

The ECB's Unconventional Monetary Policy

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ABSTRACT

Responding to the financial crisis, the European Central Bank (ECB) changed its strategy to what has been called 'Unconventional Monetary Policy' (UMP). Since October 2008 a series of liquidity-enhancing measures have been enacted, more and more following the pattern set by the US Federal Reserve System (Fed). The UMP was heavily criticised for several reasons: it was useless, the European Monetary Union experiencing a liquidity trap; it would induce unwarranted regional effects; and the ECB would violate its mandate set by the Treaty and by that lose its credibility. This article resumes the debate and points at a specific handicap for the ECB's actions. Unlike the Fed, the ECB is not in a position to use a Europe-wide liquid asset for its open-market operations. The conclusion is that the assignment of roles to monetary policy and fiscal policy within the European Monetary Union has to be adjusted.

Keywords: *Debt Release, Eurobonds, Financial Crisis*

1 Introduction

The recent financial crisis has swiftly spread throughout the international financial system demonstrating that financial institutions are interwoven into a net of worldwide interconnectedness. So, the European Central Bank like the Federal Reserve System in the United States and the Bank of England were challenged nearly simultaneously and urged to the provision of liquidity to financial institutions to an unprecedented scope. Likewise, they had to recognize the limits of conventional monetary policy for crisis resolution.

Even so, the ECB was confronted with specific problems in implementing unconventional monetary policy measures. In hindsight, these problems can be traced back to shortcomings in the basic relationship between (European) monetary policy and (national) fiscal policies in the European Monetary Union. In the following assessment of the ECB's Unconventional Monetary Policy we discuss different options of resolving these deficiencies.

To begin with, we briefly describe the emergence of the financial crisis in Europe, highlighting the typical patterns (section 2). Then, the ECB's non-standard monetary policy measures in response to the financial crisis and the sovereign debt crisis are reviewed with a special focus on asset purchase programmes (sections 3 and 4). Against this background, our assessment of UMP (section 5) is based on the concept of 'stock-flow consistency' in monetary economics.

2 Emergence of the financial crisis in Europe

The recent financial crisis started in 2007 when subprime mortgages failed on a large scale in the US housing market. In the course of a long-term housing boom, the US administration had encouraged Fannie Mae and Freddie Mac, two big government-sponsored mortgage banks, to guarantee mortgages to low-income home-buyers. When the housing bubble burst, the risks spread all over the financial system due to a high degree of securitisation and leveraging. Since financial institutes had also practised short-term borrowing to a large extent, the crisis accelerated. So, the US government had not only to back both mortgage banks, 'the largest rescues in financial history' (The Economist, November 21st 2015, p. 68), but also to provide fresh capital to big American banks and insurance companies. Lehman Brothers, however, an investment bank with high international exposures was not bailed out. Its insolvency in September 2008 transmitted the crisis to Europe, hitting financial institutions in the United Kingdom, Ireland, Belgium, Germany and – later on – France and Spain¹. As a first consequence, the European interbank market collapsed, urging the ECB to provide additional liquidity on a large scale. Secondly, government debt rose extraordinarily, due to the rescue of banks, anti-crisis measures, built-in stabilisation, and second-round effects of consolidation.

The present performance of the European financial sector corresponds to typical patterns of financial crises. As Jorda, Schularick and Taylor have shown in an empirical study (2011), recessions following a financial crisis have deflationary tendencies that are considerably more pronounced than in

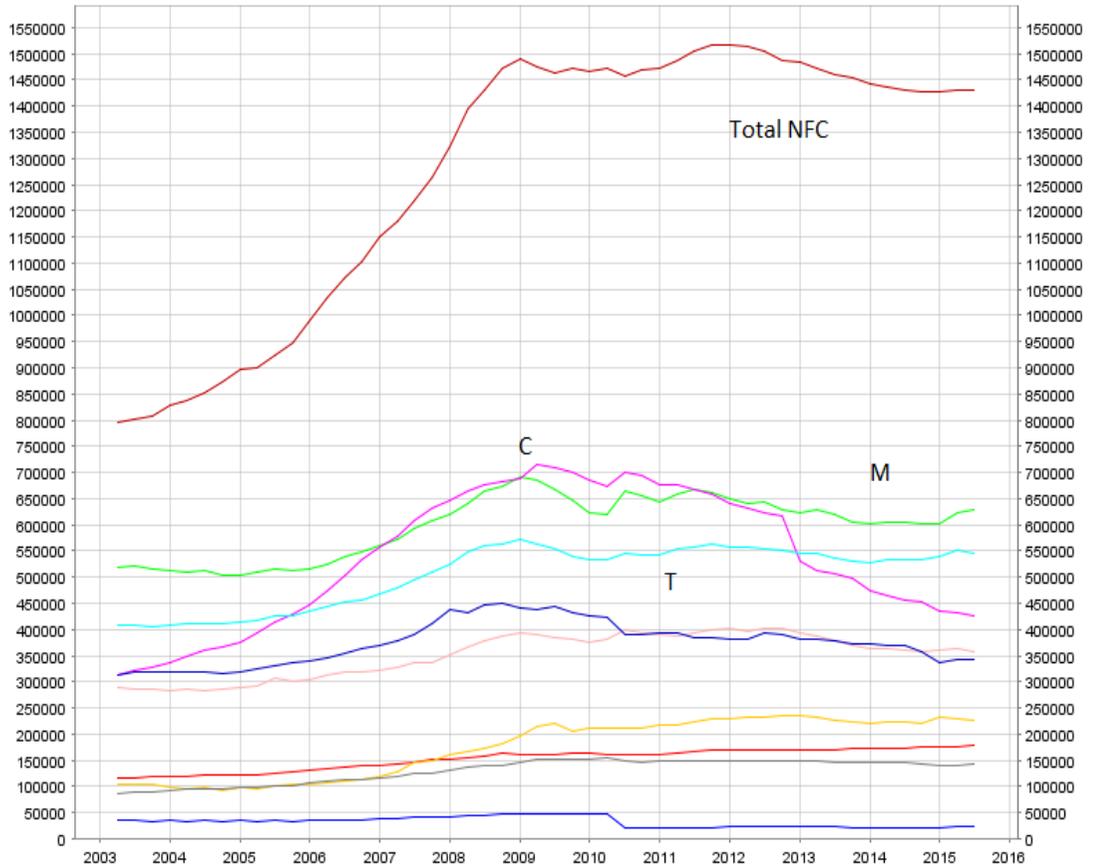
¹ A thorough description of this contagion process is given by Admati/Hellwig 2013, Chapter 5.

the case of 'normal' recessions. In particular, there is 'a strongly negative impact on loan growth' (p. 343). Evidently, the reduction of their loan portfolios is the main strategy of banks to re-establish capital adequacy in their balance sheets. On the other hand, they are more reluctant to make losses evident by adjusting asset prices. So, Jorda et al. conclude that loans and securitised assets follow different cycles and have different predictive values. As a consequence of the banks' strategy, the balance sheet repair will take time and the crisis will endure, postponing the recovery of the economy. Also, the real burden of debt is growing during a deflation, thus aggravating the problem. Private households as well as private enterprise have to reduce their debts in order to maintain credibility. So, private saving is increasing during the crisis although interest rates are low. With the changed behaviour of private aggregate demand, the risk rises that the economy may fall into the trap of a general depression. More and more economists recognize that Europe – as well as the US – comes close to a constellation where Japan found itself during the decade after 1990 (see Koo 2013; Eggertsson/Krugman 2012).

Empirical data for the EMU confirm these theoretical insights. MFI loan growth to the private sector has receded in EMU since 2008 (Figure 1) and as a consequence of the crisis the average government debt ratio increased from 67 per cent in 2008 to more than 90 per cent (Figure 2).

3 The role of monetary policy

The emergence and spreading of the financial crisis had dramatically increased the uncertainty on the value of money assets. Many securities had become 'toxic assets'. Since the market value of money assets depends on expected returns it turned out that the balance sheet of a bank which contained securities at historic value did not indicate the viability of the bank anymore. So, the interbank money market dried up not only due to an excess demand of liquid assets but also because the insolvency risk of banks had increased. In this constellation the European Central Bank had to intervene and act as a lender of last resort for the banking system. Although the ECB had shown concerns about inflation in July 2008 and raised the interest rate for main refinancing operations (MROs) to 4.25 per cent, it made a full turn-around in its monetary policy strategy in October and – following the Fed – reduced the interest rate in several steps within six months to 1 per cent. In addition, it changed its open market policy from variable rate to fixed rate tenders, providing the banks with full allotments of liquidity at the announced rate. This strategy of providing additional liquidity



Outstanding amount of loans, millions of €, by industry: construction (C), manufacturing (M), Trade (T) and others according to NACE; source: ECB, Statistical Data Warehouse.

at reduced rates was continued during the following years until the MRO rate reached 0.05 per cent

Figure 1: MFI loans to non-financial corporations (NFC) in the euro area

and the corresponding deposit rate became negative (-0.2 percent) in September 2014. Evidently, conventional monetary policy measures had come to their limits.

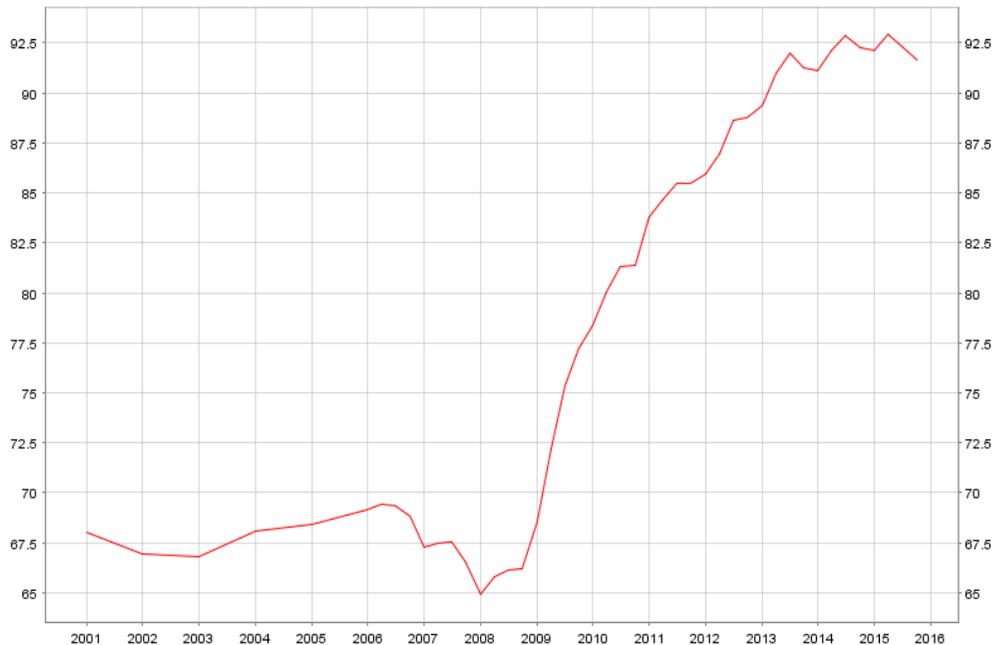
So, the ECB also applied a bunch of measures which have been dubbed 'unconventional monetary policy' (UMP). In their review of 2012 on the central bank's actions Cour-Thimann and Winkler distinguish three phases of unconventional monetary policy.

(I) The first phase is mainly shaped by the incidents of the financial crisis (Lehman collapse). In addition to the reduction of interest rates, the ECB facilitated the availability of loans to banks, the so-called 'enhanced credit support' in 2008 (Trichet 2009). In reaction to the prevalent crisis these non-standard measures consisted of longer terms for refinancing operations, lending of foreign currency, the Covered Bond Purchase Programme (CBPPI), easing requirements for eligible collateral, and most importantly – as already mentioned – full allotment in all refinancing tenders at a fixed rate (ECB 2010, p. 65).

(II) The second phase from 2010 onwards was influenced by the impression of the euro area debt crisis: The tensions arising from these developments also affected securities markets across the board, as not only the bond markets, but also the foreign exchange and equity markets exhibited heightened volatility. For this reason, the ECB decided to take action by purchasing corporate and government bonds in certain sectors of the secondary market. For a better functioning of the monetary policy transmission 'the ECB established its Securities Markets Programme (SMP) to ensure depth and liquidity in those markets that were dysfunctional' (Cour-Thimann/Winkler 2012, p. 774). According to the ECB, three main channels of potential disruptions caused by malfunctioning government bond markets were identified as price channel, liquidity channel and balance sheet channel. Besides its monetary policy purpose, the SMP was also designed for helping governments to find a bearable solution to the crisis and to restore the sustainability of public finances.

(III) The intensifying sovereign debt crisis and banking sector strains characterize the third phase. Although the SMP was maintained from May 2010 to September 2012, one can determine two periods of large bond purchases: when Italy and Spain and their government bond markets risked becoming dysfunctional the ECB decided to actively implement its SMP in the summer of 2011. Despite this financial support for the euro area, in the course of 2012 the euro area banking system was increasingly put under strain. With regard to depressed sovereign bond prices which weakened bank balance sheets and markets that questioned the viability of a number of banks across a range of euro area countries, the central bank had to act again. On 6 September 2012 the ECB decided on a controversially viewed scheme, the Outright Monetary Transactions (OMTs) as 'signs of increasing fragmentation in the funding conditions for households and firms [were identified] across the euro area' (Cour-Thimann/Winkler 2012, p. 778). This programme – although it has never been adopted – would allow the ECB to make purchases in secondary, sovereign bond markets in unlimited amounts. It was intended to carry on the measure of purchasing government securities under SMP. It has to be emphasized that it is a 'necessary condition for [OMTs, that strict and effective conditionality is] attached to an appropriate European Financial Facility/European Stability Mechanism

(EFSF/ESM) programme' (ECB 2012). Combined with an explicit reference to an exit and other terms², the OMT



Consolidated Maastricht debt, quarterly data, as % of GDP. Source: ECB

Figure 2: Government debt ratio in the euro area (19)

should address a number of concerns relating to the SMP. As the dissatisfaction of several members of the Governing Council had grown, the OMT-design took their concerns into account, particularly in an attempt to ensure 'that monetary policy was associated with fiscal discipline' (Lombardi/Moschella 2015, p. 13). It also must be emphasized that the OMT is compatible with EU-law, following the decisions of the European Court of Justice in June 2015.

After 2012, enduring deflationary tendencies in the euro area threatened to unhinge long-term inflation expectations (Lombardi/Moschella 2015, p.15). So, the ECB recognized that a 'more broad-based asset purchase programme' was warranted (Draghi 2015). Since June 2014, the ECB has conducted additional credit easing policies, in particular

² See Cour-Thimann/Winkler 2012: 779.

- Targeted longer-term Refinancing Operations (TLROs) that allow banks to borrow from the Eurosystem at fixed interest rates for a period of up to four years
- The launch of two asset purchase programmes comprising asset-backed securities (ABSPP) and covered bonds (CBPP3).

Finally, in January 2015, the ECB decided to expand its asset purchases in the secondary market substantially and to include sovereign bonds issued by all important entities located in the euro area (ECB 2015). The central bank announced that it will

- buy securities up to 60 bn € per month
- maintain this volume of purchases until September 2016 (thus including an element of 'forward guidance', see ECB 2015a).

In December 2015, the duration of this purchases programme was extended by six months. So, the programme will end not before March 2017.

The expanded asset purchase programme (EAPP) is not only unprecedented by size and scope but also provides a new quality of non-standard measures. First, the programme is intended to enhance liquidity of the banking sector. Consequently, no sterilization of liquidity effects is applied. Second, to counter concerns about unbalanced and unwarranted fiscal effects, the programme was bound to a set of conditions (Praet 2015):

- the central bank pretends that purchases are subject to limited loss sharing: 20 per cent of purchases are held by the ECB, the rest (80 per cent) is recorded in the books of national central banks;
- avoiding a bias in the national distribution of securities, the ECB purchases securities according to its capital key;
- limits to the purchase of specific securities apply;
- securities eligible for purchases are required to have good ratings.

In the course of conducting its programmes of unconventional monetary policy, the central bank's balance sheet expanded significantly. As a consequence, the balance sheet has been discussed as the new indicator of monetary policy (ECB 2015b).

4 Asset purchases in focus

In the first place, the ECB had started its response to the financial crisis by increasing the liquidity supply to the banking sector, introducing more and more favourable conditions for banks. But more and more it had to recognize that this move towards a nearly unconditional liquidity supply did not work.

So, the central bank changed its focus of UMP and relied on asset purchase programmes, in particular on buying sovereign bonds. As early as June 2009, the ECB had started to buy bank obligations to stabilise financial markets. But in May 2010 – after the outbreak of the Greek debt crisis – the ECB had to intervene in financial markets by issuing its 'Securities Markets Programme' which predominantly comprised the purchase of sovereign (at the time in particular Greek) bonds. These purchase programmes were designed as temporary measures but had to be re-activated and intensified in August 2011. Until spring 2012, the ECB had accumulated assets amounting to more than 200 bn €.

The focus on 'Quantitative Easing' (QE) gained a new quality when Mario Draghi, President of the ECB, announced the programme of 'Outright Monetary Transactions' in September 2012. This programme should enable the ECB to purchase (short-term) sovereign bonds in unlimited amount, albeit on the condition that the country concerned is subject to a restructuring programme supervised by the European Stability Mechanism (ESM). By realising the OMT programme, the ECB would take the role of a fiscal agent for the ESM in order to support the functioning of this mechanism of consolidating public budgets. Up to date it was not implemented, indicating the big influence ECB announcements may exert on expectations in financial markets.

Nonetheless, the ECB recognized a need to act in order to improve the overall performance of financial markets. The central bank intensified its policy of quantitative easing further in 2014 when it launched its 'Asset-Backed Securities Purchase Programme'. Finally, it turned to 'pure' quantitative easing, imitating the Fed strategy, when it started its 'Expanded Asset Purchase Programme' in February 2015. Eventually, the ECB has announced the amount and composition of securities it will buy per month as well as the duration of its activity. This corresponds exactly to the Fed programme of QE which was ended in October 2014.

Explaining its UMP measures the ECB has always underlined that its activities were compatible with its predominant objective of achieving price stability in the medium term. In particular, the ECB has stressed to understand these measures as complementary not as substitutes for the conventional monetary policy of providing liquidity to the banking sector. So, liquidity effects of asset purchases were sterilized until 2012. With inflationary expectations perceived as being stable, asset purchases were particularly taken as a means of overcoming disturbances in the transmission process of (conventional) monetary impulses. That is to say in particular that asset purchases should restrain disturbances in bond markets. This interpretation was highlighted by Cour-Thimann and Winkler. UMP was 'to ensure the effective transmission of standard policy to the euro area economy' (p. 781). Accordingly, compared to the Fed and the Bank of England the ECB was always keen to distinguish the measures described

above from quantitative easing.³ Cour-Thimann and Winkler point out that the reason for the ECB approach lies in the specific structure of the financial system in the euro area which provides predominantly bank-based finance to private enterprise. As a consequence, it is crucial for the ECB to ensure that solvent banks throughout the euro area do not face liquidity constraints. Improvements in countries' economic fundamentals and banks' financial positions as well as avoidance of disorderly deleveraging are only possible in the euro area, if the ECB takes fine-tuning measures to bring governments and banks time to adjust (p. 783). Even so, the limits of the ECB's ability to preserve financial stability became evident. Scheller (2014) sees the reason in a lack of adequate and effective intergovernmental cooperation in the field of macroeconomic and macro-prudential policies. So, the crisis also forced the EU Member States to achieve more progress in strengthening macroeconomic and macro-prudential governance at the Union level (Scheller 2014, p. 125-126). But these are long-term issues. The immediate challenge urged the ECB to qualify its policies. At least from 2015, the central bank turned to 'Quantitative Easing' according to the Fed model and relied completely to the 'asset market channel' (Cour-Thimann/Winkler, p. 790).

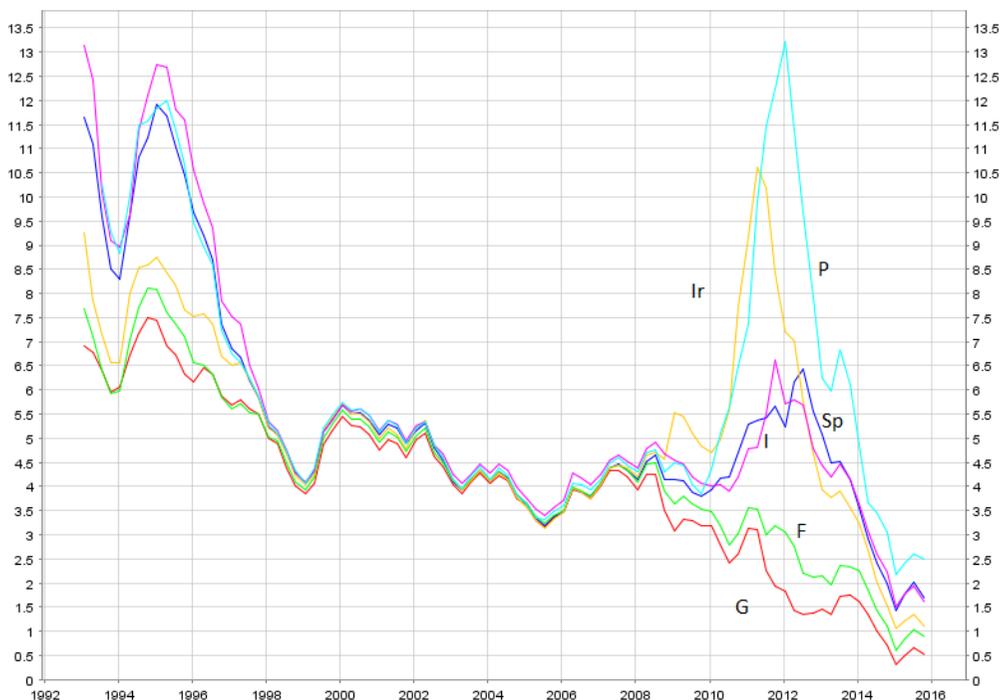
5 Assessment

It is well known that liquidity-enhancing measures of monetary policy are ineffective if the economy is caught in a 'liquidity trap'. Expectations on the future performance of the real economy are so uncertain that investors are not prepared 'to part with money' (Keynes 1933). In this constellation of a high liquidity premium an accommodating monetary policy providing additional liquidity to the financial sector and reducing official MRO rates (near to zero) has no effect on the long-term rate of interest and so cannot stimulate real investment and aggregate demand. For that reason, the 'transmission process' of monetary policy is disturbed. To overcome a liquidity trap, an exogenous impulse is necessary which stimulates the economy. Such a stimulus was given in the United States by a highly expansive fiscal policy. In Germany, a similar effect was exerted by a high and stable demand for export goods and – due to labour market reforms and the introduction of minimum wages – by an increase of private consumption. The rest of EMU was largely occupied with consolidating public budgets. So, the role of playing a 'deus ex machina' and counteracting deflationary tendencies fell to the ECB. By its asset purchases the central bank tried to

³ For a more concrete view on Quantitative Easing of the Bank of England and the Federal Reserve see Joyce 2011 and Blinder 2010.

directly stabilise asset prices in financial markets and – accordingly – to stabilise and reduce the long-term rate of interest.

As the interest rate spreads in bond markets indicate, the ECB's strategy seems to have achieved this objective. After 2012, a narrowing of spreads in



Nominal rates for government bonds of 10 years maturity, per cent p.a. for Germany (G), France (F), Italy (I), Spain (Sp), Ireland (Ir), Portugal (P), quarterly data. Source: ECB
euro area bond markets can be observed (Figure 3).

*Figure 3: Long-term interest rates for government bonds (market rates)
in selected euro area countries*

Conventional economic wisdom complains that such a monetary policy surmounts its limits if asset purchases are not intended to control interest rates in money markets – the case of conventional monetary policy which buys and sells financial assets – but instead are held as investments. In particular, if the central bank buys sovereign bonds it acts on behalf of the government, that is to say implements fiscal policy. For instance, Neumann (2014) found that the ECB by its market intervention provided a substantial contribution to the Italian budget. Along this line of argument the European

Central Bank was suspected to commit a violation of the Treaty (Article 123 TFEU). Neumann argues that market interventions manipulating interest rates are not justified in the capitalist order. His argument rests on the assumption that central banks are not better informed than financial markets. However, the rational expectations model underlying this reasoning is a bad advisor in a financial crisis. In this case, expectations on the sustainability of public budgets may be misled and may overshoot so that the government concerned has no room of manoeuvre for consolidation (Tomann 2014, p. 123). Accordingly, if the economy is approaching a 'bad equilibrium' (De Grauwe 2011) – whatever the causes – there is a case for central bank intervention (Art. 127 (5) TFEU).

Cour-Thimann and Winkler (2012) underline this conclusion on the basis of a flow-of-funds analysis. They argue that the financial crisis has triggered a process of deleveraging in the financial sector, that is the reduction of net-debt positions in order to regain 'stock-flow consistency'. In a macroeconomic perspective this process of deleveraging requires compensatory transactions to be successful. Macroeconomic interdependence excludes that all sectors can deleverage – that is increase their net assets – at the same time. So to avoid a vicious circle triggered off by fire sales, government intervention is required. It is true that in principle several options are open to compensate for deleveraging of the financial sector: First, the government may increase the supply of debt. Second, the rest of the world may act as net-seller of financial assets (take a debtor's position). Third, 'more accumulation of non-financial assets for the economy as a whole' as well as 'a switch by investors towards equity investment (instead of debt assets) and by debtors to step up equity funding' would resolve the 'paradox of leverage' (p. 790). But in a situation of high uncertainty and over-indebted governments, the central bank may be the only player left to take on the role of an 'intermediary of last resort' (p. 788). Cour-Thimann and Winkler point at a new transmission channel of monetary policy ('asset market channel'): 'Higher valuation following purchases (by the central bank) can both foster the switch to equity of investors and debtors alike, as well as boost non-financial investment' (p. 790).

Considering the experience of the financial crisis, the ECB has also changed the theoretical underpinnings of its monetary policy concept. Apart from interest rate effects and effects on expected interest rates it is now recognized that in a financial crisis, when the zero lower bound of interest rates has been reached, quantitative monetary effects determining the size and composition of the central bank's balance sheet are important indicators which should be taken into account (Cour-Thimann/Winkler 2012, p. 797; ECB 2015b).

5.1 Risks and side effects

Although the ECB has avoided a disorderly deleveraging in the eurozone's financial sector so far, the problem of achieving stock-flow consistency is not resolved yet. Two risks are still attached to the ECB's unconventional monetary policy. First, since the ECB's purchase programme successfully reduced the burden of public debt (in terms of reduced interest payments) it may have induced moral hazard with regard to national governments. It is true that it was an intended effect of the programme to provide leeway for national governments to pursue consolidation programmes. But the incentive to do so was weakened. Should the ECB try to sell these assets, the interest rate risks would become virulent again. From a stock-flow perspective, this points at the advantage of an alternative strategy, that is to implement a debt release in case of unsustainable public debt (Tomann 2014). There is an important difference between the two strategies. In the case of a debt release, the government concerned will immediately be exposed to the incentives of market discipline again. So the conclusion is that the ECB may still provide a debt release to over-indebted governments and reduce their interest burden by cancelling these assets (or parts of them) instead of holding them in the investment book at amortized cost and receiving interest earnings. A strategy of debt release would re-establish stock-flow consistency and expose governments to market discipline again. It would also diminish the banks' requirements of balance sheet repair.

Alternatively, the risk of realising losses is with the banks (bail-in). So, the ECB's asset purchase programme induces a second and related moral hazard risk: banks holding government bonds are relieved from realising losses and clearing their balance sheets. Parts of the UMP are exactly designed to avoid those clearings, see for example the programme of TLROs of 2014. Even so, European bond markets continue to be high risk investments. As long as the ECB keeps on purchasing bonds, the interest rate risk is suppressed. Some observers speak of 'financial repression'. Moreover, the ECB has not explicitly declared its future asset management. Instead, it deliberately leaves future decisions open with a view to demonstrate its independence (Lombardi/Moschella 2015, p. 7, 13; Draghi 2015a). So, the interest rate risk remains and indicates that a medium which fulfils the liquidity function in European capital markets is lacking.

Against this background, it is still an open question which effect the UMP will have on the ECB's credibility. Before the crisis broke out, the ECB's credibility rested on the confidence that the central bank disposes of powerful and effective instruments to combat inflation. It is true that inflation is not the problem at present but rather the solution, given the persistent deflationary tendencies in Europe. But this may change. Taking a long-term perspective, the question arises if the central bank is capable of collecting this huge amounts of liquidity it has created. It may turn out that the central

bank has only limited room of manoeuvre to reverse its course without exposing banks again to the risk of insolvency.

5.2 Central bank independence

Unlike in the United States, the European bond market is segmented with the consequence that a liquid asset comprising and pooling all the risks ('Eurobond') does not exist. In the absence of Eurobonds the ECB's asset purchases necessarily had divergent regional effects so that it was interpreted as being 'akin to regional policies' (Balcerowicz 2014, p. 9). Although the central bank aimed at stabilising financial markets on a Europe-wide scale, it had to use national government bonds enacting its asset purchase programmes. Also, the LTROs enabled local banks to buy their national government bonds at low cost. In total, UMP's liquidity provisions proved very comfortable to national governments, so as if they had command of their national central banks. It is evidently an unwarranted effect of the UMP that the role of national debt management was assigned to the central bank. Buying national bonds, the ECB was even seen in the role of a 'lender of last resort for governments' (Schwäbe 2012). Although this role may be regarded as an unavoidable by-product of the central bank's predominant objective of stabilising financial markets, it reveals an institutional shortcoming in the EMU. A lender of last resort should provide liquidity to banks when asset prices fall in a crisis (Riese 2004). Governments, however, that are over-indebted do not suffer from a lack of liquidity but are insolvent. The classical remedy in such a case is that the (national) central bank prints money and extinguishes the burden of debt by inflation. This way is explicitly excluded in the EMU, preserving price stability being the predominant objective of the ECB (Art. 127 (1) TFEU). The notion of 'lender of last resort for governments' is a camouflage concealing that the ECB has intervened into the realms of fiscal policy. Rescue measures as well as distributional issues should remain in the responsibility of governments.

The institutional deficit which comes to the fore here is the lack of Eurobonds. Eurobonds would provide sufficiently liquid assets for the ECB to intervene in financial markets and fulfil its monetary policy objectives. The provision of access to Eurobonds and the risk sharing connected to those bonds is, by contrast, the task and responsibility of governments. By appropriate regulations, as is the case in the United States, Eurobonds are

even compatible with the no-bail-out clause of the Treaty (Art. 125 TFEU). The regulations of the ESM provide a first step into this direction. The ESM provides assistance to governments in distress but the responsibility for those measures is with the European Council, not the ECB.

6 Conclusion

Responding to the financial crisis, the European Central Bank had to protect the banking sector from illiquidity, acting as 'intermediary of last resort'. But due to an intense relation between banks and governments in the euro area and a dysfunctional fiscal policy the central bank had also to counteract private deleveraging. This activity lend it the image of assisting governments which were perceived as being over-indebted. So, the assignment of roles to monetary policy and fiscal policy was blurred.

Our analysis suggests that the widespread critique of the central bank to overdraw its competences was misleading. It would have been the role of governments or – on the European level – the ECOFIN Council to take responsibility for the legacy of high public debt. The ECB's asset purchase programmes have given temporary relief - but in the end will not resolve the moral hazard problem in public finance.

That requires new institutions but also a coherent political will. A monetary union like the EMU explicitly excludes exchange rate changes as a political instrument following an intention to replace currency competition by co-operation. This intention seems to be out of the minds of European governments. They have to be reminded that joint risk-taking in public finance is part of that co-operation. Whatever the institutional design, the common responsibility for public finance should not be left with the central bank.

Reference

1. Admati, A. and M. Hellwig, 2013. *The Bankers' new clothes*. Princeton: Princeton University Press.
2. Balcerowicz, L., 2014. Euro: The Main Problems and Solutions. In: J. Hölscher (ed.) *Poland and the Eurozone*. Basingstoke and New York: Palgrave Macmillan, pp. 3-12.
3. Blinder, A., 2010. Quantitative Easing: Entrance and Exit Strategies. *Federal Reserve Bank of St. Louis Review*, November/December 2010, 92(6), pp. 465-479.

4. Cour-Thimann, P. and B. Winkler, 2012. The ECB's non-standard monetary policy measures: the role of institutional factors and financial structure. *Oxford Review of Economic Policy* 28 (4), pp. 765-803.
5. De Grauwe, P., 2011. A Fragile Eurozone in Search for a Better Governance. *CESifo Working Paper Series* No 3456.
6. Draghi, M., 2015. The ECB and its Watchers XVI Conference. Speech, 11 March 2015, Frankfurt/Main (online). Available at: <http://www.ecb.europa.eu/press/key/date/2015/html/sp150311.en.html>.
7. Draghi, M., 2015a. *Introductory statement to the press conference* (online). Available at: <http://www.ecb.europa.eu/press/pressconf/2015/html/is151203.en.html>.
8. Eggertsson, G.B. and P. Krugman, 2012. Debt, deleveraging, and the liquidity trap: A Fisher-Minsky-Koo approach. *Quarterly Journal of Economics* 127 (3), pp. 1469-1513.
9. European Central Bank, 2010. The ECB's response to the financial crisis. *Monthly Bulletin* October, pp. 59-74.
10. European Central Bank, 2012. *Technical features of Outright Monetary Transactions (Press release)*, (online). Available at: http://www.ecb.europa.eu/press/pr/date/2012/html/pr120906_1.en.html.
11. European Central Bank, 2015. *ECB announces expanded asset purchase programme* (press release), (online). Available at: http://www.ecb.europa.eu/press/pr/date/2015/html/pr150122_1.en.html.
12. European Central Bank, 2015a. The transmission of the ECB's recent non-standard monetary policy measures. *Economic Bulletin* 7/2015, (online). Available at: http://www.ecb.europa.eu/pub/pdf/other/eb201507_article01.en.pdf.
13. European Central Bank, 2015b. The role of the central bank balance sheet in monetary policy. *Economic Bulletin* 4/2015, (online). Available at: <http://www.ecb.europa.eu/pub/pdf/ecbu/eb201504.en.pdf>.
14. Joyce, M., 2011. The United Kingdom's quantitative easing policy: design, operation and impact. *Quarterly Bulletin*, 2011 Q3, pp. 200-212.
15. Lombardi, D. and M. Moschella, 2015. The government bond buying programmes of the European Central Bank: an analysis of their policy settings. *Journal of European Public Policy*, August 2015, pp. 1-20.
16. Jorda, O., M. Schularick and A.M. Taylor, 2011. Financial Crises, Credit Booms, and External Imbalances: 140 Years of Lessons. *IMF Economic Review*, 59, pp. 340-378.
17. Keynes, J.M., 1933. A Monetary Theory of Production. In: D.E. Moggridge and E. Johnson (eds) *The Collected Writings of John Maynard Keynes*, vol. XIII. London: Macmillan, pp. 408-412.
18. Koo, R.C., 2013. Balance sheet recessions as the "other half" of macroeconomics. *European Journal of Economics and Economic Policies*, 10 (2), pp. 136-157.
19. Neumann, M.J.M., 2014. Die notwendigen Grenzen der Geldpolitik. *Frankfurter Allgemeine Zeitung* Nr. 119, 23 May, p. 16.
20. Praet, P., 2015. Public sector security purchases and monetary dominance in a monetary union without a fiscal union. Speech 11 March 2015, Frankfurt/Main, (online). Available at: http://www.ecb.europa.eu/press/key/date/2015/html/sp150311_1.en.html
21. Riese, H., 2004. Bagehot versus Goodhart: Why a Central Bank needs Commercial Banks. In: J. Hölcher and H. Tomann (eds) *Money*,

- Development and Economic Transformation – Selected Essays by Hajo Riese.* Basingstoke and New York: Palgrave Macmillan, pp. 1-59.
22. Scheller, H., 2014. The design of the ECB's toolbox: fitting the EMI blueprint into a deeper EMU. In: I. Maes and F. Moss (eds) *Progress through crisis? Proceedings of the conference for the 20th anniversary of the establishment of the European Monetary Institute.* European Central Bank, July 2014, pp. 113-128.
 23. Schwäbe, C., 2012. Unkonventionelle Geldpolitik – Warum die EZB ihre Unabhängigkeit nicht verloren hat. *List Forum für Wirtschafts- und Finanzpolitik*, 38 (3-4), pp. 147-172.
 24. The Economist, 2015. Fannie Mae and Freddie Mac – A funny form of conservation. November 21st, p. 68.
 25. Tomann, H., 2014. Building new monetary institutions in the EMU as a response to the financial crisis: A Keynesian perspective. In: J. Hölscher and M. Klaes (eds) *Keynes's Economic Consequences of the Peace.* SCEME Studies in Economic Methodology. London: Pickering & Chatto, pp. 117-128.
 26. Trichet, J.-C., 2009. *The ECB's enhanced credit support.* Keynote address by Jean-Claude Trichet, President of the ECB at the University of Munich. Munich, 13 July 2009, (online). Available at: <https://www.ecb.europa.eu/press/key/date/2009/html/sp090713.en.html>.