and other major central banks) US$ liquidity-providing operations, against collateral eligible for Eurosystem credit operations, in connection with the Federal Reserve System's US$ Term Auction Facility. The Federal Reserve System provided the US$ to the ECB by means of a temporary swap line, and the Eurosystem passed on these US$ to its counterparties in repo operations. In addition, on 15 October 2008 the ECB and the Swiss National Bank jointly announced that they would start providing Swiss franc liquidity to their counterparties via €/CHF foreign exchange swap operations. On 10 May 2010, the ECB announced that it would reactivate the temporary US$ liquidity swap lines with the Federal Reserve which started on the following day. The liquidity swap lines with the Fed and the Swiss National Bank had been discontinued in January 2010.

8 More details on the implementation of monetary policy by the Eurosystem in response to the financial market tensions can be found in the article entitled: The implementation of monetary policy since August 2007, in the July 2009 issue of the ECB's Monthly Bulletin.

9 European Central Bank: Governing council decisions on non-standard measures, Monthly Bulletin, June 2009.

10 For further details see http://www.ecb.int/press/pr/date/2009/html/pr090604_1.en.html.

ate strains in longer-maturity money markets, on 19 September 2007 the BoE introduced *term auctions* that provided funds at a three-month maturity against a wider range of collateral, including mortgage collateral, than its weekly open market operations.

In January 2009 the BoE set up an Asset Purchase Facility (APF) to buy up to £250 billion of high-quality assets.[11] £50 billion could be purchased and financed by the issue of Treasury bills and the Debt Management Office's cash management operations, and £200 billion were to be purchased by the creation of central bank reserves. The aim of the facility was to improve liquidity in credit markets by buying UK government securities (gilts), commercial paper and corporate bonds. An indemnity was provided by the government to cover any losses arising from the facility. Via the APF and through the creation of central bank reserves, the BoE bought £200 billion of assets and decided in February 2010 to maintain this stock of asset purchases. More than 99 per cent of the assets purchased were UK government securities (gilts), the remainder being corporate bonds. The BoE did not buy commercial paper.[12] The APF continues to operate its facilities for commercial paper and corporate bonds, with purchases financed by the issue of Treasury bills and the Debt Management Office's cash management operations. By 26 August 2010, £120 million of commercial paper and £1.57 billion of corporate bonds had been bought. Apart from the purchase programme for gilts, corporate bonds and commercial paper, the APF also comprises a *Credit Guarantee Scheme* (CGS), which offers to make small purchases of bonds issued by banks under the UK Treasury's Credit Guarantee Scheme. To date, this facility has not been used. On 3 August 2009 the BoE launched a *Secured Commercial Paper (SCP) Facility*, also through the APF, which enables investment-grade Sterling asset-backed commercial paper securities that support the financing of working capital to be purchased in both the primary and secondary markets. No purchases had been made as at the end of August 2010. Finally, a *Supply Chain Finance Facility* is currently being planned. This facility is intended to provide working-capital financing to the suppliers of investment-grade companies.

In addition, on 21 April 2009 the BoE launched a swap scheme. The *Special Liquidity Scheme* allows banks to temporarily swap their high-quality mortgage-backed and other securities for UK Treasury bills for up to three years. Haircuts apply, and margins are calculated daily. The scheme was designed to finance part of the overhang of illiquid assets on banks' balance sheets by exchanging them temporarily for more easily tradable assets.

Income generated by the APF for the period from January 2009 to February 2010 amounted to £6 million net of a loss on changes in fair value from financial instruments. This income is paid to the BoE as a management fee which also covers all staff costs.[13]

The Federal Reserve System

In the United States, the Federal Reserve System (the Fed) has adopted a range of non-standard measures in response to the current financial crisis. The reasons for adopting these measures were the dysfunction and illiquidity of the credit market, which blunted the stimulus effects from cuts in the fund's rate, and the shortfall of the monetary policy funds rate.[14] These measures are reflected in the establishment of several separate facilities that target specific financial institutions or market segments. Table 1 provides the details of these measures, including the amounts committed and extended under each of the facilities.

The bulk of the measures (in terms of volume) target financial institutions. The most important innovation was the introduction of the *Term Auction Facility* (TAF), which allowed the Federal Reserve System to relieve pressures in short-term funding markets by auctioning term funds to

11 The APF was initially authorised by the UK Treasury to purchase up to a total of £50 billion of private sector assets financed by Treasury bills, thereby ensuring neutrality with respect to monetary policy. The scope of the APF was also designed to enable the Facility to be used by the Monetary Policy Committee (MPC) as a monetary policy tool by financing purchases via the issuing of central bank reserves. For this purpose, the Facility was authorised to purchase up to £150 billion, of which up to £50 billion was to be used to purchase private sector assets. The MPC voted at its March 2009 policy meeting for the Facility to purchase £75 billion of assets financed by the issuance of central bank reserves. The MPC subsequently voted at its May 2009 policy meeting to increase this to a total £125 billion of assets. The MPC voted for two further increases to its asset purchase programme in 2009. At its meeting in August, the MPC decided to finance a further £50 billion of asset purchases so that total purchases would rise to £175 billion. And at its meeting in November, the MPC voted to increase total asset purchases to £200 billion. At its meeting in February 2010, the MPC voted to maintain the stock of asset purchases at £200 billion, but the MPC would continue to monitor the appropriate scale of the asset purchase programme and further purchases would be made should the outlook warrant them. The latest figures for asset purchases are available at http://www.bankofengland.co.uk/markets/apf/results.htm.

12 Purchases of assets were undertaken by a subsidiary of the BoE, the BoE Asset Purchase Facility Fund Limited (BEAPFF). The BEAPFF borrowed from the BoE to pay for the purchases. Hence, the lending to the BEAPFF, rather than the purchased securities, appears as an asset in the BoE's balance sheet.

13 Bank of England: Asset Purchase Facility Fund Limited, Annual Report 2009/2010.

14 G. Rudebusch: The Fed's Monetary Policy Response to the Current Crisis, in: Federal Reserve Bank of San Francisco Economic Letter, Vol. 17, 2009.

Table 1
Measures Adopted by the FED

Programme	Supported institution	Commitment	Usage US$ bn	Usage € bn	Type of measure	Ended	Proceeds US$ bn
Targeted at financial institutions							
Maiden Lane I	Bear Stearns	29	29**	22	Loan		3.6
Maiden Lane II	AIG	19	15**	11	Loan		1.2
Maiden Lane III	AIG	24	16	12	Loan		1.6
AIG Credit Facility	AIG	34	23	18	Credit line		2.2
Term Auction Facility (TAF)	Depository institutions	500	0	0	Collateralised lending	08.03.2010	0.8
Term Asset-Backed Securities Loan Facility (TALF)		200	41*	31	Collateralised lending (ABS)	30.06.2010	0.9
Targeted at mortgage market							
System Open Market Account (SOMA)	Fannie, Freddie, Ginnie	1250	1117	852	Asset purchase	31.03.2010	44.8
System Open Market Account (SOMA)	Fannie, Freddie, Federal Home Loan Bank	175	159	121	Asset purchase	31.03.2010	3.9
Targeted at short-term debt markets							
Money Market Investor Funding Facility (MMIFF)	Money market mutual funds and other financial institutions	0	0	0	Asset purchase	30.10.2009	0.0
Commercial Paper Funding Facility (CPFF)			0	0	Asset purchase (CP)	01.02.2010	4.4
Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF)	Banks		0	0	Asset purchase (ABCP)	01.02.2010	0.1
Targeted at primary dealers							
Term Securities Lending Facility (TSLF)	Primary dealers	25	0	0	Asset swap	01.02.2010	
Primary Dealer Credit Facility (PDCF)	Primary dealers of the FRBNY		0	0	Overnight collateralised loan facility	01.02.2010	0.0
Other							
Asset Guarantee Program (AGP)	Citigroup	220	0		Non-recourse loan	23.12.2009	0.1
Foreign Central Bank Liquidity Swaps			1	1	Currency swaps		2.2
	Sum	2.477	1.401	1.069			66.0

* The Treasury provides US$20 billion of credit protection for loans extended by the Fed's Term Asset-Backed Securities Loan Facility (TALF), which has a volume of up to US$200 billion. This Table distributes the total usage of US$41 billion between the Treasury and the Fed accordingly.

** Commitment includes accrued and capitalised interest. Usage presents the fair value of assets.

depository institutions against full collateral.[15] The TAF allows the Fed to inject term funds through a broader range of counterparties and against a broader range of collateral than open market operations. Besides offering liquidity to banks directly, the liquidity provision through TAF could also reduce worries about the liquidity of other banks and thus contribute to the reactivation of the interbank market. In addition, the *Term Asset-backed Securities Loan Facility* (TALF) was set up to help market participants meet the

15 S. Kwan: Behavior of Libor in the Current Financial Crisis, in: Federal Reserve Bank of San Francisco Economic Letter, Vol. 4, 2009.

credit needs of households and small businesses by supporting the issuance of *asset-backed securities* (ABSs). The more general objective is to make credit available on more favourable terms by facilitating the issuance of, and improving the market conditions for, ABSs. Eligible securities are collateralised by various types of loans such as auto loans, student loans, credit card loans and commercial mortgage loans. Under the TALF, the Federal Reserve System set up a special purpose vehicle (SPV) to buy up to US$1,000 billion of ABSs, granting the borrowers one and three-year loans; in exceptional cases, loans for up to five years were granted.[16] The SPV is partially funded through the US Treasury's Troubled Assets Relief Program (TARP), which has purchased US$20 billion of subordinated debt issued by the SPV. TALF was extended through 30 June 2010 for loans collateralised by newly issued CMBS (commercial mortgage-backed securities) and ceased making loans against all other types of TALF-eligible newly issued and legacy ABSs on 31 March 2010.

Another important novelty for the Fed was the outright purchase of securities issued by government-sponsored enterprises (GSEs) and of mortgage-backed securities (MBSs) guaranteed by GSEs, acquired via open market operations. The aim was to support the mortgage market, and the volumes involved were large: as of 28 July 2010, they amounted to US$159 billion and US$1,117 billion for GSE securities and MBSs respectively. These securities are held in the System Open Market Account (SOMA), which is managed by the Federal Reserve Bank of New York. In addition, the Fed started buying long-term Treasury debt securities to lower long-term interest rates. Given that the funds rate was already pushed to zero, lowering long-term interest rates provided further leeway to stimulate the economy.[17]

The Federal Reserve System also took measures to restore liquidity in short-term debt markets. The *Commercial Paper Funding Facility* (CPFF) is a limited liability company (LLC) that provides a liquidity backstop to US issuers of commercial paper and was intended to contribute to the liquidity in the short-term paper market. The *Money Market Investor Funding Facility* (MMIFF) was specifically designed to restore liquidity in the money market and particularly the liquidity of money market funds.[18] Under the facility, the Fed finances 90 per cent of up to US$600 billion of money market instruments with a remaining maturity of at least 7 days and no more than 90 days. The funding is provided to five special purpose vehicles (SPVs), established by the private sector, which will issue asset-backed commercial paper and borrow from the MMIFF. Both the CPFF and the MMIFF aimed to increase the availability of credit for businesses and households through a revival of short-term debt markets. They differ in terms of the maturities of the assets funded, since the CPFF finances the purchase of three-month commercial paper. Like the MMIFF, the *Asset-backed Commercial Paper Money Market Mutual Fund Liquidity Facility* (AMLF) has the objective of facilitating the sale of assets by money market mutual funds in the secondary market to increase their liquidity.[19] While the AMLF supports the funding of asset-backed commercial paper (ABCP) with a maturity of up to 270 days issued by money market mutual funds, the MMIFF targets certificates of deposit, bank notes and commercial paper. The MMIFF was not used, while the total value of collateral accepted under the AMLF amounted to US$26 billion in June 2009.

Two further facilities introduced in March 2009 in support of primary dealers were: (i) the Term Securities Lending Facility (TSLF), an expansion of the Federal Reserve System's securities lending programme, under which up to US$200 billion of treasury securities were lent to primary dealers and secured for a month (rather than overnight, as under the existing programme) by a pledge of other securities as collateral[20]; and (ii) the *Primary Dealer Credit Facility* (PDCF), which provides overnight funding to primary dealers in exchange for a specified range of collateral, thereby improving the ability of primary dealers to provide financing to participants in securitisation markets. After the introduction of these measures, spreads in the interbank market narrowed but remained significantly above their pre-crisis level. Following the default of Lehman Brothers, spreads rose to unprecedented levels, which has been partly attributed to counterparty risk.[21] Concerning the effectiveness of the non-standard measures and particularly TAF with respect to lowering spreads, the evidence is mixed. While Taylor and Williams found no impact of TAF auctions on Libor spreads, the findings of Christensen et al. and McAndrews et al. suggest that TAF has alleviated the strains in the inter-

16 The amount originally committed under TALF was US$200 billion. An increase of up to US$1,000 billion was under discussion in May 2009 but was ultimately dropped.

17 G. Rudebusch: The Fed's Exit Strategy for Monetary Policy, in: Federal Reserve Bank of San Francisco Economic Letter, Vol. 18, 2010.

18 The facility became operational in November 2008 and expired in October 2009.

19 The AMLF was established shortly after the default of Lehman Brothers on 19 September 2008 and was in effect until February 2010.

20 The Open Market Trading Desk of the Federal Reserve Bank of New York auctioned general Treasury collateral (Treasury bills, notes, bonds and inflation-indexed securities) held by SOMA for loan against all collateral eligible for tri-party repurchase agreements arranged by the Open Market Trading Desk under Schedule 1 and, separately, against Schedule 1 collateral and investment grade corporate securities, municipal securities, mortgage-backed securities and asset-backed securities under Schedule 2.

21 S. Kwan, op. cit.

bank market.[22] Fleming and Klagge examined the effectiveness of the Fed swap lines with other central banks.[23] They find that dollar funding pressures moderated as a result of the usage of these swap lines.

The Federal Reserve System has also supported some financial institutions directly. The so-called *Maiden Lane* (M-L) transactions involved three separate Limited Liability Companies (LLCs), which acquired assets from Bear Stearns (ML-I) and AIG (ML-II and ML-III).[24] The Federal Reserve System provided US$72.7 billion in senior loans to the LLCs. The duration of the loans is 10 years for the Bear Stearns' facility and 6 years for the two AIG facilities.[25] After the repayment of the loans, any remaining proceeds from ML-I will be paid to the Federal Reserve System and, in the cases of ML-II and ML-III, shared between the Federal Reserve System and AIG. The transactions thus resemble those of a so-called bad bank which transfer assets off the institutions' balance sheets. The Federal Reserve System also made a *lending facility available to AIG* in September 2008. The initial commitment under this facility was US$85 billion, secured by a pledge of AIG's assets. The commitment under this facility was reduced to US$60 billion in November as a result of a capital injection of US$40 billion under TARP. In June 2009, AIG agreed with the Fed to swap US$25 billion of debt for equity, which cut the amount of AIG's debt from US$40 billion to US$15 billion. More specifically, the transaction led to a reduction in the maximum amount available under the lending facility from US$60 billion to US$35 billion in December 2009. Subsequent sales of business units by AIG further reduced the ceiling of the credit facility in 2010. In addition, the Federal Reserve System contributed to a ring-fencing agreement with Citigroup, which also involved the US Treasury and the Federal Deposit Insurance Corporation (FDIC), by committing to extend a non-recourse loan should the losses on the specified asset pool exceed a certain threshold.[26] The Fed did not extend credit to Citigroup under this agreement. The US Treasury, the FDIC and the Fed terminated this agreement on 23 December 2009. Finally, on 16 January 2009 the Fed, together with the US Treasury and the FDIC, agreed to provide support to Bank of America, involving a ring-fencing arrangement on a pool of assets. However, following the release of the results of the Supervisory Capital Assessment Program, the support package was abandoned without having been implemented, and Bank of America paid an exit fee of US$425 billion, out of which US$57 billion was allocated to the Fed.

The Federal Reserve System has already implemented an exit from most of the facilities. In June 2009, the Federal Reserve System announced its intention to scale back its commitments under the TSLF from US$200 billion to US$75 billion. Further to this, the amounts auctioned at the TAF's biweekly auctions were gradually decreased, given the reduced demand for this facility.[27] The final auction under TAF was conducted in March 2010 and credit extended under that auction matured in April 2010. As a result of improving market conditions, the Fed ended the AMLF, TSLF, PDCF and the CPFF. All loans under the programmes have been repaid and all commercial paper holdings under CPFF had matured by April 2010. In addition, the MMIFF, which had not been drawn upon, expired on 30 October 2009. With regard to TALF, the offering of loans against newly issued ABS and legacy CMBS was discontinued on 31 March 2010 while loans against newly issued CMBS continued until 30 June 2010. As of July 2010, total loans under TALF amounted to US$41 billion, which will mature by no later than the end of March 2015. Finally, the Federal Reserve System withdrew the programme to guarantee newly issued bank debt securities in October 2009.

Overall, the Fed's exit strategy clearly will need to involve an adjustment of its balance sheet given the sizeable

22 John B. Taylor, John C. Williams: A Black Swan in the Money Market, in: American Economic Journal: Macroeconomics, Vol. 1, No. 1, 2009, pp. 58-83. J.J. Christensen, J.A. Lopez, G.D. Rudebusch: Do Central Bank Liquidity Facilities Affect Interbank Lending Rates?, Federal Reserve Bank of San Francisco Working Paper 13, 2009. J. McAndrews, A. Sarkar, Z. Wang: The Effect of the Term Auction Facility on the London Inter-Bank Offered Rate, in: Federal Reserve Bank of New York Staff Reports, Vol. 335, 2008.

23 M.J. Fleming, N.J. Klagge: The Federal Reserve's Foreign Exchange Swap Lines, in: Federal Reserve Bank of New York, Current Issues in Economics and Finance, Vol. 16, No. 4, 2010.

24 The two Maiden Lane transactions involving AIG differ in terms of the acquired asset pools. ML-II involved the purchase of residential mortgage-backed securities and ML-III the purchase of multi-sector collateralised debt obligations.

25 The interest rate for the senior loan to Maiden Lane I (ML-I) is based on the Primary Credit Rate while, in the other two cases, the interest rate is the one-month LIBOR plus 100 basis points.

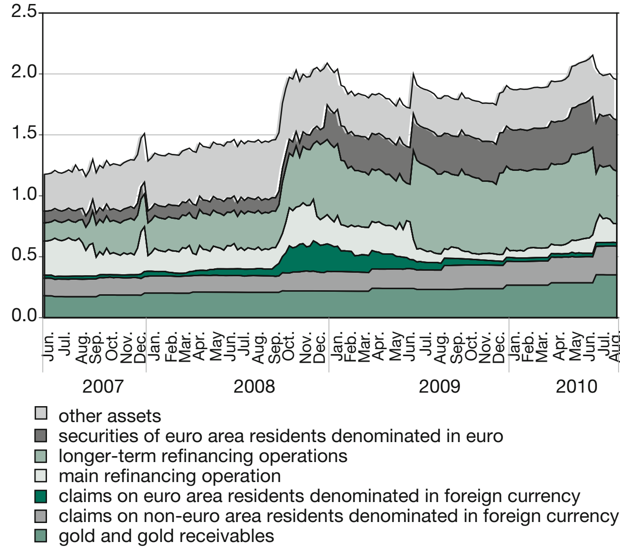
26 The loss-sharing arrangement is complex: Citigroup will cover the first US$39.5 billion of losses on an asset pool of US$301 billion; the US Treasury will absorb 90% of the second loss tranche up to US$5 billion, with Citigroup covering the remainder; the FDIC will absorb 90% of the third loss tranche up to US$10 billion, with Citigroup covering the remainder; should even higher losses materialise, the Federal Reserve will extend a non-recourse loan to cover the rest of the asset pool, with Citigroup being required to immediately repay 10% of such losses to the Federal Reserve.

27 The TAF auctions were reduced from US$150 billion to US$125 billion in July 2009, to US$100 billion in August 2009, to US$75 billion in September 2009, US$50 billion in February 2010 and US$25 billion in March 2010. The amount was split into two biweekly auctions for 28 and 84 days. While the amount offered under the 28-day auction remained US$75 billion in the final quarter of 2009, the amount offered under the 84-day auction was reduced to US$50 billion in October and US$25 billion in November to align the maturities of the two auctions.

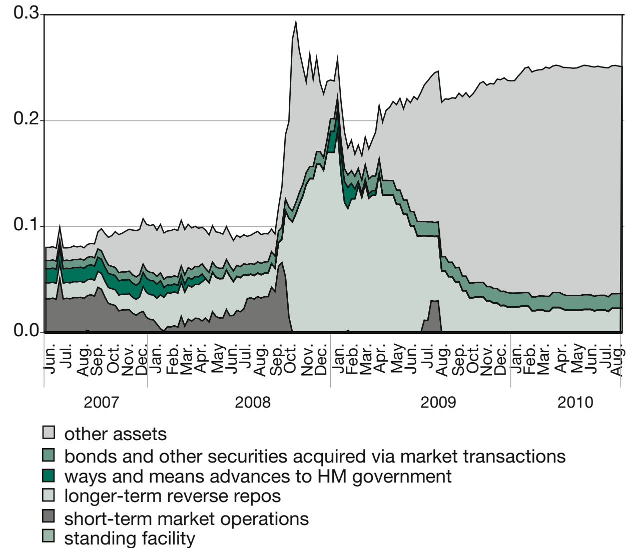
Figure 2

Balance Sheets of the Eurosystem, the Bank of England, and the US Federal Reserve System

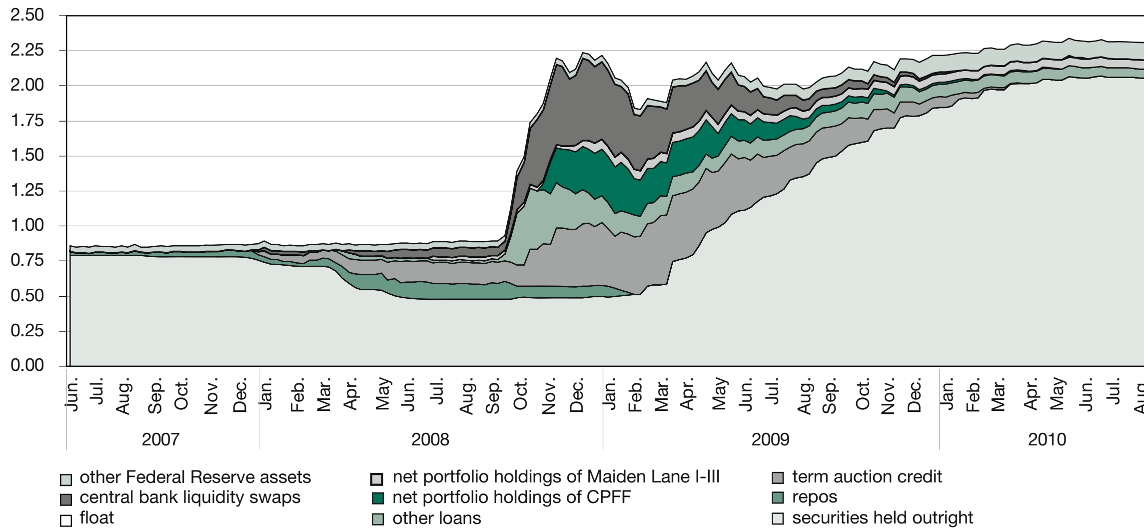
Eurosystem: Total assets (€ trillion)



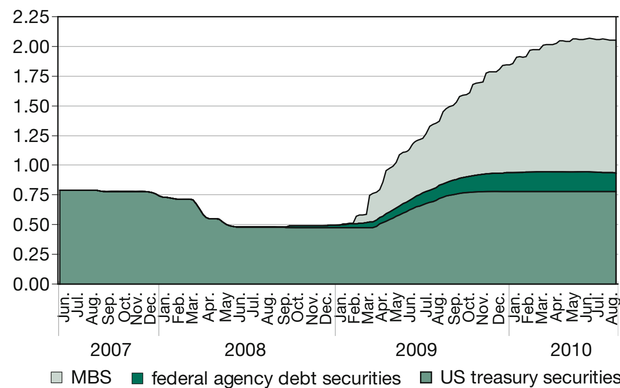
Bank of England: Total assets (£ trillion)



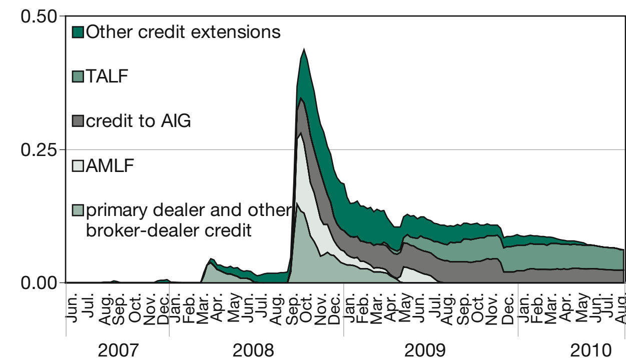
US Federal Reserve System: Reserve bank credit[1] (US$ trillion)



US Federal Reserve System: Details of securities held outright (US$ trillion)



US Federal Reserve System: Details of other loans (US$ trillion)



[1] Reserve bank credit accounts for about 99% of the Federal Reserve System's balance sheet.

Sources: Federal Reserve System, Bank of England, European Central Bank and ECB calculations.

amounts of securities acquired. Rudebusch argues that the Fed could respond to a changing economic environment by simultaneously adjusting the fund's rate and the holdings of securities.[28] However, preference by the FOMC supports the initial use of the fund's rate before the sale of assets.

The different measures vary with respect to their implication for the Federal Reserve System's profitability, but so far the facilities have provided a sizeable return of interest income. The investments in GSE securities and in MBSs guaranteed by the GSEs contributed about US$48.6 billion of net earnings of SOMA from January 2009 to June 2010. In addition, the loan programme (AMLF, PDCF, TALF and the credit line to AIG) earned US$5.8 billion over the period, which translates into US$3.2 billion net of provisions for loan restructuring. TAF earned US$0.8 billion in the same period. However, while the Fed earned a combined profit of US$11.1 billion on the consolidated LLCs (CPFF, ML-I, ML-II and ML-III), the picture is more mixed with regard to the income sources: while all LLCs earned sizeable interest income, the ML LLCs suffered from losses on their portfolio holdings in 2009, which could only be recouped during the first quarter of 2010.[29] In sum, some of the non-standard measures involved sizeable risks for the Federal Reserve System.

Comparison Among the Eurosystem, the Bank of England and the Federal Reserve System

The efforts undertaken by central banks are reflected in the expansion of their balance sheets. Figure 2 shows the main components of the balance sheets of the Eurosystem, the Bank of England and the US Federal Reserve System. Starting in Spring 2008, the Federal Reserve System extended its term auction facilities and repo business, albeit offsetting the effect on its balance sheet by reducing the portfolio of securities it held outright. In September 2008, however, the Federal Reserve System gave up its sterilisation policy and allowed its balance sheet to more than double in size. Likewise, owing to repo transactions and lending to the BEAPFF, the Bank of England doubled the size of its balance sheet. By October 2008 it had even allowed it to triple in size. In contrast, the Eurosystem's balance sheet has been expanded to a lesser extent.

The difference can partly be attributed to the specific features of the respective financial systems and to different operational frameworks, i.e. the number of eligible institutions with access to the Fed's facilities *vis–à-vis* the Eurosystem that require different actions.[30] In addition, differences are partly due to the fact that national governments remain responsible for fiscal policies in Europe.

The most important difference between Europe and the United States is the fact that the Federal Reserve System has been supporting individual institutions, while the Eurosystem's and the BoE's roles have been limited to liquidity extension.

Another important difference in the policies adopted lies in the extent of repurchase agreements and outright purchases of securities. In contrast to the Federal Reserve System, both the Eurosystem and the BoE have used repurchase agreements extensively. However, while the Eurosystem is active only in the covered bonds and government bonds market, and only to a limited extent, the Federal Reserve System's strategy is partly based on large-scale outright purchases of government bonds and private sector securities. The BoE also buys securities outright but limits its acquisitions mostly to government bonds. In addition, a government indemnity shields it from any losses resulting from these investments. As at the Federal Reserve System, the BoE allowed these purchases to increase reserve balances.

In sum, while the crisis responses of the Eurosystem, the BoE and the Fed have been largely similar, there are important differences. In particular, the Federal Reserve System has been more expansive and has also targeted individual financial intermediaries, while the Eurosystem's and the BoE's actions have been limited to liquidity extension. It is also worthwhile to note that monetary policy actions and bank rescue measures have been becoming more and more intertwined (examples of this being the asset purchase programme in the UK and the collateral requirements of the Eurosystem). Finally, going forward, it is important that central banks find viable exit strategies from their support measures.

28 G. Rudebusch: The Fed's Exit Strategy..., op. cit.

29 These figures are taken from the Federal Reserve System Monthly Report on Credit and Liquidity Programs and the Balance Sheet. Profits and losses refer to the four quarters of 2009 and the first half of 2010.

30 Mr. Trichet in a speech at the University of Munich, 13 June 2009. The IMF makes the same point in a recent publication: Fiscal Implications of the Global Economic and Financial Crisis, IMF Staff Position Notes SPN/09/13.