

Challenges for Monetary Policy in the Euro Area

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Preface

The monetary policy of the European Central Bank is a current and highly debated topic. A lot of economists disagree with the course of the European Central Bank and debate about it in public. This bachelor thesis gives a brief overview of monetary policy during the financial crisis and the discussion about the latest actions of the European Central Bank. Economics students or other interested students can gain a first insight into recent monetary policy by reading this work.

First of all, I would like to thank Kerstin and my family for everything. Furthermore, I would like to thank Pablo, Mihaela, Max, Tobias, Edwin and Kasey. At last, I would like to express my gratitude to Prof. Dr. Scholl for great supervision.

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List of abbreviations

BVG = Bundesverfassungsgericht (German Federal Constitutional Court)

CEPR = Centre for Economic Policy Research

DIW = Deutsches Institut für Wirtschaftsforschung

ECB = European Central Bank

EMU = European Monetary Union

ESM = European Stability Mechanism

et al. = and others

FESSUD = Financialisation, Economy, Society and Sustainable Development (a project coordinated by the University of Leeds)

LOLR = lender of last resort

LTRO = long-term refinancing operations

OMT = Outright Monetary Transactions

QE = Quantitative Easing

1. Introduction

The financial crisis is a phenomenon which has never happened before in modern times. Unique about the recent financial crisis is the mix of a bank crisis and a sovereign debt crisis. The uniqueness displays not only a challenge for policymakers who have to handle with failing banks, weak economic conditions and high national debt, but also for monetary policy. In 2007, the financial crisis which had started in the US reached the banking sector in the euro area. To prevent a collapse of the whole financial system in Europe, the European Central Bank (ECB) injected large amounts of liquidity into the financial markets. The markets calmed down, and the economy recovered. However, in 2011, tensions in the sovereign bond market arose and states with high debt burden like Greece, Italy, and Spain (amongst others) faced insolvency. Again, the financial system was in danger to collapse, because the domestic banks of the crisis states were affected by the deteriorating creditworthiness of their national governments. Providing loans to the highly indebted countries was not a possible mean because monetary financing is prohibited according to Article 123, Treaty of Lisbon. Mario Draghi, president of the ECB, reacted to the new situation and announced in July 2012: *''Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough.''* (Draghi, 2012). His pledge was formalized by the Outright Monetary Transactions (OMT) program announcement two months later. A trade-off between acting legally within its mandate and taking effective measures to solve the crisis emerged for the ECB. The heated discussions about the actions taken by the ECB, especially about the mentioned OMT program and the Quantitative Easing measures, show how difficult it is to overcome the trade-off. Many economists criticize these actions as an overstepping of the ECB's mandate and doubt their effectiveness.

In the presence of illiquid banks and highly indebted countries, the ECB tries to conduct monetary policy in a way that its actions have positive effects on the financial markets on the one hand, and that they fall within the scope of the ECB's mandate to the contrary. The arisen challenge for monetary policy is outlined in this bachelor thesis.

In section 2, I describe briefly the ECB's monetary policy during the first and the second recession in the financial crisis. This section displays one challenge for monetary policy: the measures of the ECB are not as effective as intended in the crisis. By comparing the loan flows to the real economy, it turns out that the liquidity provision of the ECB had different effects in both recessions. Whereas the loan flows to the real economy declined cyclical in the first recession, their decline was abnormal in the second recession. For a

more detailed overview of monetary policy during both recessions, I recommend the narrative of Reichlin (2014).

The IS-LM model, illustrated in section 3, explains another challenge for monetary policy. Assuming the case that the euro area economy is caught in a liquidity trap, the model shows that monetary policy becomes ineffective.

Section 4 serves as an introduction into the most controversial monetary policy instruments: OMT and Quantitative Easing. This section provides a basic knowledge for the discussion part in the following section.

The discussion amongst economists about the latest measures and the role of the ECB during the financial crisis is summarized in section 5. This section outlines an additional challenge for monetary policy: some of the ECB's instruments are necessary and effective on the financial markets, but it is controversial if the actions are within the ECB's mandate. For example: OMT is perceived as monetary financing and conducting fiscal policy by the critics (see here especially Konrad (2013) and Weidmann (2013a)). In contrast, the proponents consider OMT as a necessary intervention on the sovereign bond market in order to restore the impaired monetary policy transmission channel (see here Fratzscher (2013)). Also the ECB's Quantitative Easing program is subject to discussion. The economists argue whether the euro area faces a deflation and need a Quantitative Easing program. After the debate on the monetary policy instruments, the ECB's role as lender of last resort during the financial crisis is scrutinized. There is a consensus in the discussion that the ECB's intervention during the financial crisis was important to prevent a collapse of the financial system. De Grauwe (2013) even comes up with the idea that the ECB could act as lender of last resort in the sovereign debt crisis, because the sovereign debt market is similar to the banking sector. Section 5 ends with a discussion about the future of monetary policy. There are two suggestions to secure financial stability in the future: either the ECB seeks a cooperation with fiscal policy or enhances its mandate by adding financial stability.

In the conclusion, I suggest adjustments of the ECB's mandate and criticize the missing alternatives of the critics to overcome the challenges for monetary policy.

2. The ECB's monetary policy during the euro area crisis

The crisis can be divided into two recessions. The first recession started in 2007 with a peak in 2008, after the fall of Lehman Brothers, and ended in 2009. This phase was followed by a short recovery until 2011 once the second recession started. Unlike the first

recession which also took place in the US, only the euro area was hit by the second recession, mainly due to tensions in the sovereign debt market (Reichlin, 2014).

Interesting to observe is that the liquidity provision of the ECB had different effects in both recessions.

2.1 Overview of monetary policy in the first recession

The reliance of banks on the interbank market as a funding source rose until the outbreak of the financial crisis (Gianonne et al., 2012). The interbank market is a network of international banks. They borrow and lend money from and to each other without financial supervision to manage their liquidity needs. However, after the collapse of Lehman Brothers, suspicion arose between the banks on the interbank market concerning the respective default risk. (Gianonne et al., 2012). Without a functioning interbank market, banks lacked an essential funding source. Liquidity scarcity spread over the markets which resulted in a cut of bank loans to the real economy and also could have had further breakdowns of financial institutions as a consequence.

Figure 2-1 illustrates this cut of bank loans to the real economy. Between 2008 and the end of 2009, the loan flows to non-financial corporations (NFC) decreased strongly and became even negative. The negative loan flows indicate that banks called in their loans. Important to note is here that banks loans are the primary source of corporate funding (Reichlin, 2014). Therefore, the real economy sustained also damage.

To avoid a crash of the financial system in the euro area and to mitigate the adverse effects on the real economy, the ECB intervened through non-standard monetary policy

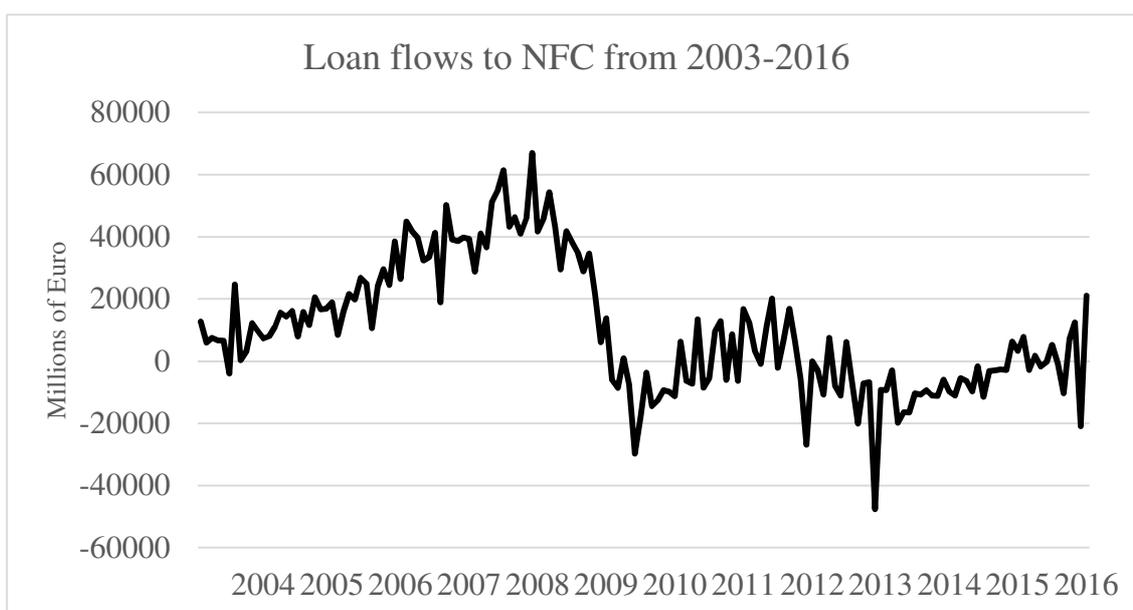


Figure 2-1: *Loans vis-à-vis euro area NFC reported by monetary financial institutions (MFI) in the euro area (transaction)*
Source: ECB

measures. Non-standard monetary policy measures deviate from the standard monetary policy instruments taken by the ECB until 2007. Briefly speaking, these standard measures (which are still in use) consist of setting interest rates, changing minimum reserve requirements for banks and conducting open market operations which are credit operations (with short maturity) against collateral. The necessity of non-standard measures arose, because standard instruments failed to be conveyed to the economy in an efficient way (Reichlin, 2014).

To solve the problem of liquidity scarcity on the markets, the ECB introduced so-called 'long-term refinancing operations' (LTRO), which were one of their non-standard instruments. LTRO was designed as repo¹ loans to banks at fixed rates against eligible collateral with a return horizon up to one year (in 2009). The goal of the liquidity provision was to increase the volume of bank lending, and indeed, LTRO positively influenced the amount of bank loans to the real economy (Reichlin, 2014). Also, Gianonne et al. (2012) found out, employing a VAR² model of the euro area economy, that the measures taken by the ECB influenced economic activity beneficially during this time. Hence, worse damage for the real economy was averted through LTRO. In addition, trading in the interbank market increased again, because banks had the opportunity to receive liquidity from the ECB in the case of short-term financing needs (Gianonne et al., 2012).

2.2 Overview of monetary policy in the second recession

The interbank market did not fully recover yet, and tensions on the sovereign debt market which were triggered by weak economic conditions and fiscal costs of the former bank crisis emerged. This tensions on the sovereign debt market were transferred to the banking sector, because many banks had been active in this market and their balance sheets contained a lot of sovereign bonds. Due to this circumstances, the ECB was induced to start new LTRO, even more offensive, with a longer return horizon up to three years (Reichlin, 2014). Again, LTRO should boost the number of bank loans to the real economy.

However, LTRO was not as successful as in the first recession. This fact becomes evident when figure 2-1 and figure 2-2 are compared. Figure 2-2 displays industrial production

¹The borrower sells assets to the lender and agrees to repurchase these securities at a specific point in time. In return, the borrower obtains a loan from the counterparty. This repurchase agreement (repo) is constructed like a collateralized loan. The intention of the borrower is to raise short-term capital.

²The vector autoregression (VAR) model is an econometric model.

and is an index chart (2010=100). Between 2008 and the end of 2009, industrial production declined strongly. In the same time, bank loans to the real economy (see figure 2-1) decreased strongly as well. Both declines are positively associated during the first recession. However, during the second recession, i.e. between the end of 2011 and 2013, industrial production dropped slightly and was only between 2012 and 2013 just under the industrial production level of 2010. However, the loan flows to NFC were not only negative but also decreased greater (with a large peak in 2013) than industrial production at the same time. The abnormal decline in bank loans to the real economy, despite large liquidity provision by the ECB, is also observed by Reichlin (2014).

Moreover, Reichlin (2014) states in her work that during the second recession, banks suffered solvency problems which were either not recognized or there were no means to solve the problem. Contrary to US banks which deleveraged early in the first crisis, euro area banks did not deleverage until the end of the second recession and were not recapitalized. She shows this fact with the banks' capital-asset ratios which are an indicator of solvency. The ratios were below the US banks' capital-asset ratios between 2008 and 2012. Many euro area banks were just too big for their home states to bail them out or to recapitalize them. Hence, insolvent banks were kept alive by the ECB's liquidity operations and thus, LTRO had not the effect as intended (Reichlin, 2014).

Besides, Gibson et al. (2014) observe a connection between the bank and sovereign crisis, a new feature in the financial crisis. On the one side, euro area banks which had a large

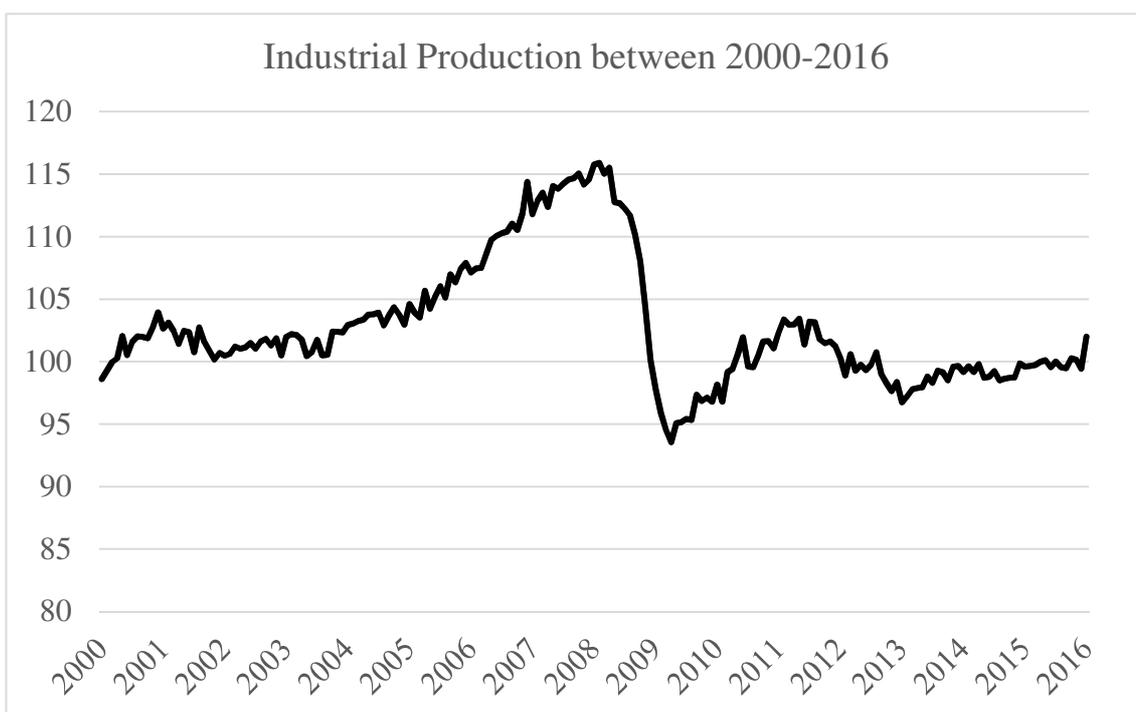


Figure 2-2: Industrial Production Index, Total Industry, 2010=100
Source: ECB

share of their home state's GDP exerted a dangerous influence on the fiscal policy of the respective state if their default risk was high. Because of that, a state could go bankrupted. On the other side, banks were sensitive to sovereign risk, because they held a large amount of mostly domestic bonds on their asset side (Reichlin, 2014). Government bonds were preferred by banks for several reasons: first, government bonds are considered to be safe assets in times of crisis. Even subsequent crisis countries were able to issue bonds at low interest rates as the ECB had treated debt of all euro area countries equally before the Greek sovereign crisis started (Gibson et al., 2014). Second, the bonds could be used as collateral for repo loans. After the outbreak of the Greek sovereign crisis, the ECB lowered collateral constraints and even accepted risky government bonds from crisis states (Reichlin, 2014). Additionally, Reichlin (2014) also observes a so-called 'home bias' which occurred only in the second recession, meaning that euro area banks held an increasing share of domestic bonds on their asset side, whereas the proportion of non-domestic bonds declined. She assumes that governments, especially those with fiscal problems, convinced domestic banks to buy bonds issued by the own government. Thus, banks in crisis countries faced a higher bank risk. Third, banks may hold more government bonds to be liable to lower capital requirements (according to the Basel risk-weighted asset rules) (Reichlin, 2014).

The ECB failed to achieve its intended goal of LTRO, but the liquidity provision also had a positive effect: the injected liquidity stabilized the financial system in both recessions and helped countries to raise funds, because banks used the additional liquidity to buy government bonds during the second recession.

2.3 Why had monetary policy different effects in both recessions?

The main difference between the first and second recession is the abnormal decline in loans to real economy in the second recession, although the ECB injected huge amounts of liquidity into the banking sector in both recessions.

A possible explanation could be the forfeit recapitalization of the banks. LTRO were not an appropriate mean to solve the solvency issues banks had and therefore, insolvent institutions became dependent on the ECB's liquidity operations. Weakly capitalized banks built up reserves instead of increasing their credit supply with the obtained liquidity (Reichlin, 2014). The reliance of insolvent institutions on the ECB could be dangerous in the future, because at some point in time, the ECB will stop its liquidity program. What

will happen with the insolvent institutions? There is a potential danger for another bank crisis.

Another reason for the abnormal decline of loans might be the fact that banks with a large share of government bond holdings on their asset side experience a higher bank risk due to the sovereign crisis and shorten their credit supply (Constâncio, 2014). Additionally, banks were able to use government bonds (even from risky states) as collateral for LTRO. Instead of increasing the loan flows to the real economy, banks acquired government bonds to raise their amount of eligible collateral for the ECB's repo loans.

It seems that LTRO was more helpful for the crisis states than for the euro area economy during the second recession.

3. A theoretical framework- the liquidity trap

The situation during the second recession is reminiscent of the standard textbook IS-LM model in which the economy is caught in a liquidity trap. Of course, the IS-LM model is a simplified version of the real world, but it can show which challenge monetary policy faces at the moment.

First, a summary of how the IS-LM model works: In general, an increase in the money supply (a shift of the LM-curve to the right) leads to a decrease in the interest rate r which stimulates economic growth in turn (a new equilibrium Y is formed). An economy caught in a liquidity trap is illustrated in figure 3-1. The LM-curve is flat, meaning that the demand for money is interest-elastic and does not react to changes in the income. Every additional unit of income is saved. Even expansionary monetary policy (a shift from LM_1

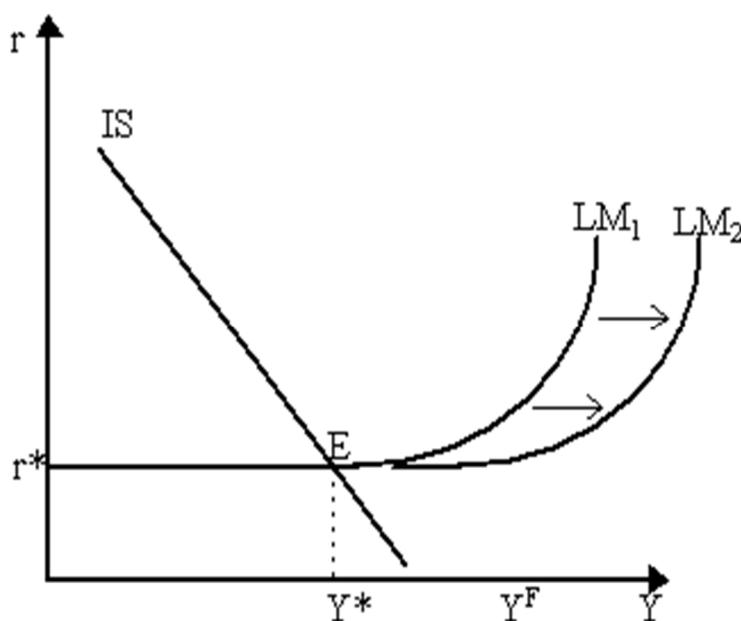


Figure 3-1: The liquidity trap

Source: Wong (2013)

to LM_2) cannot decrease the interest rate r furthermore, and a new output equilibrium Y cannot be obtained. Distinctive for an economy in a liquidity trap is that interest rates are already close to zero. Investments are not profitable, and people are stockpiling cash, because they expect an extraordinary economic event like a recession or

deflation, for instance. Banks do not increase the amount of bank loans, but instead they build up their reserves to be prepared for bad times. Thus, conventional monetary policy measures are ineffective. Only a shift of the IS-curve (i.e. expansionary fiscal policy) can lead to a new output equilibrium Y .

Is the euro area economy in a liquidity trap? The first indicator for a liquidity trap is an output gap which is the difference between actual output and potential output. The European Commission specifies the output gap around -2.9% of GDP for the euro area in 2013 (Société Générale, 2013).

As explained before, monetary policy is ineffective due to almost-zero interest rates. In 2012, the interest rate for main refinancing operations (ECB provides liquidity to banks with a maturity of one week at this rate) fell below 1% , namely 0.75% , and converged to 0.00% in 2016. Moreover, the marginal lending facility (the rate at which the banks can borrow money from the ECB overnight) fell from 1.5% to 0.25% in the same period (ECB, no date-b).

In section 2.2, I describe the abnormal decline in bank loans to the real economy from 2011 onwards which is another indicator for a liquidity trap. The financial system obtained a massive liquidity injection, but the banks hoarded cash and built up excess reserves instead of enhancing their credit supply.

Obviously, there are indicators for the hypothesis that the euro area economy is caught in a liquidity trap. From this, it could be concluded that the ECB might not only focus on monetary policy but also try to coordinate it with fiscal policy to stimulate economic growth. I will further explain this in section 5.4.

4. The current monetary policy of the ECB

Section 2 provides a brief review of monetary policy between 2007 until 2012. However, after 2012, the situation on the financial markets was still tensed. The ECB introduced new measures to mitigate the tensions on the sovereign bond market (i.e. OMT) and to oppose the deflation threat in the euro area (i.e. Quantitative Easing). Both measures are the most controversial actions of the ECB and are outlined in this section to provide a basic knowledge for the following discussion part in section 5.

4.1 Outright Monetary Transactions

The ECB adopted a measure called 'Outright Monetary Transactions' (OMT) in 2012. The OMT program involves unlimited purchases of sovereign bonds of crisis countries

on secondary markets³. In turn, these specific crisis countries have to apply for help within the ESM program. The intention of OMT is to lower interest rates on crisis states' sovereign bonds (ECB, 2012). After the outbreak of the financial crisis, the interest rates on government bonds of highly indebted countries raised, whereas the yield on government bonds of 'safe' countries (e.g. Germany) kept on a low level. An interest spread arose in the sovereign bond market. Through lower interest rates, crisis states would be able to borrow money at lower costs again.

The OMT program has not been conducted, but it helped to calm the financial markets at this time (Wallace, 2016, p. 192).

4.2 Quantitative Easing

The Quantitative Easing (QE) program (also called 'expanded asset purchase program') was announced in January 2015 and consists of three different measures: third covered bond purchase program (CBPP3), asset-backed securities purchase program (ABSPP), both were already implemented in October and November 2015, and public sector purchase program (PSPP) which was added in January 2015.

Within CBPP3, covered bonds from euro area banks are purchased with the goal of supporting bank lending to the real economy and securing monetary policy transmission. Asset-backed securities are generated when banks transform loans into securities which they sell. These securities are bought within the ABSPP, which aims to stimulate the issuance of new securities. In this way, banks obtain funding which can be used to provide credit to the real economy.

Public sector securities, which include government bonds, bonds from European institutions and bonds from multilateral development banks, are purchased within PSPP. The acquired securities are available for securities lending which has the goal to support market liquidity and collateral availability.

These QE measures are designed to oppose the deflation threat in the euro area and to shift the inflation rate towards 2% (inflation goal of the ECB) (ECB, no date-a).

5. Controversy over the ECB's monetary policy and its mandate

The ECB's monetary policy is debated passionately, especially in Germany, concerning the question if the ECB acts within its mandate. This section provides an overview of

³ A secondary market is a market where entities buy financial assets, e.g. debt instruments, from other entities instead of the issuing institution. In contrast, the primary market is a market where entities buy financial assets, e.g. debt instruments, directly from the issuing institution.

arguments in favour and against the way how the ECB conducted monetary policy and discusses the future of the ECB's mandate.

5.1 OMT: monetary financing or a necessary monetary policy instrument?

First, one should be aware of the ECB's mandate to understand the following discussion. The mandate is defined in the Treaty of Lisbon, Article 127: *'' The primary objective of the European System of Central Banks (referred to as "the ESCB") shall be to maintain price stability. [...] The ESCB shall act in accordance with the principle of an open market economy with free competition, favouring an efficient allocation of resources, and in compliance with the principles set out in Article 119. [...] The ESCB shall contribute to the smooth conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system.''*⁴ Additionally, the ECB defines price stability as following: *'' Price stability is defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%.''* (ECB, no date-c).

Weidmann (2013a) considers the purchase of government bonds on the secondary market as an eligible monetary policy instrument to provide liquidity to financial markets. But he criticizes the ECB's intention behind the OMT program to reduce risk premiums on government bonds of particular countries. In more detail, when the ECB purchases government bonds of selected countries (i.e. of crisis states which also accepted the conditions of ESM) on the secondary market, the interest on these government bonds decreases. Due to the tight linkage between the secondary market and the primary market, the selected countries can issue their bonds at lower costs on the primary market. Their interest payments decline what relieves the respective government budget (Konrad, 2013). Uhlig (2013) declares the described mechanism as monetary financing. In the view of the critics, the ECB oversteps its mandate which consists only of price stability, and it violates Article 123 of the Treaty of Lisbon (prohibition of monetary financing). Keeping the legal aspect on OMT, the German Federal Constitutional Court judged that the OMT program is not in the scope of the mandate and the ECB rather conducts economic policy, because it makes monetary policy only for selected countries and not for all member states (BVG, 2014).

Besides the legal aspects, the critics accuse the ECB of intervening unnecessarily in the government bond market. The ECB's argument for OMT (amongst other reasons) was

⁴ ESCB denotes the system of ECB and all national central banks in the euro area. ESCB and ECB are used interchangeably for simplicity.

that the high-risk premiums on government bonds of specific countries (i.e. Spain, Italy, and Greece) are not rational because they are based on the expectation that the European Monetary Union (EMU) breaks down. But the ECB considers the EMU as irreversible. With OMT, the ECB would intervene in a dysfunctional market and remove the irrational part of the risk premiums on government bonds (Asmussen, 2013). However, Fuest (2013) is not convinced by this argument and argues that it is not the task of the ECB to correct expectations on the capital market. In his opinion, the high-risk premiums on the government bonds are rather based on the expectation of a haircut of the crisis countries without an exit from the EMU. The high interest on government bonds from crisis states can also be explained by their fiscal problems (Sinn, 2014). Through the intervention, the ECB would create distortions in the sovereign bond market as the interests represent market signals (Uhlig, 2013). Following this argumentation, the OMT program violates the ECB's mandate which states that the ECB should comply with the principles of an open market economy. Distorting market prices is not a principle of an open market economy. Moreover, Konrad (2013) considers the sole announcement of OMT as a violation of the ECB's mandate. The announcement changed the expectations of market participants because the ECB guaranteed that no country would go bankrupted. As a consequence, the interest on the government bonds of the crisis states went down which led to smaller interest payments for these states.

In addition, the assertion of conducting fiscal policy comes up. The issued guarantee by the ECB is fiscal policy and not monetary policy (Sinn, 2014). Fuest (2013) also regards OMT as fiscal policy, because the ECB just wants to secure the access of the crisis states to the capital market. Both cannot see any monetary policy motivation behind OMT. Sticking to the argument that the ECB conducts fiscal policy, (Weidmann, 2013a) recognizes a potential risk for the ECB: mixing monetary policy with fiscal policy and acting as a player on the sovereign bond market bears the risk to weaken the ECB's credibility as a maintainer of price stability and thereby, the ability to pursue its mandate. A suggestion for a legal implementation of OMT is proposed by Weidmann (2013a) and Uhlig (2013). Because of the fiscal nature of OMT, it should be conducted by the ESM which has the mandate for fiscal programs.

The critics had economic and legal objections, but why did the ECB announce OMT nevertheless? Asmussen, member of the Executive Board of the ECB, explained during a court hearing in front of the German Federal Constitutional Court in 2013 that the ECB had seen a risk for price stability in the euro area due to the decline in economic activity

and credit provision. With the OMT program, the ECB sought to stabilize the economic environment and restore the monetary policy transmission channel to pursue its mandate (Asmussen, 2013). Evidence for an impaired monetary policy transmission can be found by considering the abnormal decline in credit provision to the real economy as described in section 2.2. Moreover, decreasing interest rates did not influence expectations in the financial markets. For instance, the main refinancing rate accounted for 0.75%, whereas the yield on Spanish two-year bonds was 6.6% (Asmussen, 2013).

The sovereign bond market is an important transmission channel for monetary policy and indicates the supply of credit provision to the real economy as well as the prices of loans. Thus, the functioning of this market is indispensable (Fratzscher, 2013). During the trial, Asmussen (2013) resists the accusation of monetary financing and explains that the ECB never intended to decrease the interest spread on the sovereign bond market. As mentioned before, the ECB wanted to eliminate irrational expectations on the sovereign bond market with OMT and maintain financial stability hence. The reaction of the markets to the announcement of OMT supports the thesis that part of the high-risk premiums on government bonds were due to irrational expectations (Fratzscher, 2013). An objection to the German Federal Constitutional Court's verdict is the following argumentation: Indeed, OMT is an asymmetric intervention on the government bond market, but a decrease in interest rates is also asymmetrical, because lower interest rates are not always beneficial to the same extent for all euro area members, for instance. Improving transmission channels through OMT should secure monetary policy for all members to the same extent though (Fratzscher, 2013).

Additionally, purchasing government bonds on the secondary market is a conventional monetary policy instrument. Every monetary policy measure has fiscal consequences (Uhlig 2013) and is not always monetary financing.

At the end of the court hearing, Asmussen (2013) concludes that the sole announcement of OMT showed the positive effects of the program on the sovereign bond market. Interest on government bonds of crisis states declined, and economic conditions in these states improved. Without such a program, the situation on financial markets could be much worse.

The ECB had to react to the increasing risk of sovereign default which would have led to turmoil on the financial markets again. It introduced OMT which has not conducted yet, but the announcement calmed the financial markets and improved the monetary transmission channel on the sovereign bond market. The challenge for monetary policy

is at this point that the ECB still sticks to its mandate despite the effectiveness of the monetary policy instrument. Conducting OMT could be a violation of the mandate. The critics made legal and economic objections which have to be taken into consideration.

5.2 Quantitative Easing- an effective measure to oppose the deflation risk?

The Quantitative Easing (QE) program is a large asset purchase program with the goal to lower interests on financial markets. As a result, private consumption and investments are stimulated which triggers economic growth in return. With QE, low inflation should be opposed (Bernoth et al., 2015).

Again, Bundesbank president Jens Weidmann belongs to the critics of the ECB's monetary policy. He argues that the drop in the oil price is the main driver of the decline in the inflation rate and that the low inflation is only of temporary nature. Rather, the drop in the oil price can be regarded as a stimulation for the economy, because it increases the consumer's purchasing power and decreases the costs of firms. In his opinion, the euro area economy does not face a deflation, because indicators are missing for that like falling prices and wages. The European Commission projects an increase in wages by 1.3% in the euro area for 2015 and long-term inflation expectations are stable. Even the ECB expects an inflation rate of 1.5 % in 2016 (Weidmann 2015). Weidmann obtains support from the former ECB's chief economist, Otmar Issing, who assesses the low inflation rate as a correction mechanism in crisis states whose wages and price levels have been too high in the recent years. This can be a chance for them to strengthen their competitiveness in the euro area (Issing, 2015).

Weidmann (2015) and Issing (2015) see no reason to implement QE, because the euro area does not face a deflation. QE rather bears the risk of moral hazard on the part of the crisis states which have fewer incentives to consolidate their budgets due to lower interests on their issued bonds. In this way, the ECB will have more difficulties in pursuing its mandate of price stability (Weidmann, 2015).

Bernot et al. (2015) highlight further reasons for the decline in inflation in the euro area, i.e. the weak competitiveness of Southern Europe and the fiscal austerity in the crisis states. They conclude that QE will only have a limited effect on the real economy because the factors which are responsible for the decline in inflation can be partly influenced by monetary policy. Additionally, interests on government bonds of crisis states decreased since 2013, and further stimulation of the real economy by lowering interests on their bonds is unlikely. The weak credit demand of the real economy in crisis states due to their

fiscal austerity policy is another factor for the limited effect of QE. The firms in those states do not want to invest and the households' purchasing power is reduced through higher taxes. But despite all drawbacks, Bernot et al. (2015) see QE as the only mean of the ECB to oppose the deflationary pressure prevailing in the euro area.

Figure 5-1 displays the inflation rate in the euro area. It shows that the deflationary pressure continues. The inflation rate accounted for -0.2% in February, 2016. Weidmann (2015) is right when he argues that the low inflation is a result of the drop in the oil price, but he does not seem to be right that the low inflation is only temporary. Figure 5-1 illustrates that the inflation moved around 0% since 2015, despite the implemented QE measures. This raises the question: Would be inflation much lower without QE? Also the ECB corrected its expectations and projected an inflation rate of 0.1% in 2016 and 1.3% in 2017 (Draghi and Constâncio, 2016). In contrast to Weidmann's (2015) opinion, the ECB had to react to the low inflation, because its mandate includes an inflation rate of 2% per year.

The same is concluded by Fritsche and Tassow (2015). In order to restore its credibility as maintainer of price stability, the ECB has to conduct QE as a mean against the deflation threat. In contrast to Weidmann (2015) and Issing (2015), Fritsche and Tassow (2015) recognize a risk of deflation in the euro area. They support their argument by analyzing the distribution of price changes across all product categories (in a second analysis they excluded food and energy) which are used to calculate the consumer price indices. They found out that a large fraction of the product categories face falling prices in Southern Europe. It is more a general price decline than a decline in relative prices triggered by low oil prices (Fritsche and Tassow, 2015). According to Fritsche and Tassow (2015), the

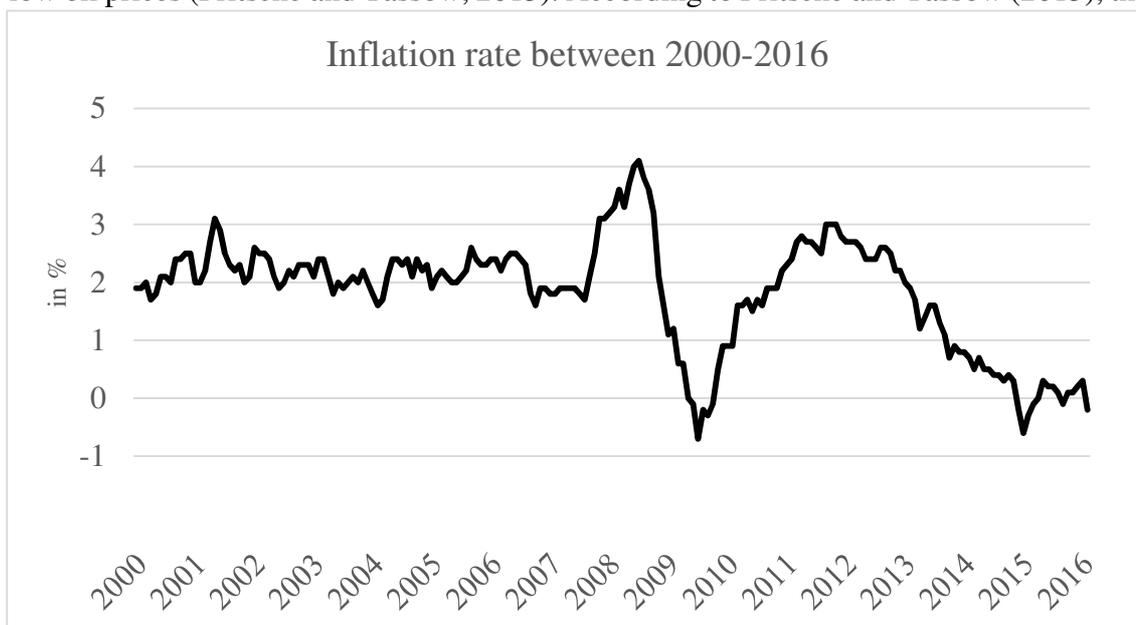


Figure 5-1: HICP - Overall index, Annual rate of change

Source: ECB

price decline in Southern Europe did not occur in 2009 when the euro area experienced a deflation (see figure 5-1) for the first time and overcame the situation without QE. Obviously, deflation is already present in parts of the euro area and a laissez-faire attitude, as suggested by Weidmann (2015) and Issing (2015), would violate the ECB's mandate. Further indicator for deflation showed up in the European Commission household survey, analyzed by Fritsche and Tassow (2015), where they point out that inflation expectations of consumers declined since 2013.

The prediction of Bernot et al. (2015) that QE will only have a limited impact on the real economy turned out to be true. On March 10th, 2016, the ECB announced an expansion of the QE program. The ECB justified the step with the slow growth of the real economy in the euro area and lasting low inflation rates. Further monetary stimulus seems to be necessary to reach the ECB's inflation target (Draghi and Constâncio, 2016).

The ECB's obligation to intervene is derived from its mandate of price stability and QE is a suited mean to oppose deflation. But this section also shows which challenge monetary policy faces at the moment. Its effectiveness is limited and it can partly influence economic activity.

5.3 The ECB's role as lender of last resort

'Lender of last resort' (LOLR) is an old concept in central banking history. It denotes an entity, mainly a central bank, which provides liquidity to a solvent but illiquid institution in the case that liquidity scarcity spreads over the financial markets. The goal is to avoid bank runs and preserve financial stability.

Considering the explanation above, the actions taken by the ECB during both recessions look quite similar to the task of an LOLR: provide liquidity in stressed times and prevent a collapse of the financial system thereby. Hence, it is possible to argue that the ECB fulfilled the role of an LOLR during the financial crisis, although the ECB itself has never admitted this role officially, because it is not included in the mandate.

A central bank acts as an LOLR due to following reasons (Bindseil, 2014, p. 237ff.): First, an illiquid bank which has not access to the markets anymore tries to obtain liquidity by asset fire sales⁵, but the probability of a default triggered by illiquidity is high without further funding sources. In times of liquidity scarcity on financial markets, a lot of financial institutions are close to illiquidity what endangers the stability of the whole

⁵ An asset fire sale denotes a sale of an institution's assets below the market value to obtain quickly liquidity. If several institutions conduct an asset fire sale, the asset values spiral downwards.

banking sector. Second, only a central bank has superior market knowledge in comparison to other market participants. Third, a central bank might reduce its expected losses by being supportive. A supportive policy preserves financial stability and avoids large write-downs on the central bank's assets. It is even possible that the central bank realizes profits after a financial crisis when the prices of the assets in its balance sheet go up again.

This shows why the ECB took on the role as an LOLR. It had the means (i.e. LTRO) and is the only institution with superior market knowledge on the market. Additionally, the ECB was interested in minimizing its losses in the financial crisis, because its stakeholders are the euro area states (thus, losses affect the taxpayers). The beneficial effect of LTRO is pointed out by Reichlin (2014) and Gianonne et al. (2012) (see section 2.1). Until today, the financial system is still working and has not collapsed due to the intervention of the ECB.

Despite the important role of LOLR in the financial system, its drawbacks also have to be taken into consideration, especially the risk of moral hazard. Banks anticipate ex-ante the possibility of an LOLR in stressed times and bear bigger liquidity risks (Bindseil, 2014, p. 265). Before 2007, the trading with decayed subprime credits, partially with the knowledge that they were of low creditworthiness, is a good example of the risky behavior of banks. A further drawback is that the consequences of liquidity crises as recession and distortion of the monetary policy transmission channels still occur despite the intervention of an LOLR (Bindseil, 2014, p. 265). This has been seen in 2011 when the second recession started. The ECB injected a huge amount of liquidity into the financial markets through LTRO, but however, an abnormal decline in bank loans to the real economy was observed. Obviously, the transmission channel of monetary policy was impaired. There is also a good chance that a supportive central bank policy during a crisis could lead to another crisis in the future (Farhi and Tirole, 2012, in: Bindseil, 2014, p. 266). Finally, Cukierman (2013) raises the concern that a large amount of liquidity on the markets together with low-interest rates could lead to a strong increase in inflation after the financial crisis unless this liquidity is absorbed. The risk of exceeding the inflation target of the ECB exists.

According to Bindseil (2014, p. 161), the solution to the high debt problem of some states is a central bank acting as an LOLR for the crisis states. This point of view is supported by De Grauwe (2013) who also states that the missing LOLR in the EMU is a cause for the arisen tensions in the sovereign bond market. He compares the sovereign bond market with the banking system and shows the similarity: if one country is doubted to be solvent

(e.g. Greece), uncertainty concerning the solvency of other states with high debt spreads over the sovereign bond market. Investors only want to invest in safe government bonds (e.g. from Germany) and the interest rates on the bonds of highly indebted countries are on the rise. Thereby, the debt burden of these countries also climbs until they are insolvent (De Grauwe, 2013). The same happened in the interbank market in 2007 when the financial crisis started, and uncertainty about the banks' respective default risk emerged. The ECB intervened with LTRO. De Grauwe (2013) claims that states also need an LOLR in order to be rescued from insolvency. Additionally, governments possess solely illiquid assets, mainly future tax payments, and are not able to turn them into a liquid asset to repay their debt. Therefore, it is necessary for states to have a source of liquidity (Buiter and Rahbari, 2012). If the central bank fails to act as an LOLR in the sovereign bond market, it has to be the LOLR for the banks in the crisis states eventually (because of the linkage between sovereign debt crisis and bank crisis, see section 2.2). This would be more expensive for the LOLR because the banking sector's liabilities are larger than the liabilities of the corresponding government (De Grauwe, 2013).

When the countries joined the euro, their national banks lost the function of an LOLR, not only for banks but also for the respective state (Wallace, 2016, p. 189), because the national central banks were under the supervision of the ECB then. One might raise the question: should the ECB take on the role of LOLR in the sovereign bond market?

Pisani-Ferry (2012) argues that the ECB has no mandate for it. Changes in the mandate are required for this step, e.g. include financial stability as an objective beside price stability. In addition, he argues that the ECB would have no means to prevent moral hazard (i.e. the crisis states delay the necessary budget consolidation) and could lose its independence. Issing (2012) also recognizes the threat of loss of independence. A classical LOLR provides liquidity to solvent institutions; a country is insolvent if it cannot repay its debt with tax payments. Thus, a central bank acting as an LOLR rather risks to become dependent on national governments (Issing, 2012). A dependency on national governments would imply that a central bank conducts monetary policy for fiscal policy and focuses on stabilizing the countries' real debt burden, not on maintaining price stability. This is called fiscal dominance (Weidmann, 2013b). A negative example of a central bank which acted as an LOLR for a government is Banca d'Italia. During its time acting as an LOLR (1975-1981), Italy's debt burden tripled, and inflation accounted for 17% (Weidmann 2012).

According to De Grauwe (2013), the ECB should take on the role of LOLR in the sovereign bond market to which it already committed by announcing OMT in 2012. A

risk of inflation, like Weidmann (2012) described in his Banca d'Italia example, is not necessarily existent in his point of view. He explains that purchases of government bonds increase the money base⁶, but do not have to lead to an increase in the money stock⁷ (M3). In normal times, an increase in the money base leads to an increase in M3, but the relationship between both aggregates can break down in times of crisis. A good example for this disconnection is the ECB's LTRO, which had no influence on M3 (De Grauwe, 2013). Cukierman's (2013) concern that inflation might rise after the financial crisis due to the large amount of liquidity in the financial markets is true, but the ECB can withdraw liquidity by selling their bonds in its balance sheet or just increases minimum reserve requirements for banks. Furthermore, De Grauwe (2013) admits that the ECB accumulates risky assets in its balance sheet and could make losses hence. But the ECB could also make losses if it buys private papers. Moreover, if the ECB's intervention in the sovereign bond market is successful and rescues a country from insolvency, its balance sheet improves, because the bond prices will increase. This point was also made by Bindseil (2014, p. 265).

As described before, LOLR creates moral hazard. Despite this drawback, the importance of LOLR for the banking sector would not be denied. De Grauwe (2013) raises the question why LOLR in the sovereign bond market should be abandoned due to the risk of moral hazard. In contrast to Pisany-Ferry (2012), De Grauwe (2013) states that the ECB has means to prevent moral hazard, e.g. to attach the condition of applying for help to the ESM in order to obtain help through OMT. The moral hazard problem which is created by the LOLR function of the ECB can be also mitigated by establishing a supervision which could be taken over by the European Commission. De Grauwe (2013) disproves Issing's (2012) argument that an LOLR in the government bond market provides liquidity to insolvent countries with the argument that OMT was attached to the ESM; thus, only solvent countries would obtain liquidity from the ECB. Another positive aspect is that acting as an LOLR gives countries time to restructure its debt and recapitalize its banks (Buiter and Rahbari, 2012). That helps to stabilize the financial system.

The ECB has not acknowledged its role as LOLR officially, probably because of the prohibition of monetary financing, stated in Article 123, Lisbon Treaty (Buiter and Rahbari, 2012). But the ECB can provide liquidity without limits and therefore, it is the

⁶ The money base includes currency in circulation and deposits of commercial banks with the central bank and is part of the money stock.

⁷ The money stock includes all monetary assets in an economy. A growth in M3 is an indicator for inflation in the medium and the long run.

sole institution which can act credibly as an LOLR in the sovereign bond market (De Grauwe, 2013). The IMF and the ESM are not suited to be an LOLR due to their limited ability to provide liquidity (Buiter and Rahbari, 2012). An alternative LOLR could be the ESM with access to ECB funding (Illing and König, 2014).

The LOLR role of the ECB in the banking sector was successful in the first and second recession, because it preserved the financial stability. But it has to be taken into consideration that the LOLR role is not in the mandate of the ECB.

De Grauwe (2013) argues that an LOLR for the euro area states could help to master the sovereign debt crisis. The ECB indirectly took on the role of an LOLR for the crisis states by announcing OMT. As described in the previous section, the announcement had positive effects on the financial markets, but a further commitment to LOLR activities in the sovereign debt market harbours legal obstacles, i.e. the prohibition of monetary financing and the missing mandate for an LOLR. This represents a challenge for monetary policy, because presumed effective measures cannot be implemented due to a missing legal framework.

5.4 The future of monetary policy

The crisis showed up the fact that standard monetary policy is not effective in stressed times. Maintaining price stability when the financial system faces a collapse is not possible as described in section 2.1. Financial stability enables pursuing price stability, and price stability contributes to financial stability. There are two suggestions to achieve both goals: either a coordination of fiscal and monetary policy or an enhancement of the ECB's mandate by establishing financial stability as an objective beside price stability. Going back to section 3: The IS-LM model displays how fiscal policy and monetary policy influence an economy's output. When the economy falls into a liquidity trap, monetary policy becomes ineffective, and a new output equilibrium can be only obtained by fiscal policy (a shift in the IS curve). I found indicators that the euro area economy fell into a liquidity trap. Hence, it is legitimate to argue that the ECB might not only focus on price stability, but also coordinates its measures with fiscal policy to stimulate economic growth. Economic growth is a prerequisite for reducing public debt. And sound public finances enable monetary policy to secure price stability (Weidmann 2013b). A cooperation of fiscal and monetary policy is also advocated by Fratzscher (2013) in order to preserve financial stability. He concludes that the need for cooperation can be derived from the fact that the ECB attached OMT to the ESM program. Another indicator for the

need of cooperation is provided by the theoretical findings of monetary theory which point out that price stability is also influenced by expectations about future expenses of the government (Illing and König, 2014).

But a coordination of monetary policy and fiscal policy has potential risks for the ECB, i.e. a loss of independence and an impairment of its credibility (Issing, 2012). Again, it exists the risk of fiscal dominance (the concept is described in the previous section) and the ECB ventures to lose track of price stability. According to Issing (2012), the ECB should avoid such a cooperation and pursue its mandate solely. Thus, it will contribute to the society's welfare in the long term. On the contrary, Bindseil (2014, p. 296) disagrees with the point that a central bank risks its independence with this cooperation. He rather sees a chance for the central bank to conduct successfully monetary policy through the cooperation with fiscal policy.

The relationship between price stability and financial stability is described above and might raise the question if the ECB should establish financial stability as primary objective beside price stability. However, financial stability is only a secondary goal of the ECB (see the definition of the ECB's mandate in section 5.1). According to Bindseil (2014, p. 295), a central bank cannot only pursue one goal in times of liquidity scarcity in the markets, because it has to take all economic and financial circumstances into consideration. Considering monetary policy during the crisis, it seems that Bindseil is right because the ECB pursued not only price stability but also financial stability. The ECB's role of LOLR during the first and second recession served clearly the goal of financial stability. Also, Reichlin (2014) assesses the ECB's monetary policy as an attempt to preserve financial stability during this time. Including financial stability into the mandate of the ECB could serve as a prerequisite for the role of an LOLR in the sovereign bond market as proposed by De Grauwe (2013). Thus, the ECB would have the possibility to implement further effective means to overcome the sovereign debt crisis. Besides, other major central banks like the Fed and the Bank of England already ranked financial stability equally to price stability in their mandates (Cukierman, 2013).

Issing (2012) points out the potential conflicts between financial stability and price stability. A mandate of financial stability would include supervision and regulation and thus, interaction with other financial institutions. The ECB's independence would be weakened. Furthermore, the central bank's communication policy which is important to maintain credibility becomes more complex through including financial stability into the mandate and would impair credibility hence. Due to these reasons, the ECB should only

pursue price stability (Issing, 2012). Weidmann (2015) supports Issing (2012) and states that financial stability and price stability are related but have different objectives. An example illustrates the potential conflict between both goals: Macroprudential policy⁸ as an instrument to secure financial stability could limit bank lending to reduce risks in times of crisis, whereas monetary policy would like to increase lending to maintain price stability at the same time (Weidmann, 2015). But the concerns of both economists might be unjustified, because research has already found solutions to potential conflicts between both objectives (Cukierman, 2013).

The expansion of the QE program announced on March 10th, 2016 shows that the previous QE measures had limited effects on the real economy and the inflation. Already Bernoth et al. (2015) pointed out in section 5.2 that QE would have limited effects, because the factors which are responsible for the low inflation rate can be partly influenced by monetary policy. This implies a need for the cooperation between fiscal and monetary policy. The need for that is also recognized by the ECB. When Draghi and Constâncio announced the expansion of QE, Draghi requested the euro area states to conduct fiscal policy in a way such that it supports economic growth in the euro area (Draghi and Constâncio, 2016).

Furthermore, the Single Supervisory Mechanism (SSM) was established in 2014 and takes over the supervision of significant banks in the euro area. The SSM is affiliated with the ECB. Despite the strict separation of monetary policy and macroprudential policy within the ECB, this step can be interpreted that the ECB is willing to take over responsibility for financial stability like the Fed and the Bank of England.

Both developments might imply that the ECB seeks new ways to overcome the challenges which it faces at the moment.

6. Conclusion

The challenge for monetary policy which arose during the financial crisis is the trade-off between acting legally within the scope of the ECB's mandate and taking effective measures to influence financial and economic conditions. First, I provided a brief overview of monetary policy between 2007 and 2012. During both recessions, the ECB injected a huge amount of liquidity into the financial markets through LTRO in order to

⁸ Macroprudential policy is a consequence of the financial crisis and includes tools which aim to prevent that single dysfunctional markets lead to a collapse of the whole financial system. Banking supervision is an example for a macroprudential tool.

boost the loan flows to the real economy. The challenge for monetary policy which is outlined in section 2 is that LTRO had not the effect as intended in the second recession. Whereas the bank loans to the real economy decreased cyclical during the first recession, their decline occurred abnormal during the second recession.

Afterwards, I found indicators for the hypothesis that the euro area economy is caught in a liquidity trap. Applying the IS-LM framework, it turns out that monetary policy is ineffective in such a case and only fiscal policy can stimulate economic growth furthermore. This finding implies a cooperation between monetary and fiscal policy. The discussion part in section 5 serves to organize arguments which are against and in favour of the actions of the ECB and its role during the financial crisis. The section outlines several challenges for monetary policy: First, OMT seems to be an effective instrument to restore the monetary policy transmission channel on the sovereign bond market. Its announcement illustrated the potential positive effects which it could have on the financial markets. But the program might be a violation of the mandate of the ECB. Second, QE was introduced to oppose the deflation threat in 2015. But the low inflation is a result of factors which can be partly influenced by monetary policy. Thus, QE had only limited effects yet and was expanded in March, 2016. Third, the missing mandate for acting as an LOLR. During the financial crisis, the ECB preserved successfully the stability of the financial system. Furthermore, acting as an LOLR for national governments could be the solution to overcome the sovereign debt crisis. But the ECB does not have the mandate for fulfilling both roles. It would require adjustments of the mandate for that. Finally, section 5 closes with two suggestions for future monetary policy: a cooperation between monetary policy and fiscal policy and an enhancement of the ECB's mandate by adding financial stability. The latest actions of the ECB indicate that it might follow both suggestions.

The problem of the ECB is that their measures are either in their mandate but have limited effects or it is not clear if the measures are in the ECB's mandate but they are effective and improve the situation on the financial markets. In my opinion, it might be necessary to draw lessons from the financial crisis and to think about adjustments of the ECB's mandate. Effective measures like OMT or the LOLR function in times of crisis cannot be implemented due to a missing legal framework. Adjustments are not easy to make, because it requires changes in the Treaty of Lisbon. And changes are only executed if all EU member states agree with that. In addition, the whole discussion lacks detailed alternatives of the critics to overcome the challenges for monetary policy. The critics hide behind legal arguments instead of coming up with own plans.

7. Reference List

- Arestis, Philip (2014): *Current and Future ECB Monetary Policy*. Working paper series no. 28, FESSUD.
- Asmussen, Jörg (2013): *Introductory statement by the ECB in the proceedings before the Federal Constitutional Court*. Available at: <http://www.ecb.europa.eu/press/key/date/2013/html/sp130611.en.html> (Accessed: March 25th, 2016).
- Bernoeth, Kerstin/König, Philipp/Raab, Carolin/Fratzscher, Marcel (2015): ‘Unbekanntes Terrain: Anleihekäufe der Europäischen Zentralbank’, *DIW Wochenbericht*, vol. 82, no. 13, pp. 307-316.
- Bindseil, Ulrich (2014): *Monetary Policy Operations and the Financial System*. Oxford: Oxford University Press.
- Buiter, Willem H./Rahbari, Ebrahim (2012): *The ECB as Lender of Last Resort for Sovereigns in the Euro Area*. Discussion Paper no. 8974, CEPR.
- Bundesverfassungsgericht (2014): *Hauptsacheverfahren ESM/EZB: Urteilsverkündung sowie Vorlage an den Gerichtshof der Europäischen Union*. (Press release from February 7th, 2014). Available at: <https://www.bundesverfassungsgericht.de/SharedDocs/Pressemitteilungen/DE/2014/bvg14-009.html> (Accessed: March 25th, 2016).
- Constâncio, Vítor (2014): ‘The European Crisis and the Role of the Financial System’, *Journal of Macroeconomics*, vol. 39, pp. 250-259.
- Cukierman, Alex (2013): ‘Monetary policy and institutions before, during, and after the global financial crisis’, *Journal of Financial Stability*, vol. 9, pp. 373-384.

De Grauwe, Paul (2013): ‘The European Central Bank as Lender of Last Resort in the Government Bond Markets’, *CESifo Economic Studies*, vol. 59, no. 3, pp. 520-535.

Draghi, Mario (2012): *Verbatim of the remarks made by Mario Draghi*. July 26th, Global Investment Conference, London. Available at: <https://www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html> (Accessed: March 26th, 2016).

Draghi, Mario/ Constâncio, Vítor (2016): *Introductory statement to the press conference (with Q&A)*. Available at: <https://www.ecb.europa.eu/press/pressconf/2016/html/is160310.en.html> (Accessed: March 25th, 2016).

ECB (2012): *Technical features of Outright Monetary Transactions*. (Press release from September 6th, 2012). Available at: http://www.ecb.europa.eu/press/pr/date/2012/html/pr120906_1.en.html (Accessed: March 26th, 2016).

ECB [no date-a]: *Expanded asset purchase programme*. Available at: <https://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html> (Accessed: March 25th, 2016).

ECB [no date-b]: *Key ECB interest rates*. Available at: <https://www.ecb.europa.eu/stats/monetary/rates/html/index.en.html> (Accessed: March 26th, 2016).

ECB [no date-c]: *The definition of price stability*. Available at: <https://www.ecb.europa.eu/mopo/strategy/pricestab/html/index.en.html> (Accessed: March 26th, 2016).

Fratzscher, Marcel (2013): ‘Zum währungspolitischen Mandat der EZB und möglichen Auswirkungen von Maßnahmen der EZB auf die nationalen Haushalte’, *Wirtschaftsdienst*, vol. 2013, no. 7, pp. 445-451.

- Fritsche, Ulrich/Tarassow, Artur (2015): 'Did the ECB Overstep Its Mandate?', *Intereconomics*, vol. 2015, no. 3, pp. 165-170.
- Fuest, Clemens (2013): 'EZB in der Grauzone zwischen Geld- und Fiskalpolitik', *Wirtschaftsdienst*, vol. 2013, no. 7, pp. 440-442.
- Giannone, Domenico/Lenza, Michele/Pill, Huw/Reichlin, Lucrezia (2012): *THE ECB AND THE INTERBANK MARKET*. Working paper series no. 1496, ECB.
- Gibson, Heather D./Palivos, Theodore/Tavlas, George S. (2014): 'The Crisis in the Euro Area: An Analytic Overview', *Journal of Macroeconomics*, vol. 39, pp. 233-239.
- Illing, Gerhard/König, Philipp (2014): 'The European Central Bank as Lender of Last Resort', *DIW Economic Bulletin*, vol. 4, no. 9, pp. 16-28.
- Issing, Otmar (2012): 'The Mayekawa Lecture: Central Banks—Paradise Lost', *Monetary and Economic Studies*, vol. 2012, no. 11, pp. 55-74.
- Issing, Otmar (2015): 'Die Deflations-Diskussion grenzt an Hysterie', *Neue Zürcher Zeitung*, January 20th, 2015. Available at: <http://www.nzz.ch/finanzen/die-deflations-diskussion-grenzt-an-hysterie-1.18464516> (Accessed: March 25th, 2016).
- Konrad, Kai A. (2013): 'Haftungsrisiken und Fehlanreize aus ESM und OMT-Programm', *Wirtschaftsdienst*, vol. 2013, no. 7, pp. 431-439.
- Pisani-Ferry, Jean (2012): 'The Euro crisis and the new impossible trinity', *Bruegel Policy Contribution*, vol. 2012, no. 1, pp. 1-16.
- Reichlin, Lucrezia (2014): 'Monetary Policy and Banks in the Euro Area: The Tale of Two Crises', *Journal of Macroeconomics*, vol. 39, pp. 387-400.
- Sinn, Hans-Werner (2014): 'Responsibility of States and Central Banks in the Euro Crisis', *CESifo Forum*, vol. 2014, no. 1, pp. 3-36.

Société Générale (2013): 'THE EURO ZONE: FALLING INTO A LIQUIDITY TRAP?', *ECONOTE*, vol. 2013, no. 22, pp. 1-16.

Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community, December 13th, 2007. 2008/C 115/01. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:C:2008:115:FULL&from=EN> (Accessed: March 24th, 2016).

Uhlig, Harald (2013): 'Outright Monetary Transactions und Target2', *Wirtschaftsdienst*, vol. 2013, no. 7, pp. 443-444.

Wallace, Paul (2016): *The Euro Experiment*. Cambridge: Cambridge University Press.

Weidmann, Jens (2012): *Rebalancing Europe*. March 26th, Chatham House, London.

Weidmann, Jens (2013a): *Eingangserklärung anlässlich der mündlichen Verhandlung im Hauptsacheverfahren ESM/EZB*. Available at: http://www.bundesbank.de/Redaktion/DE/Kurzmeldungen/Stellungnahmen/2013_06_11_esm_ezb.html?searchArchive=0&submit=Suchen&searchIssued=0&templateQueryString=ESM%2FEZB (Accessed: March 25th, 2016).

Weidmann, Jens (2013b): *Who Calls the Shots? The Problem of Fiscal Dominance*. May 24th, BdF-BBk Macroeconomics and Finance Conference, Paris.

Weidmann, Jens (2015): 'The Role of Financial Stability with Regard to Monetary Policy', *CESifo Forum*, vol. 2015, no. 1, pp. 55-63.

8. List of figures

Figure 2-1: *ECB: Loans vis-a-vis euro area NFC reported by MFI in the euro area (transaction)*. Available at: http://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=117.BSI.M.U2.Y.U.A20.A.4.U2.2240.Z01.E (Accessed: March 21st, 2016).

Figure 2-2: *ECB*: Industrial production; total including construction. Available at:
http://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=132.STS.M.I8.Y.PROD.NS0010.4.000&start=01-01-2000&end=31-01-2016&submitOptions.x=56&submitOptions.y=1&trans=N
(Accessed: March 21st, 2016).

Figure 3-1: *Wong, Thomas (2013)*: IS-LM Model with Liquidity Trap (LM Shift).
Available at: <https://medium.com/@thomasawong/quantitative-easing-and-the-zero-bound-cce99abe74c6#.oji0twgf8> (Accessed: March 21st, 2016).

Figure 5-1: *ECB*: HICP - Overall index. Available at:
http://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=122.ICP.M.U2.N.000000.4.ANR (Accessed: March 21st, 2016).