



Westfälische Wilhelms – Universität Münster Institut für Politikwissenschaft Supervisor: Prof. Dr. Norbert Konegen Bachelor Thesis University of Twente School of Management & Governance Supervisor: Dr. Tsjalle van der Burg Bachelor Thesis

Bachelor Thesis

Can an unlimited purchase of state bonds by the European Central Bank be considered as a sustainable solution to the European debt crisis?

Author: Valentin Schweinfurth 21 May 2012, Münster Hubertistraße 10 D – 48155 Münster Phone: 0049 – 176 – 4791768 Email: <u>v_schweinfurth@web.de</u> Student number: S1249495 "Ich versichere an Eides statt, dass ich die nachstehende Arbeit eigenständig und ohne fremde Hilfe angefertigt und mich anderer als der in der Arbeit angegebenen Hilfsmittel nicht bedient habe. Alle Stellen, die sinngemäß oder wörtlich aus Veröffentlichungen übernommen wurden, sind als solche kenntlich gemacht."

[Münster, 21 May 2012, Valentin Schweinfurth]

"I affirm in lieu of oath that I have written the following Bachelor Thesis independently, without outside assistance and did not use any other resources than stated in the Thesis. All parts that are adopted literally or correspondingly from any publication are marked."

[Münster, 21 May 2012, Valentin Schweinfurth]

Table of Contents

Introduction			1
The Legal Feasibility of the Purchase of State	Bonc	ls	3
Monetary Theory Background			5
Inflation			5
The Term Money Supply			6
Determining Actors of the Money Supply			9
Central Bank		9	
Commercial Banks		10	
Instruments of monetary policy			11
Minimum Reserve		12	
Open Market Operations		12	
Standing Facility		13	
Investigation of the short term inflation peril			14
Does the Money Supply Increase Inevitably?			14
Volume of the Securities Markets Program		15	
Development of the Monetary Aggregate M3		16	
Absolute Development of M3	16		
Annual Alteration Rate of M3	16		
The Correlation of the SMP and the Money Supply		17	
Step 1: Causal Inference	17		
Step 2: Was the Liquidity Increase Intended by the ECB?	18		
Concomitant Circumstances of the M3 Development18			
Liquidity Governance of the ECB since the Beginning of the SMP 21			
Step 3: The Partly Absorption of the Additional Liquidity	22		

The Regulatory Policy Consequences of an Unlimited Purchase of				
State Bonds	24			
The Long Term Economic Consequences of an U	Unlimited Purchase of			
State Bonds	27			
Conclusion	28			
References	33			
Translation of German Quotes	38			
Figures	40			
Tables	52			

Introduction

In terms of the European public debt crisis, attention is often drawn to the public deficit situation of many European Monetary Union (EMU) member states. If we consider the public debt ratio of other non–EMU states like Japan or the USA, it is evident that their public debt ratio is far higher but they are not confronted with such difficulties securing their financing (Schreyer, 2011). The substantial rise of the interest rates on some member states' government bonds reflects the fact that the global capital market considers their risk of liquidity scarcity higher than in states like Japan or the USA (Schreyer, 2011).

It may be inferred that the crisis of the Euro zone is rather based on a systemic problem of the EMU (Münchau, 2011). The systemic problem is among others to be found in the so-called *original sin*, that describes a status in which a country is unable to contract debts in their own currency (Eichengreen, Hausmann & Panizza, 2003). This implicates that each member state can be forced into a crisis of solvency and liquidity as they are unable to determine the supply conditions of interest rates and liquidity (Schreyer, 2011). If the investors have any doubts about the solidity of the public finances, they start selling the member states' government bonds. This has a negative interest rate effect and causes higher refinancing costs for the specific state. This results in an intensified debt situation (Schreyer, 2011).

Due to this spiral of debt, there is a declining confidence of the markets in the efforts of the indebted state. At this junction, it is important to comprehend the psychology of the market. Ultimately seen, the collective anticipation of the market is more determinative than the actual existing conditions (Armbruster, 2011). Not the effective balance sheets and accounts but their reliability is pivotal. If a state is both unable to convince trustworthy the investors that their bankable collaterals are safe and incapable to re-establish the credibility, the markets faith in the solvency decreases further. Equivalent to the collective logic of a bank-run, an actor can hardly free himself individually (Beck, Wienert, 2009) as he faces a situation of confidence crisis. Due to the opinion of the Sachverständigenrat für Wirtschaft (2011) the Euro zone is in such a crisis of confidence.

Accordingly, we can detect lacking mechanisms that thwarts this loss of confidence. Consequently, this begs the question of an adequate solution to the European debt crisis. A sustainable solution should solve this dilemma of confidence and should not entail any negative consequential costs that - in the long run - would result in a renewed crisis of confidence.

This thesis shall examine whether an unlimited purchase of state bonds by the European Central Bank (ECB) can be considered as a sustainable solution to the European public debt crisis.

Proponents of this approach like Dullien & Joebges (2011) or Schreyer (2011) argue that the ECB would take on the role of the *Lender of Last Resort* and hence guarantee the availability of liquidity. This availability is necessary, in cases that the holders of state bonds are definitely paid when the bonds expire (Schreyer, 2011). Since the ECB is equipped with quasi unlimited resources (Dullien & Joebges, 2011), a speculation against the ECB's pledge would be pointless (Verheyen & Belke, 2012). Hereby, the interest rates would be stabilised and the immediate illiquidity would be warded off (Schreyer, 2011). This furthermore provides a timeframe which can be used by the states to balance their budget and thus recover the market's confidence.

In the purchase of state bonds' context, two possible negative consequential costs shall be examined in this thesis. On the one hand we will discuss a possible inflation peril. On the other hand we will refer to a possible moral hazard problem that might derive from an unlimited purchase of state bonds. Distinction between two substantial dimensions will be made: the economic level of an inflation peril and the political level of a moral hazard situation will be investigated. These levels derive from the necessity to furthermore introduce two time dimensions. This is due to the fact that a solution is merely sustainable if it solves the problem not only in the short but as well in the long run. This is why we are going to analyse both the short-term consequences and the long-term consequences. It is indispensable to incorporate this time variable. Even if the aforementioned approach is in short-terms politically feasible and from an economic point of view useful, it still might cause some negative political adaptations. These possible political adaptations that can emerge in an intermediate-term then might cause negative long-term costs on an economic level. We can already detect

that we may have to examine the two substantial dimensions separately but in fact they are two sides of the same coin.

In order to investigate whether an unlimited purchase of state bonds by the ECB can be considered as a sustainable solution to the European debt crisis we will proceed as follows:

First of all, we are going to examine whether this approach is at least political and legal feasible. This is the basic prerequisite. Then, we consider the short-term economic dimension and question whether the purchase of state bonds has any short-term inflationary consequences. This shall be the focus of this thesis as this dimension is most suitable for an empiric analysis. Thereupon, we will scrutinise the medium-term political consequences such an unlimited purchase may have.

Concluding, we will investigate if this approach may have any negative economic consequential costs that emerge in the long run.

Legal Feasibility of the Purchase of Government Bonds

If we are dealing with the question whether the purchase of government bonds by the ECB can be considered as a possible solution to the public debt crisis, we first have to investigate its legal feasibility. At this point, a short abstract shall be made which outlines the legal discussion in regard to the purchase of government bonds. An assessment concerning the legitimacy and merit of a lawsuit will be – due to the given scope of this thesis – impossible at this junction. Hence, we will amplify if and how the purchase of government bonds is entrenched in European law. In addition, we will display the general positions that derive from this legal situation.

In EU Law we find a directive in the Consolidated Version of the Treaty on the Functioning of the European Union (*TFEU*) which elaborates on the purchase of government bonds. This *Article 123 I TFEU* states that the direct purchase of debt instruments by the ECB or any NCB "shall be prohibited" (*Art.123 I TFEU*). With the decision of 14 May 2010 to establish a Securities Market Programme (*SMP*) (ECB/2010/5), the ECB declares that the Europystem's central banks may purchase "eligible marketable debt instruments" (Art.1 ECB/2010/5) on the secondary market (Art.1 ECB/2010/5). This plunged the question into controversy whether a purchase

on the secondary market is in conformity with *Art.123 I TFEU*. In the following the two sides of the debate shall be displayed.

On the one hand the defender of this strategy argue that *Art. 123 I TFEU* basically prohibits the *direct* purchase of government bonds. Simply due to the mere fact of this specification an *indirect* purchase is legitimate (Dullien & Joebges, 2011). They state that otherwise the reference and emphasis on the *direct* purchase of government bonds in *Art. 123 I TFEU* would be superfluous (Dullien & Joebges, 2011). Furthermore, it is as well argued that one even could contend purchasing of government bonds on the secondary market lies within the scope of its mandate to warrant price stability according to *Art. 127 I TFEU* (Dullien & Joebges, 2011). They establish their argument by claiming that the purchase of government bonds by the ECB thwarts the risk of a collapse of the Eurosystem. Accordingly, the purchase of government bonds is conducive to the ECB's task of warranting price stability (Brockmann & Keppler, 2012). At this point, we have to query whether this assertion can simply be taken for granted since we yet do not know the long-term consequences of the SMP and we do not have any empirical evidence whether it really impeded a collapse of the Eurosystem.

On the other hand, critics of the SMP take the view that "the purchase of the government bonds on the secondary market is prohibited by *Art. 123 I TFEU*" (Kerber, 2010, p.3). Kerber (2010) argues that in case the indirect purchase is permitted by law, the specific implementation of a purchase will undermine the purport of *Art.123 I TFEU*. Accordingly, if the indirect purchase was legitimate, the whole *Art. 123 TFEU* would be irrelevant (Kerber, 2010). But the critics of the purchase of government bonds substantiate their approach not only on the basis of *Art. 123 TFEU*.

Moreover, they undergird their arguments by referring to the fading independence of the ECB (Kerber, 2011). The independence of the ECB is regulated in *Art. 130 TFEU*. The ECB stated that its independence is "a cornerstone of the monetary constitution of the euro area" (ECB, 2002a, p.45). "The independence of the ECB is ever a defensive right. It opposes against political interventions" (Kerber, 2010, p.4). Critics contend that "the severe purchase of government bonds – albeit endeavouring monetary policy reasons – is in effect implemented due to fiscal reasons" (Kerber, 2011, p.626). Under

these circumstances, the aforementioned independence from political intervention would no longer be ensured as the ECB would sheer from its monetary policy mandate and would invade into the field of member states' national budget (Sinn, 2011). This is considered as an infringement of *Art. 130 TFEU*.

In addition, it is criticised that the suspension of the credit quality threshold (ECB, 2010a) for Greek, Irish and Portuguese government bonds is infringing *Art. 127 I TFEU* in conjunction with *Art. 119 II TFEU* – which guarantee "the principle of an open market economy with free competition" (*Art.127 I TFEU in conjunction with Art.119 II TFEU*). Kerber (2012) states that ECB distorts competition by enabling a simplified access to liquidity for some states.

Finally, it is to be noticed that critics like Sinn (2011) and Kerber (2010) consider the purchase of government bonds as an infringement of *Art. 125 TFEU* – the so-called *No-Bail-out Clause*. By granting simplified access to liquidity for some countries – invoking the current necessity of such a measure merely emphasises this argument – the ECB conducts a de facto bail-out which is not in line with *Art. 125 TFEU* (Sinn, 2011).

As now revealed, the purchase of government bonds is legally contested. If and how an unlimited purchase can be consistent with EU law remains a debatable point. Unquestionably, the purchase of government bonds by the ECB is backed by reality since the enactment of the SMP. The hereinafter investigated approach of a solution to the public debt crisis is accordingly not counterfactual. Anyhow, the question of legal feasibility cannot be approved entirely due to the ambiguously defined legal situation. Despite everything, the raised question is - due to the enduring realisation of the purchase of government bonds - to be negated just as little.

Monetary Theory

Inflation

If we want to find out whether the purchase of state bonds has inflationary consequences, we first have to define the term inflation.

Inflation is understood as the loss of value of all monetary assets (Spahn, 2009). Furthermore, we can tell that inflation is ceteris paribus a constant and not only temporary increase of the general level of prices (Weiß, 2008). This discovery leads to the need to determine the term *level of prices*. "Terminological we have to distinguish strictly [...] between price stability and the stability in the general price level" (Weiß, 2008, p.36). The stability in the general price level implies that in absentia of inflation, the average of all prices is steady, whereas the price stability connotes the constancy of all prices for each single good (Weiß, 2008). Interestingly enough, it is notable that the ultimate objective of the European System of Central Banks (ESCB) is – as aforementioned – the price stability according *Article 127 TFEU*. However, this is - according to the terminological and economic distinction - a judicial error since the stability in the general price level is meant actually (Weiß, 2008).

The term money supply

It is indispensable to outline the fundamental principles and coherences of monetary policy in order to answer the raised question and theses in an adequate manner. This is due to the fact that it is inevitable to understand the monetary theory mechanisms, so as to conceptualise the causes and possible consequences of monetary policy measures like for example the purchase of government bonds by a central bank.

"The essence of money is hardly determined in theory" (Gerdesmeier, 2011, p.1). If we try to narrow it down nevertheless, we apriori have to ask what money is in general. An asset can be considered as money if it displays the crucial functions of money (Bundesbank, 2010). First of all, money is a medium of exchange and payment. It simplifies the exchange of goods and enables financial transactions (Bundesbank, 2010). "For that to happen, the respective form of money must be generally accepted" (Bundesbank, 2010, p.10). Regarding history, the decision whether a good inhered the character of money did not so much depend on legal boundaries but its general acceptance of the market participants (Gerdesmeier, 2011,). Furthermore, money has a function as an arithmetic unit. "The abstract unit 'money' enables us to express the value of goods and assets in a common benchmark and thus making the value comparable" (Bundesbank, 2010, p.10). A further function of money is the store of purchasing power function. "The confidence in the stable value of money serves as a basis for the monetary system" (Bundesbank, 2010, p.11). It provides the advantage that the purchase and sale of an asset have not necessarily to be synchronic. A good or an asset has to fulfil all these functions so that one can call it money (Bundesbank, 2010).

It is important to keep these terminological functions in mind – especially the function of exchange and payment – as they build the delimitative foundation to categorise the money supply of a certain economy (Bundesbank, 2012). We will need this categorisation as it enables us to quantify the amount of liquidity and thus detect a possible growth and any inflationary tendencies.

To measure the money supply is not only of great significance for us but as well for a central bank. "In order that the price level remains firm a restricted amount of money has to be in circulation" (Bundesbank, 2010, p.63). Only money that is – compared to the existing products on offer – scarce, holds its value. Accordingly, it was unavoidable to establish a certain concept of measurement that guarantees that one can detect changes of the money supply and thus react adequately with monetary policy provisions in order to preserve price stability (Bundesbank, 2010). Existing possible measures in this context will be explained later on.

Money supply can be regarded as the monetary stock of domestic non-banks that fulfil the payment function (Gerdesmeier, 2011). Hence, the term money supply was conceptualised as a measure of liquidity - which can be used by non-banks as a means of payment (Bundesbank, 2010). Since banks are financial intermediaries (Gerdesmeier, 2011), their "stock of instruments of payment does not serve for the demand for goods but for the converting of deposit money in cash money" (Gerdesmeier, 2011, p.5). Accordingly, banks' stock of instruments of payment is not included when we speak of money supply. In line with the international practice, the Euro system uses the degree of liquidity as the criterion for demarcation in this context (ECB, 2011a). Since there is a fluent passage between money as a means of payment and money as a store of purchasing power (Bundesbank, 2010), different monetary aggregates exist. The Euro system has "defined a narrow (M1), an 'intermediate' (M2) and a broad monetary aggregate (M3)" (ECB, 2011a, p. 50), whereas the broader monetary aggregates always imply a decrease in liquidity.

The monetary aggregate M1 displays all means of payment which inhere the highest degree of liquidity highlighting its immediate use "for the realisation of a financial obligation" (Gerdesmeier, 2011, p.6). It is uncontested that cash money and

"overnight deposits, which can be immediately converted into currency or used for cashless payments" (ECB, 2011a, p. 50) carry out this function as means of payment. This is defined as the monetary aggregate M1. Concerning the monetary aggregate M2 this additionally includes "deposits that can be converted into components of narrow money, although some restrictions may apply" (ECB, 2011a, p.50). These restrictions refer to the time span a deposit can be converted into a liquid asset. M2 includes all saving deposits with a cancelation period up to three months and time deposits with duration up to two years (Bundesbank, 2010, p. 64). The monetary aggregate M3 comprises M2 and other short-term investments issued by financial institutes (Bundesbank, 2010). Due to M3's "high degree of liquidity and price certainty" (ECB, 2011a, p.50) it can be seen as a "substitute for deposits" (ECB, 2011a, p.50). Theses short-term investments include repurchase agreements, money market funds shares and debt securities up to two years (Gerdesmeier, 2011, p.12).

Since the transition between the different kinds of deposits is fluent, it often depends on the issue how the term money supply is determined. Consequently, there is no definition which is universally valid (Bundesbank, 2010). Since we are dealing with the purchase of state bonds and its possible consequences on the money supply and price level, we found ourselves within the area of analysing of monetary developments. The Governing Council of the European Central Bank decided to take M3 as a "quantitative reference value for monetary growth" (ECB, 2001). In line with the common habit of the Euro system, we are going to use the broad monetary aggregate M3 as a reference value, too.

So far, we have determined classes of monetary aggregates exist and which of these will be used in the following research. At this junction, the question raises how an existing money supply emerges and which actors impinge upon it. Since we like to investigate whether the purchase of state bonds has inflationary consequences, we apriori have to comprehend which influencing factors define the money supply of an economy. If we know the factors that influence the money supply, we know by implication which levels and actors have to be addressed in the framework of monetary measurements.

At this point, we have to emanate from the ECB, as "the ECB has conducted the single monetary policy for the euro area" (ECB, 2004, p.7) since 1 January 1999.

Determining actors of the money supply

Central Bank

The ECB– due to the state monopoly on legitimate use of force (ECB, 2006) – is our starting point. In order to understand the European monetary system, some constitutive elements of the ESCB – relevant in regard to the research question – shall be outlined. The apprehension of this field of tension is indispensable so as to understand the specific implementation of the purchase of government bonds but as well in order to gauge its possible consequences.

The ESCB comprises the ECB and the National Central Banks (NCBs) of all 27 member states of the EU. The so-called "Eurosystem" is descriptive of the real monetary policy actors – the ECB and the NCB of the 17 member states of the EU who have established the Euro as their currency (ECB, 2006). The legislative basis of the ESCB is the "Protocol on the Statute of the European System of Central Banks and the European Central Bank" (Protocol ECB), respectively the TFEU. According to *Article 2 Protocol ECB* resp. *Article127 I TFEU*, the priority objective of the "Eurosystem" is the stability of prices. The ESCB furthermore supports the common economic policy "without prejudice to the objective of price stability" (*Article 2 Protocol ECB* resp. *Article 127 I TFEU*). It is amongst other things the pivotal task of the "Eurosystem" to "define and implement the monetary policy of the Community" (*Article 3 Protocol ECB* resp. *Article 127 II TFEU*).

Our monetary systems are mixed money systems. This means that the generation of money (money creation) is determined by two actors (Borchert, 2003). On the one hand, there is the cash money creation of the central bank. On the other hand, there is the deposit money creation of the commercial banks (Gerdesmeier, 2011). So if the only determinant of money supply was the central bank, it could easily control and under circumstances sterilise an increase in money supply (Gerdesmeier, 2011). If this is the case, we could detect that the purchase of state bonds does not cause any inflationary tendencies according to the perfect accountability of the central bank. Since this is not the case and this is why we have to continue conducting our research by investigating the second actor of the money creation – the commercial banks – and question how their behaviour can be effectively governed.

Commercial Banks

Commercial banks cannot create central bank money (Gerdesmeier, 2011). The commercial banks have "the function of financial intermediaries which means they take in funds (deposits) and lend money (credits)" (Gerdesmeier, 2011, p.15). The commercial banks create money by using the monetary base (MB) – created by the central bank – in order create deposit money (Gerdesmeier, 2011). At this point, we can already detect that a commercial banks possibility to create deposit money is limited by its capability to obtain central bank money.

The money creation process conducts as follows: Let us assume that the monetary base is 200 abstract units of money. The commercial banks obtain 200 units of the central bank money. Correspondingly, the commercial banks can lend an amount of 200 units of money (M) to non-banks. We assume that there is always a given cash quota (b) which means that the non-banks hold a certain amount of their credit as cash money (B) to spend it (Walter & Kampmann, 2010). Accordingly, the amount of cash money is: B = b * M. The rest they do not spend will be used for any kind of investment or deposit (E). The amount of E is thus: E = (1 - b) * M. This means that in case that a commercial bank A deals in credits, the receiver of this credit may hand in(1-b) * M to a commercial bank B. Hence, commercial bank B has gained an additional amount of money of E = (1 - b) * M, although there is actually no additional central bank money. Since there is a minimum reserve duty for commercial banks in the Eurosystem (Gerdesmeier, 2011) a certain reserve ratio (r) of the deposit (E) has to be handed in to the central bank as minimum reserve (R). Accordingly, the minimum reserve R is: r * E This means, that the difference of E - R can be once again used by the commercial bank B to conduct credit businesses - for example with a third commercial bank C. This process then goes on until the whole amount of money is allocated (see Fig. 1).

Summarising, we can state that the monetary base (MB) is multiplied by the money creation process of the commercial banks (multiplier effect). So the real monetary supply of an economy is: MB * m. The multiplier (m) is accordingly important to know since it shows how many times a given MB is multiplied in the course of the money creation process of commercial banks (Walter & Kampmann, 2010). This multiplier is not to be influenced directly by a central bank.

At this point, we should investigate which variables determine the multiplier. According to the solution of *figure 2* the multiplier m is: 1/[b + (1 - b) * r]. This shows us that the multiplier depends on the cash quota and on the reserve ratio. According to this solution, the lower the reserve ratio respectively the cash quota, the higher the multiplier effect of the commercial bank's money creation on the money base.

In reference to our research question, the following relevance can be observed: we know that the money supply depends on the strategy of the central bank as well as the behaviour of the commercial bank system. Furthermore, we can assume that monetary governance in the course of the purchase of state bonds can be conducted on the one hand on central bank level, by operating the monetary base (Kloten, Bofinger & Ketterer, 1996). We have emphasised the importance of the multiplier in this context. On the other hand, the sterilisation can be conducted on commercial banks' level by trying to indirectly influence the mechanisms of money creation. Regarding the solution of *figure 2* we can assume that a raise of the reserve ratio respectively of the cash quota causes a decrease of the multiplier. This already hints towards the possible central bank instruments in terms of monetary policy – like for example the minimum reserve policy of the ECB. Since the cash quota depends on the payment habits of an economy, the ECB can hardly govern this (Walter & Kampmann, 2010).

We have now limited the radius of action of liquidity governance. The next step will be to give a short overview on the different types of monetary policy instruments. This is important to be considered as it will warrant that no possible radius of operation of the ECB is disregarded. The internal validity of our research is merely like that to be guaranteed.

Instruments of monetary policy

As seen before, commercial banks have a constant demand for central bank money (Bundesbank, 2010). In order to warrant a stable level of prices, the ECB has several monetary policy instruments to achieve this goal (Gerdesmeier, 2011).

Minimum reserve

In reference to Art.19 of *the Protocol ECB*, "the ECB may require credit institutions [...] to hold minimum reserve on accounts with the ECB" (Art.19 Protocol ECB). The introduction of a minimum reserve system aims to cause a structural liquidity shortage and to contribute to the restriction of an increase of money supply (Gerdesmeier, 2011). One can furthermore assume that the minimum reserve policy prevents an uncontrolled extension of the money supply in the course of the money creation process (Gerdesmeier, 2011).

Open market operations

The open market operations are in the centre of the monetary operations. They consist of collateralised credits as well as the purchase and sale of securities by the ECB at the open market (Bundesbank, 2010). The central bank can buy and sale the securities in an outright agreement or in a repurchase agreement. Such open market transactions within the framework of repurchase agreements have the advantage that the liquidity is only in circulation for the fixed duration of the transaction (Bundesbank, 2010). We can distinguish between four types of open market operations. The first type is the main refinancing operation. This operation is "executed by the Eurosystem in the form of reverse transactions" (ECB, 2009a, p. 264). Factually, the commercial banks receive credits by the ECB with duration of one week by conversely selling securities (Gerdesmeier, 2011). Such operations are technically processed in the form of standard tender (ECB, 2009a) which enables the ECB via the arrangement of terms concerning the marginal interest rate and the aggregate amount to govern liquidity (Gerdesmeier, 2011). The main refinancing operation is the primary open market operation (Gerdesmeier, 2010). The second type is the longer-term refinancing operation. These are "credit operations with a maturity of more than one week" (ECB, 2009a, p. 264). The third type is the fine-tuning operation. These operations were established "in order to deal with unexpected liquidity fluctuations in the market" (ECB, 2009a, p.263). They can serve as liquidity absorption (Gerdesmeier, 2010). The last type of open market operations is structural operations, which aim to basically change the position of the Eurosystem towards the financial sector (Gerdesmeier, 2010).

Standing facility

The standing facility is a central bank credit facility "available to counterparties at their own initiative" (ECB, 2009a, p. 268). In the Eurosystem, we distinguished from two types of standing facilities. On the one hand, we have the marginal lending facility which enables counterparties to get overnight credits from a NCB "at a pre-specified interest rate against eligible assets" (ECB, 2009a, p.265). On the other hand, we have deposit facilities which can be used by counterparties in order to make overnight deposits at a NCB (ECB, 2009a).

In regard to the research question of an inflation peril, we first adjusted the perspective we want to use when discussing this matter. Regarding money, its different functions were displayed and its role in an economy was defined. Deriving from these functions, different monetary aggregates emerge in the Eurosystem. We detected that the ECB uses M3 in the framework of its monetary analysis.

Dealing with the question whether the additional liquidity emerging in the course of the purchase of state bonds is to be siphoning off, we furthermore had to investigate which actors influence the money supply. Only like that we can spot which levels should be addressed within the scope of a sterilisation. We ascertained that it is both the ECB and the commercial bank system that create money. An outright fine-tuning of liquidity merely by the ECB is hence impossible. In the following, we examined the different monetary instruments of the ECB. Thereby, we ensure that no possible options of the ECB are disregarded.

It is indispensable to define which section of an object of study one chooses. If one selects a small section, one might lose the sight for the big picture. If one selects a great section, one possibly misses specific features and details. Consequently, it is always necessary to set the focus of a study in dependence to the research question. By terming all the relevant circumstances and particularities of the European monetary system in regard to the research question, this prerequisite should now have been taken into account.

Investigation of the short term inflation peril

In order to answer the question whether inflationary consequences emanate from the purchase of state bonds, two areas are to be investigated. On the one hand, the question arises whether the purchase of state bonds really causes an increase of the money supply. On the other hand, we have to question whether – in case that the money supply would inevitably increase – this would actually lead to a pressure on the prices. This second step is only to be made in case the ECB has no control on M3 and the money supply would thus inevitably increase.

An increase of the money supply cannot be set equal to an increase of the level of prices (Dullien & Joebges, 2011). In order to explain this relation it is appropriate to consider the quantity theory. The identity equation that derives from this theory enables to detect a relation between the money supply and the level of prices:

Money supply * velocity of money

= level of prices * real macroeconomic production (M * v = p * Yreal).

We can detect that the money supply in circulation and the level of prices may be interacting but they are not to be equalled (Güntzel, 2010). The implications of this identity equation "are at least in some form the basis for the most central banks' implementation of their monetary policy" (Güntzel, 2010).

Does the money supply increase inevitably?

As defined in the beginning, the money supply is subject to the central bank and commercial bank level. Deriving from this knowledge, we now can define our proceeding. The money supply increases if the additional liquidity created by the SMP has not been absorbed by the ECB (Central Bank level). Furthermore, the money supply increases many times over if the additionally created and not sterilised liquidity is really used by the Commercial Banks in order to expand their lending of credits (commercial bank level) (Dullien & Joebges, 2011). We should now start with observing the amount and the capacity of the SMP.

Volume of the SMPs

On the basis of *figure 4*, we can detect the accumulated value of purchased state bonds by the ECB since the beginning of the SMP. Herein, we can perceive the two great periods of the SMP in May 2010 and August 2011. This is consistent with the start of the SMP in May 2010 (ECB, 2010b) and the heralded reactivation of the SMP in August 2011 (ECB, 2011b). Already in July 2010, we can notice that the ECB has conducted bond purchasing worth \in 59 billion (*Fig. 4*). After this time point, the weekly amount of purchased state bonds rested far below the level of 5 billion (*Fig. 3*). Consequently, the total capacity merely increased about \notin 15 billion to an amount of \notin 74 billion (ECB, 2012a). As aforementioned, a new excessive purchase of state bonds – especially with Italian and Spanish origin – began after the period in August 2011 (Belke & Verheyen, 2012). This led to an increase of the total capacity to \notin 129 billion in 05 September 2011. At latest, the total capacity of the SMP rose to \notin 214 billion on 07 May 2012 (Reuters, 2012), whereas attention should be paid to the fact that no purchases of state bonds have been conducted since the end of January 2012 (ECB, 2012a).

We detected the accumulated value of the purchased state bonds and have classified its pathway. At this junction, one may ask whether this additional liquidity is reflected in the money supply. If the created liquidity was sterilised, the ECB had the ability to neutralise the consequential costs of its intervention. Accordingly, from a short-term perspective no inflation peril would emanate from the purchase of state bonds. Thus, we should face up to the development of the money supply – respectively with the development of the money aggregate M3 – and observe its development since the beginning of the SMP.

Development of the monetary aggregate M3

Absolute development of M3

Compliant with *table 1*, we can see that the aggregated Euro volume of money of M3 was \in 9,427.1 trillion in May 2010. Considering the currently latest available M3 level (March 2012), we can detect that there is a broad money supply of \in 9,868.7 trillion (*table 1*). Thus, we can perceive a money supply increase of an amount of \in 441 billion. This development is also reflected in *figure 5* (Financial Times, 2012). If we look at the whole pathway of this curve, we can assess that an increase of the money supply was not alien from the general development. This is why we should as well regard the derivative of this graph which accordingly describes the growth rate of M3 (*Fig. 6*). Based on this, we can read off whether the detected absolute increase of the money supply is merely a logical consequence of a constant growth rate or under circumstances is of such great extent, that it is reflected in rising growth rates.

Annual alteration rate of M3

We can infer from *figure* 6 that – after a constant regression of the rate (ECB, 2009b) – the annual alteration rate of M3 was 0.0 % p.a. in the beginning of the SMP (ECB, 2010c). In the months to follow we can perceive – with the exception of scattered minimal slumps – a constant increase of the growth rate which ultimately reached a value of 3.2 % p.a. in March 2012 (ECB, 2012b).

We thus can ascertain that the absolute money supply of the aggregate M3 increased to \notin 441 billion since the purchase of the state bonds began. Since this development was not very remarkable against the background of the general money supply development, we regarded the annual alteration rate of M3 and ascertained that it generally was decreasing (*Fig. 6*). In spring 2010 – the period when the SMP was introduced – a trend reversal started. From this point onwards the annual alteration rate increased again. Having an amount of 0.0 % p.a. in May 2010, it was already 1.7 % p.a. in December 2010 (ECB, 2010d). Referring to the most current data, the annual alteration rate culminated in March 2012 at a value of 3.2 % p.a..

Accordingly, we can record that not only the absolute value of M3 increased but as well its alteration rate – to be precise about 3.2 % p.a. since the start of the SMP.

Correlation of the SMP and the money supply

Consequently, we can detect that there is a correlation between the purchase of state bonds on the one side and the increase of the annual alteration rate of the monetary aggregate M3 on the other side.

At this junction, we have to inquire after the substantial nature of this correlation. It would be a premature interpretation to already conclude from this correlation that this specific development of M3 is to be ascribed to the ECB's lacking capability to sterilise the purchase of state bonds. In the following, the nature of this correlation shall be examined within three steps.

First of all, this correlation could consist of a causal inference between the purchase of state bonds and an increase of M3. This would mean that the purchase of state bonds ultimately causes an increase of M3.

Secondly, the ECB could have abstained from sterilising the additional liquidity because it was in its interest to let the money supply increase.

Thirdly, this correlation could have been detected because the additional liquidity was only partly absorbed. In this case, we should then investigate whether we can detect any evidence that the ECB may be incapable of entirely sterilising the liquidity in the future.

Step1: Causal inference

As Shadish, Cook and Campbell (2002) emphasised in their work on causal inference, a correlation is not to be put on a level with causation. We thus can determine a correlation between the SMP and the increase of M3 but this does not imply causation. We have consequently to assess whether this correlation is as well a causal inference. One prerequisite for this is that the determining variable (which is in this case the purchase of state bonds) has to precede the determined variable (which is in this case the development of M3) (Shadish, Cook & Campbell, 2002). This means that there should not be any evidence before the SMP started, that hints towards the fact that M3 would have been developed like that either way. To answer this question adequately by complying with scientific standards, we unfortunately do not have enough space due to the given frame of this research. However, we should

nevertheless indicate that the annual alteration rate reached its low point of -0.4 % p.a. in February 2010 (ECB, 2010c). It increased afterwards reaching -0.1 % p.a. until May 2010, whereas it slightly dropped again in April 2010 (ECB, Press Release, May 2010). In May 2010, it reached the neutral value of 0.0 % p.a. (Bundesbank, 2012b). As aforementioned, the growth rate increased constantly in the following. Thus, it remains doubtful whether the impulse for this increase is to be found in May 2010 or even earlier. If we remember that on 11 April 2010 the Euro group adopted the bailout package for Greece with an amount of \in 111 billion (SVR, 2011), it is questionable whether this did not already have any influences on the financial markets. In terms of causal inference, the question of whether the prerequisite of a preceding determining variable is given remains open.

Furthermore, due to Shadish, Cook and Campbell (2002) there should not be any intertwining variable between determining and determined variable. To operationalise empirically whether and to which extent an intertwining variable may had any influence on the determined variable is almost impossible. In this context, we should consider that the ECOFIN adopted a European bail-out fund with a total capacity of 500 billion on the same day the SMP was introduced (Council of the EU, 2010). It is to be assumed that this European bail-out fund provided an additional impetus. Accordingly, it is not possible to conduct a precise reduction of the cause and effect line regarding the trend reversal of the annual alteration rate.

At this point, we are unable to state whether an increase of the monetary aggregate M3 solely emanated from the SMP. Yet, the investigations of step 2 may give some indication. In case we will find out that the assumptions of step 2 - that the ECB did not sterilise liquidity due to its interest to let the money supply increase – are not fulfilled, this means by implication that a sterilisation was actually within the meaning of the ECB. Nevertheless, we detected an increase of the monetary aggregate M3. Deriving from this, we could record that it was actually the purpose of the ECB to siphon off the created liquidity but this sterilisation was unsuccessful. Via this process of elimination, we then could answer the question of causal inference since we would have detected that the ECB is incapable of sterilising the consequential costs of the SMP. Thus, the SMP would ultimately lead to an increase of the money supply.

Step 2: Intended liquidity increase of the ECB?

In order to be able to state whether the ECB let M3 increase intentionally or not, it may be advantageous to consider different parameters. On the one hand, we should regard the concomitant circumstances that accompanied the development of M3 in the last years. On the other hand, we experienced the different possibilities of liquidity governance. In regard to the specific implementation, we can infer by implication whether the ECB at least tried to absorb the additional liquidity. In case that the signs indicated that these instruments have been used in order to neutralise liquidity, we could deduce from this that the increase of liquidity was unintended – as the money supply rose nevertheless.

Concomitant circumstances of the M3 development

We should start with observing the development of the money supply. This time, we are aiming to incorporate the implications that result from the ECB's goal setting – in contradistinction to the previous descriptive observation. *Figure 6* shows that the monetary growth rate amounted 11.6 % p.a. in January 2008. Subsequently, it decreased constantly and reached a value of 6.0 % p.a. in January 2009 until it levelled out at 0.0 % p.a. in the end of 2009 and in the beginning of 2010. Accordingly, we can ascertain a rapid slump of the money supply growth rate.

Within the framework of its two pillars principle the ECB established "a quantitative reference value in terms of the growth of the monetary aggregate M3" (Gerdesmeier, 2011, p.158). This reference value determines an optimal growth of money supply of 4.5 % p.a. (ECB, 2002b). At the time the SMP started, the annual alteration rate reached a value of 0.0 % (Bundesbank, 2012b). This could not have been in the sense of the ECB. To conclude that it was consequently within the meaning of the ECB to raise liquidity in the euro area would be premature. This is due to the fact that we are dealing with a reference value and not with a money supply target (ECB, 2002b). Hence, this reference value should not be overestimated. The ECB always asserted that it is not advisable to govern the growth of M3 in a way "that it will always be in conformity with the reference value" (Gerdesmeier, 2011, p. 158). Accordingly, the ECB would only orientate its monetary policy governance by the reference value if its lower deviation or transgression was precarious in a macroeconomic way (ECB, 2012e).

Therefore, we are not yet able to derive that the massive deviation of the reference value reflected the necessity to increase the money supply from the ECB's point of view. Yet, we should try to discuss the relations that underlie this development of the monetary growth. Thereby we will be able to perceive whether this deviation of the reference value called for a liquidity increase.

In the previous chapters we dealt with the relevance of the commercial bank sector to the money creation process. Additionally, we have determined commercial banks as financial intermediaries (Gerdesmeier, 2011). In order to explain the huge slump of the money supply growth, we should thus take a glimpse on the interbank market.

Following the collapse of Lehman Brothers in 2008, the resulting financial market turbulences showed that the interbank trading was in a crisis of confidence (SVR, 2011). This entailed that the credit lending volume evermore decreased (SVR, 2011). *Figure 7* precisely reflects this development. We can perceive that the bank loans' growth rate started sinking since the beginning of 2008. While still amounting 10.0 % in November 2008, it started decreasing constantly in the following until it reached the 0.0 % mark in 2010 (*Fig. 7*). This lacking confidence among the commercial banks is thus mirrored in the negative trend of the credit lending development. We have learned that the structure of credit lending is crucial for the deposit money creation. Accordingly, we should be able to detect this in the development of the multiplier. *Figure 8* confirms this assumption. With a short delay in comparison to the multiplier of the USA, the European multiplier took a hit in the second half of 2008. Since that time it did not return to its initial level. After short periods of recovery - like for example in the first half of 2009 or the second half of 2010 - we can always detect a sharp decline in the following.

We thus can state that the interbank trading was highly dysfunctional in this period. But emanating from this fact, can we infer that the ECB tried to raise liquidity in the Eurosystem und thus did not want to absorb the additional liquidity? Is the detected dysfunctional interbank trading of such far-reaching macroeconomic consequence? If so, we can detect an intended liquidity increase. Since this decreasing money supply growth that resulted from the interbank crisis (De La Motte, Czernomoriez & Clemens, 2010) would accordingly be the motivation for the ECB to provide more liquidity as a counteraction and thus not or not entirely sterilise the state bonds. In order to emphasise the macroeconomic relevance of such a decrease in credit lending, it is appropriate to amplify the Keynesian IS-LM Model. Certainly, there are further partly contrary, explanatory approaches like for example classic attempts which deny the influence of par values on real factors against the background of the classic dichotomy (Felderer, Homburg, 2005) – but we are going to use this approach since it depicts the circumstances in hand rather well. At this junction, it is not possible to outline the whole Keynesian doctrine and the derivation of the IS-LM Model. Owing to the fact that this is a basic macroeconomic model, its comprehension is assumed and can be looked up in Felderer, Homburg (2005). Figure 9 charts the IS-LM Model. Previously, we have detected a decrease of credit lending. This signifies that financial institutions prefer holding liquidity than using it to grant credits. Compliant with the model, in which liquidity is rather hold than spent, we can register an increase of the idle balance. However, at a given money supply an idle balance growth implies a decrease of the transaction cash. As well consistent with the Keynesian doctrine but as well with the national account system (NAS), the investments and consumption that derive from the transaction cash are decisive for the macroeconomic production. Accordingly, its decrease would lead to a subsiding macroeconomic production (Felderer, Homburg, 2005).

From this theoretical consideration, we can conclude that the interbank crisis and the resulting decrease of credit lending, indeed was of macroeconomic concern. Against this background, we thus can assume that the ECB attached a high value to the sign that the annual alteration rate lied far below the quantitative reference value. Correspondingly, we can derive that it was not in the ECB's interest to sterilise the created liquidity but rather provide the interbank sector with supplementary liquidity. We are going to test this assumption by considering the specific liquidity governance.

Liquidity governance of the ECB since the beginning if the SMP

In case the increase of M3 was not intended by the ECB, this must consequently be reflected in the different possible liquidity governance instruments – like for example in raising refinancing costs for banks.

First of all, we should perceive the possibilities that fall under the term of open market operations. As aforementioned, ³/₄ of the refinancing volume of commercial banks is conducted via main refinancing operations (Illig, 2011). These operations are

conducted with full allotment by a quantity tender since October 2008 (ECB, 2008); the interest rate for the offered central bank money is firmly prescribed (Bundesbank, 2010). Hence, the rate on main refinancing operations is of huge monetary policy importance. Considering the development displayed in *figure 10*, we can perceive that this rate started sinking drastically in the second half of 2008 and in the following reached its historical low point of 1.0 %. In the course of 2011, this rate was raised again but since 2012 it again levelled out at 1.0 %. We can conclude that in case the ECB did not want to let the money supply grow, it would not have made the refinancing conditions for commercial banks that cheap. Accordingly, this interest rate development is to be seen in relation to the difficulty for banks to turn to the markets in terms of refinancing (De la Motte, Czernomoriez & Clemens, 2010). Hence, it was not within the meaning of the ECB to sterilise the additional liquidity that emerged as a result of the SMP.

This is also emphasised when regarding the development of the marginal lending rate which is counted among the standing facility: it permits the commercial banks to be provided with liquidity at short notice. The marginal lending rate features the identical development as the main refinancing rate – whereas the marginal lending rate always rested above the level of the main refinancing rate (*Fig. 11*).

We regarded the concomitant circumstances of the M3 development and assumed that the ECB took the deviation of the reference value into account. We based our argumentation on the dysfunctional interbank sector and the hence resulting decrease of the credit lending growth. Especially the macroeconomic consequences that derive from this dysfunctional interbank trading emphasised our assumption. By implication, we then supposed that the M3 development was intended. In order to verify this, we perceived the development of the base rates and detected that these rather facilitated the possibilities of refinancing. Concluding, we can ascertain that the ECB intended an increase of money supply.

Step 3: Partly absorption of the additional liquidity

Even if the ECB intended this expansion of the money supply, this still does not mean that it did not sterilise any of the state bonds' purchases. Furthermore, in concern to the control mechanisms - we have yet only regarded the asset side of the central bank balance sheet. In terms of the question whether we can indicate any approaches of a sterilisation, we hence should also examine the liability side of the central bank balance sheet. This means that the ECB can – beside the governance of the refinancing possibilities of commercial banks – also control liquidity with the help of collecting deposits (ECB, 1998). In this way, liquidity is floating back to the ECB and thus gets sterilised. The collection of deposits is conducted within irregular distance and with the help of a quick tender procedure: commercial banks make an offer and the central bank subsequently conducts an allotment. The incentive for commercial banks is that they receive a comparatively seen high interest rate (ECB, 1998). In its weekly publication on its homepage, the ECB stated that the liquidity created in the course of the SMP will be absorbed exactly in this way (ECB, 2012a). Observing this kind of balance sheet extension together with the transacted purchase of state bonds in *figure 12*, we can discern that this instrument was directly orientated towards the development of the SMP (SVR, 2011). We moreover can see that the collection of deposits amounts almost 50 % of the purchase of state bonds' volume (*Fig. 12*). Therefore, the ECB has at least partly neutralised the created liquidity (SVR, 2011).

We can draw the following conclusion: the liquidity was partly sterilised by the quick tender procedure. The explanation for this is to be found in the insights gained in Step 2. Due to the monetary policy situation, it did not stand to reason to entirely sterilise the additional liquidity. The excessive increase of M3 can, on the one hand, be attributed to the partly sterilisation. On the other hand, it can be also understood – as seen in Step 2 – by the asset side of the balance sheet. Having cheap refinancing possibilities, the commercial banks received enough liquidity in order to additionally increase the money supply.

Finally, the question of causal inference arises again. We should regard the different possible liquidity governance instruments. As seen before, liquidity was partly sterilised. It is to be examined whether there is any apparent justification that a complete sterilisation will be impossible in the future. As aforementioned, in order to limit the money supply increase, the ECB could raise the prices for refinancing and thus narrow down the demand for central bank money. Furthermore, a heightened collection of deposits could demonetise liquidity. There is as well the possibility to increase the minimum reserve ratio and hence limit the multiplier effect on the deposit money creation process (Bundesbank, 2010). Besides, there is the additional option to raise the interest rate of the deposit facility in a way that commercial banks prefer to

deposit their money at the ECB instead of using it for credit lending (SVR, 2011). This would also have sterilising effects. Summarising, there are no apparent justifications why a complete sterilisation could fail in the future. The question of causal inference of the SMP on the increase of M3 is hence to be denied.

As a result, "from a liquidity policy point of view, there is no limitation to the purchase of state bonds by a central bank" (SVR, 2011, p. 108). Against the background of these insights of step 2 and 3, we can detect that although an empirical correlation between the SMP and the M3 increase can be seen, an increase of the money supply is no inevitable consequence of the purchase of state bonds.

Thus, we outline that the purchase of state bonds is not necessarily accompanied with an increase of the money supply. We have explained the empirical evidence of the aforementioned correlation by bringing up the monetary policy focus of the ECB – which is accounted for by the financial crisis and its following developments. Furthermore, we showed that liquidity was already partly sterilised and that there is no indication that it could not be completely sterilised.

The purchase of state bonds led to an increase of the money supply in the past. In general, such an increase is not to be detected as an automatic consequence of these purchases. Furthermore, we can conclude that the ECB can control the money supply and - in dependence to the respective situation - is able to adjust this monetary aggregate adequately. At this junction we can hence answer the question whether inflationary tendencies emanate from the purchase of state bonds by stating that inflation is no inevitable consequence of the SMP.

From an economic short-term perspective the purchase of state bonds is accordingly unperilous.

Regulatory policy consequences of an unlimited purchase of state bonds

We detected that the purchase of state bonds by the ECB does not pose any economic peril at short notice. This begs the question of the direct regulatory policy consequences of an unlimited purchase. Even if the purchase is from a short-term perspective economically benign, this does not imply that it is generally seen a sensible response to the European sovereign debt crisis.

Accordingly, we have to examine which signal effects emanate of an unlimited purchase of state bonds and what subsequent inferences politics will make.

The ECB will at all hazards make sure that the functionality of the transmission mechanism of the monetary policy is warranted (Neyer, 2010). The following purchase of state bonds by the ECB would thus ensure that commercial banks are prepared to purchase state bonds of the single countries since their assessment of their default risk would abruptly diminish – due to the fact that the ECB would intervene in case of emergency. The rate for state bonds of the single European countries will be stabilised by implication (Neyer, 2010). Hence, it will be easier for the single states to refinance themselves – independent of their specific development. Exactly, signalising that refinancing is warranted – independent of the actions of the single states – is the cause of certain difficulties.

This political inference delineates a classic moral hazard problem. "The term moral hazard was characterised by the insurance industry and describes a change in the behaviour of individual market participants when being insured against a certain risk" (Maring, 2011, S. 89).

In its application to our example, this means that the single states will – "relying on the support by the central bank" (Illing, Watzka, 2008, S. 857) – change their behaviour to the effect of "assuming full risk" (Maring, 2011, S.89). The unlimited purchase of state bonds would thus result in a lacking incentive for the single states to uphold consolidation measures. As aforementioned, this is due to the fact that the refinancing is indirectly guaranteed – independent of the real fiscal development. The disciplinary effect that normally emanates from the market when a certain fiscal deficit is reached would hence be abrogated since the commercial banks no longer have to expect any noticeable loss (Storbeck, 2011). Accordingly, it is no longer rewarding for them to monitor the solvency of their business partners (Stark, 2004). Against this background, it is to be assumed that the state respectively their governments will not uphold their effort to consolidate their budgets (Storbeck, 2011). The corollary of this suspended market discipline is that the states will return to their expansive fiscal policy, extent their debts and hence procrastinate budgetary matters

(Storbeck, 2011). Considering that a comparatively small state, in terms of economy, like Greece is already *too big to fail*, the ECB is thus deprived of the ability to trustworthy threaten the states with abandoning the purchase of state bonds. Furthermore, the ECB has not the regulatory policy authority like for example the IMF. Its assistance cannot be subjected to legally binding conditions. The single states could afford unlimited public debt since the ECB had to purchase all of their emitted state bonds (Dullien, Joebges, FES, 2011). "Bringing the issue of a [state's] solvency into domain of the central bank means transferring an obligation of public finance into a monetary phenomenon" (Issing, 2011). Viewed objectively, the ECB would then conduct fiscal policy. From a political science point of view, this would mean that the ECB will become "the ultimate buyer of public debt" (Issing, 2011). The ECB would thus finance the member states' fiscal deficits.

At least at this point, we can refer to a distinct infringement of EU law. With the establishment of the European Monetary Union a communitisation of monetary policy (stage three of the EMU) was decided but not a communitisation of fiscal policy. Exactly this would occur in case of an unlimited purchase of state bonds. If the ECB has to purchase state bonds constantly, the NCBs have to increase their capital share at the ECB – in addition to the capital shares of the debtor states (Herrmann, 2011). In case of the Federal Republic of Germany, the *Bund* as the owner of the *Bundesbank* would indirectly be liable for the *Bundesbank's* capital shares at the ECB (Herrmann, 2011). This emphasises that the single states indirectly bear the full risks of this participation in the ECB.

Against the background of the resulting moral hazard problem, an unlimited purchase of state bonds is from a regulatory policy point of view an irrevocable step towards a joint liability union. On the one hand, we can assess that the ECB – due to the fact that it would not be able to threaten the states to abandon the purchase of state bonds – would ultimately lose its institutional independence and hence infringe on *Article 130 TFEU*. On the other hand, the thus resulting communitisation of debts would imply an infringement of *Article 125 TFEU*. The aforementioned *No-Bail-Out-Clause* prohibits the liability for commitments of central governments (Art. 125 TFEU). As described before, this would exactly happen as the states would be indirectly liable for the capital shares at the ECB capital. When purchasing state bonds the ECB has to

acquiesce in the reproach that the purchase of state bonds is an indirect monetisation of public debt.

Long-term economic consequences of an unlimited purchase of state bonds

Once again, we should consider the economic dimension of this topic. Which longterm consequences can accrue from the afore-made insights? On the one hand, we realised that it was within the meaning of the ECB to let liquidity rise. On the other hand, we perceived that the additional liquidity that emerges in the course of the purchase of state bonds can – in case of need – be completely sterilised. If we reminisce about the money supply development, it is made clear that the point will come sometime where it is no longer for the purpose of the ECB that the money supply grows. Sometime, the ECB has to start sterilising the constantly created liquidity at full volume. As aforementioned, the ECB would have several different possibilities or combination of possibilities ready which can be chosen. Nevertheless, we still can make some implications.

In order to neutralise the liquidity, the ECB either has to increase the base rate and thus raise the refinancing costs for commercial banks (assets side of the ECB's balance sheet) or has to set incentives for the commercial banks to deposit their money at the ECB than to use it for credit lending (liability side of the ECB's balance sheet). As shown in the previous chapter, this would lead to a similar situation as in 2008. Probably, it would result in a reduced credit lending of the commercial banks and ceteris paribus to a lower demand for credits due to the raised conditions of credit lending. This implies a macroeconomic capital shortage. As debated before, this involves a lower macroeconomic consumption and a decreasing volume of investments –at least if we give audience to the Keynesian doctrine (Felderer, Homburg, 2005).

The purchase of state bonds hence leads to a trade-off between the stability of the average price level on the one hand and economic growth on the other hand. A steady price level that is achieved in the described way would thus imply a loss in terms of macroeconomic growth.

From this, a second inference emerges. Once again, we should consult the quantity equation at this junction. If the velocity of money v is, as stated in theory, constant in short-term and in case the ECB sterilises the whole amount of the created liquidity that emerged within the purchase of state bonds, the money supply M would thus be constant, too. In the afore described case of a shrinking demand for credits and the hence resulting decrease of macroeconomic production Y_{real} , this implies that the level of prices has to rise in order to uphold the equilibrium condition of the equation. A constant velocity of money, a steady money supply and a simultaneously decreasing production leads to a rise of the price level.

In the long run, the purchase of state bonds not only implies a sprawling public debt of the member states but as well leads to a decrease of macroeconomic production and inflation.

Conclusion

We questioned if an unlimited purchase of state bonds by the ECB can be considered as sustainable solution to the European public debt crisis. For this purpose, we examined different substantial and time dimensions.

First of all, we investigated it the purchase of state bonds is at least legal feasible. In case, it is not legally feasible this approach could not be considered as a serious solution. In the course of our analysis, we ascertained that the purchase of state bonds is legally contested. Despite the legal concerns the purchase of state bonds is backed by reality for two years. Hence, it is not counterfactual to examine this approach as a possible solution to the crisis. The purchase of state bonds is thus – despite its ambiguous legal characters – in short-terms political feasible.

Consequently, we addressed the short-term economic dimension. Here, the question had arisen if the purchase of state bonds may have any inflationary consequences. In order to answer this question, we had to set the general framework and thus determined the specific focus of our research. By doing so, we took the criteria of scientific work into account. By setting this framework, our research can especially live up to the criteria of reliability and inter-subjective comprehensibility. Furthermore, this theoretical background should guarantee that our following implications are within the framework of construct validity.

So as to state whether the purchase of state bonds has any inflationary consequences, we emanated from the question whether the purchase of state bonds ultimately causes an increase of the money supply. This was important to examine as we had defined the relationship between the level of prices and the money supply with the help of the quantity equation. If the ECB was able to govern the money supply, we thus could state – at least from a short-term perspective – that the purchase of state bonds would not cause inflation. In order to answer this question, we started by looking at the volume of the SMP. Afterwards, we considered the development of the money supply since the beginning of the SMP. In a first step, we regarded the absolute development of M3 and ascertained an increase. Since this growth was not deviant from its general development, we tried not to overestimate this parameter. So as to increase the validity, we involved the annual alteration rate into our analysis. We detected that it started rising since the start of the SMP – after it had constantly decreased before. Therefore, we discern a correlation between the money supply growth and the purchase of state bonds. At this junction, the question concerning the substantial nature of this correlation arose. Since Shadish, Cook and Campbell (2002) emphasised, a correlation does not imply causation. In order to answer this question, we asked in a first step whether this correlation is simultaneously a causation.

We wondered if the essential prerequisites for a causal inference are prevailing in this context. Firstly, the determining variable should have preceded the determined variable. Owing to the ambiguous empirical evidence, this requirement was not fulfilled. Moreover, in order to detect an obvious cause and effect relationship, we should been able to eliminate any intertwining variables. This prerequisite was not precluded either as we ascertained that the ECOFIN adopted the European bail-out fund the very same day the SMP was decided. A clear cause and effect relationship was thus not able to be reproduced.

We tried to answer the question, concerning the causal inference in a second step by wondering whether the detected increase of the money supply was intended. In case it was unintended, we thus could state that the ECB was not capable of bearing the costs of its intervention. In the following, we considered the concomitant circumstances of the money supply growth. We confirmed that the monetary growth rate was rapidly decreasing between January 2008 and the beginning of 2010. The hence resulting undercutting of the quantitative reference value could have prompted the ECB to release more liquidity into circulation – if it was precarious in a macroeconomic way. We reminisced that the commercial bank sector has –due to the multiplier effect – a great influence on the money creation process. Due to this fact, we thereupon analysed the interbank sector in order to explain the great slump of the money growth. Based on the volume of credit lending, we ascertained that the commercial banks had cut back the credit lending in the wake of the financial crisis of 2008. This crisis of the interbank trading was hence displayed in the development of the multiplier. We emphasised the macroeconomic importance of this interbank crisis by using the Keynesian IS-LM Model showing which real economic consequences such a suspension of liquidity can have. We concluded that the ECB used this opportunity to let the money supply increase and thus provide the commercial banks with additional liquidity.

We then tested this assumption by regarding the specific liquidity governance of the ECB in the time since May 2010. The adjustment of the single monetary policy instruments approved our inference. The ECB relaxed the base rate and enabled the commercial banks to refinance themselves at a lower price. Accordingly, no indication was given that the ECB tried to sterilise the additional liquidity in the period since the beginning of the SMP.

In a third step, it was analysed whether any signs of a partly sterilisation of the additional liquidity was to be spotted. This time, we did not only examine the asset side of the ECB's balance sheet but also the deposit side of its balance sheet. We noted that the ECB has sterilised almost 50 % of the state bonds' purchases by collection deposits. In due consideration of the possible options to absorb liquidity, we confirmed that the ECB is basically able to even neutralise liquidity completely.

Bearing this in mind, we then inferred that there is no causal inference between the SMP and an increase of the money supply. We might have noticed an empirical correlation in the past two years but against the background of our insights this correlation does not necessarily need to be prevailing. Since the ECB thus can govern

the money supply arbitrarily, we summarised that the purchase of state bonds is from an economic short-term perspective unperilous.

After we have elaborated on the economic short-term dimension, we then posed the question which political consequences would proceed from an unlimited purchase of state bonds. In terms of politics this approach would send the signal that the refinancing is guaranteed - independently of the real fiscal policy situation of the specific state. We detected that this would cause a moral hazard problem. Against the background that the refinancing of the states would henceforth be ensured, the single states would thus no longer be encouraged to recover the faith of the market by consolidating their public finance. Due to this lacking disciplinary impact of the market, the member states would not have any incentives to balance their budget. This fact is fortified as the ECB is incapable to adopt fiscal policy provisions that have legally binding character. Moreover, we remarked that already comparatively small states like Greece are considered to be too big to fail and that the ECB is thus incapable to trustworthy threaten the states with abandoning the purchase of state bonds. Accordingly, the member states would be able to afford unlimited public debt since they could rely on the ECB as the ultimate buyer of public debt. As a consequence, the ECB would therefore effectively conduct fiscal policy by servicing the member states public debts. We stated that this is not only an infringement of the institutional independence of the ECB according to Article 130 TFEU but as well a violation of Article 125 TFEU. Since the single states would indirectly bear the risks of the ECB's policy, a factual communitisation of public debt would inevitably come about. From a regulatory policy point of view, an unlimited purchase of state bonds does not only cause a monetisation of state debt but as well constitutes an irrevocable step towards a joint liability union.

Finally, we considered the possible economic long-term consequences of an unlimited purchase of state bonds. In order to make this glimpse of future prospects, we made some assumptions: we supposed that one day it is within the meaning of the ECB to maintain the rising money supply steady. Irrespective of the specific liquidity governance instrument the ECB would chose, we still could make some implications. We conjectured that a complete sterilisation would cause a diminished credit lending since this would have emanated from rising refinancing costs or rising interest rates concerning the deposit facility. Taking account of the Keynesian doctrine, we

explained in one of the previous chapters, we hence confirmed that an unlimited purchase of state bonds would cause a trade-off between stability of prices and economic growth. With the assistance of the quantity equation that a constant money supply, a steady velocity of money and a simultaneously sinking economic production implies a rising level of prices.

Due to the aforementioned trade-off we thus detected that the purchase of state bonds would have inflationary consequences in the long run.

Considering all the aforementioned threats that can emanate from an unlimited purchase of state bonds by the ECB, this approach should not be considered as a sustainable solution to the European debt crisis.

References

- Armbruster, A. (2011, October 25). Von der erfrischenden moralischen Klarheit der Börse. Frankfurter Allgemeine Zeitung. Retrieved May 18, 2012, from <u>http://www.faz.net/aktuell/feuilleton/buecher/rezensionen/sachbuch/georg-von-wallwitz-odysseus-und-die-wiesel-von-der-erfrischenden-moralischen-klarheit-der-boerse-11504553.html</u>
- Beck, H. & Wienert, H. (2009). Anatomie der Weltwirtschaftskrise: Ursachen und Schuldige. *Aus Politik und Zeitgeschichte*, 20, 7-20.
- Belke, A. & Verheyen, F. (2012): Sündenfall EZB? Eine kritische Betrachtung der Staatsanleihenkäufe der Europäischen Zentralbank. Retrieved May 08, 2012, from Bundeszentrale für politische Bildung Web site, <u>http://www.bpb.de/internationales/europa/europa-</u> kontrovers/77075/standpunkt-ansgar-belke-und-florian-verheyen
- Bofinger, P., Feld, L., Franz, W., Schmidt, C. & Weder di Mauro, B. (2011).
 Verantwortung für Europa übernehmen. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung: Jahresgutachten 2011/12. Retrieved May 09, 2012, from <u>http://www.sachverstaendigenrat-</u>wirtschaft.de/fileadmin/dateiablage/download/gutachten/ga11_ges.pdf
- Borchert, M. (2003). *Geld und Kredit: Eine Einführung in die Geldtheorie und Geldpolitik.* München.
- Brockmann, H. & Keppler, H. (2012). EZB-Käufe von Staatsanleihen anders begründen. *Wirtschaftsdienst*, *92 (3)*.
- Council of the European Union. (2010). Economic and Financial Affairs. *Press Release of the Council of the European Union of 09 May, 2010.* Retrieved May 09, 2012, from <u>http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ecofin/1</u> <u>14324.pdf</u>
- De La Motte, L., Czernomoriez, J. & Clemens, M. (2010). Economics of trust: The interbank market during the crisis 2007 2009. *Munich Personal RePEc Archive*, 20357.
- Deutsche Bundesbank (2010). Geld und Geldpolitik. Frankfurt am Main.
- Deutsche Bundesbank (2012). *Glossar*. Retrieved May 09, 2012, from *Deutsche Bundesbank Web site*, (http://www.bundesbank.de/bildung/bildung_glossar_g.php
- Deutsche Bundesbank (2012b). Geldmenge M3: Veränderung saisonbereinigt Jahresrate. Time series TVS303J. Retrieved May 09, 2012, from

http://www.bundesbank.de/statistik/statistik_zeitreihen.en.php?func=row&tr =TVS303J#comm

- Dullien, S. & Joebges, H. (2011). Keine Angst vor EZB Käufen von Staatsanleihen. *Perspektive Internationaler Dialog*.
- ECB (1998). Die einheitliche Geldpolitik in Stufe 3: allgemeine Regelungen für die geldpolitischen Instrumente und Verfahren des ESZB. Retrieved May 10, 2012, from <u>http://www.ecb.int/pub/pdf/other/gendoc98de.pdf</u>
- ECB (2001). Review of the quantitative reference value for monetary growth. *ECB Press Release December 06, 2001.* Retrieved May 09, 2012, from <u>http://www.ecb.int/press/pr/date/2001/html/pr011206_2.en.html</u>
- ECB (2002a). *ECB Monthly Bulletin November 2002*. Retrieved May 09, 2012, from http://www.ecb.int/pub/pdf/mobu/mb200211en.pdf
- ECB (2002b). Review of the quantitative reference value for monetary growth. *ECB Press Release December 05, 2002.* Retrieved May 09, 2012, from <u>http://www.ecb.int/press/pr/date/2002/html/pr021205_1.en.html</u>
- ECB (2004). *The Monetary Policy of the ECB*. Retrieved May 10, 2012, from http://www.ecb.int/pub/pdf/other/monetarypolicy2004en.pdf
- ECB (2008). Changes in tender procedure and in standing facilities corridor. *ECB Press Release October 2008.* Retrieved May 09, 2012, from <u>http://www.ecb.eu/press/pr/date/2008/html/pr081008_2.en.html</u>
- ECB (2009a). *ECB Annual Report 2009*. Retrieved May 08, 2012, from http://www.ecb.int/pub/pdf/annrep/ar2009en.pdf
- ECB (2009b). Geldmengenentwicklung im Euro-Währungsgebiet November 2009. ECB Press Release November 2009. Retrieved May 08, 2012, from <u>http://www.bundesbank.de/download/ezb/pressenotizen/2009/20091230.geld</u> <u>menge.pdf</u>
- ECB (2010a). Decision of the European Central Bank on temporary measures relating to the eligibility of marketable debt instruments issued or guaranteed by the Greek Government. *ECB/2010/03*.
- ECB (2010b). Decision of the European Central Bank establishing a securities markets programme. *ECB/2010/5*. Retrieved May 10, 2012, from <u>http://www.ecb.int/ecb/legal/pdf/l_12420100520en00080009.pdf</u>
- ECB (2010c). Geldmengenentwicklung im Euro-Währungsgebiet May 2010. ECB Press Release May 2010. Retrieved May 08, 2012, from <u>http://www.bundesbank.de/download/ezb/pressenotizen/2010/20100628.geld</u> <u>menge.pdf</u>

- ECB (2010d). Geldmengenentwicklung im Euro-Währungsgebiet December 2010. ECB Press Release December 2010. Retrieved May 08, 2012, from <u>http://www.bundesbank.de/download/ezb/pressenotizen/2011/20110128.geld</u> <u>menge.pdf</u>
- ECB (2011a). *The Monetary Policy of the ECB*. Retrieved May 10, 2012, from http://www.ecb.int/pub/pdf/other/monetarypolicy2011en.pdf
- ECB (2011b). Statement by the President of the European Central Bank August 7, 2011. *ECB Press Release August 2011*. Retrieved May 08, 2012, from http://www.ecb.int/press/pr/date/2011. Retrieved May 08, 2012, from http://www.ecb.int/press/pr/date/2011. Retrieved May 08, 2012, from http://www.ecb.int/press/pr/date/2011. Retrieved May 08, 2012, from http://www.ecb.int/press/pr/date/2011/html/pr110807.en.html
- ECB (2012a). Summary of ad hoc communication: related to monetary policy implementation issued by the ECB since 1 January 20007. Retrieved May 08, 2012, from <u>http://www.ecb.europa.eu/mopo/implement/omo/html/communication.en.htm</u> <u>1</u>
- ECB (2012b). Geldmengenentwicklung im Euro-Währungsgebiet March 2012. *ECB Press Release March 2012.* Retrieved May 08, 2012, from <u>http://www.bundesbank.de/download/ezb/pressenotizen/2012/20120430.geld</u> <u>mengenentwicklung.pdf</u>
- ECB (2012c). Geldmengenentwicklung im Euro-Währungsgebiet April 2012. *ECB Press Release April 2012.* Retrieved May 08, 2012, from <u>http://www.bundesbank.de/download/ezb/pressenotizen/2010/20100628.geld</u> <u>menge.pdf</u>
- Eichengreen, B., Hausmann, R. & Panizza, U. (2003). Debt Intolerance and Original Sin: why they are not the same and why it matters. *NBER Working Paper Series, 10036.* Retrieved May 18, from <u>http://www.nber.org/papers/w10036.pdf?new_window=1</u>
- Felderer, B. & Homburg, S. (2005). *Makroökonomik und neue Makroökonomik*. Berlin.
- Gerdesmeier, D. (2011). *Geldtheorie und Geldpolitik: eine praxisorientierte Einführung.* Frankfurt.
- Güntzel, J. (2010). Volkswirtschaft: verständlich anschaulich kompakt. Monetäre und internationale Analyse. Ravensburg.
- Herrmann, K. (2011). Von der Wirtschafts- in die Haftungsunion. Bisherige Fehlentwicklung und aktuelle Handlungsoptionen. Sonderinformation Karl-Bräuer-Institut, 64. Retrieved May 14, 2012, from <u>http://econstor.eu/bitstream/10419/50539/1/66847842X.pdf</u>

- Illig, W. (2011). *Geldpolitik: allgemeine Erklärungen und spezieller Einsatz in der Praxis.* München.
- Issing, O. (2011, November 30). Moral Hazard will result from ECB bond buying. *Financial Times, Markets Insights.* Retrieved May 14, 2012, from <u>http://www.ft.com/cms/s/0/41640740-1a7a-11e1-ae4e-</u> <u>00144feabdc0.html#axz1uqLvSu1M</u>
- Kerber, M. (2010a). Die EZB vor Gericht. Stuttgart.
- Kerber, M. (2010b). Ankauf von Staatsanleihen durch die EZB: wie ist die neue Offenmarktpolitik der Europäischen Zentralbank zu bewerten? *Ifo Schnelldienst, 21.*
- Kerber, M. (2011). Institutionelle Unabhängigkeit als Freiheit vom Recht? Anmerkungen zur gerichtlichen Kontrolle von Zentralbankmacht. Wirtschaftsdienst, 91 (9).
- Kerber, M. (2012). Der verfälschte Wettbewerb: die ordnungspolitische Konterrevolution im Namen des Euro. *Wirtschaftsdienst, 92 (1)*.
- Kloten, N., Bofinger, P. & Ketterer, K. (1996). Neuere Entwicklungen in der Geldtheorie und Geldpolitik: Implikationen für die Europäische Währungsunion, Festschrift für Norbert Kloten. Münster
- Lachmann, G. (2011, September 26). Berliner Jurist verklagt EZB Chef Trichet. *Welt Online*. Retrieved April 04, 2012, from <u>http://www.welt.de/print/die_welt/wirtschaft/article13625587/Berliner-Jurist-verklagt-EZB-Chef-Trichet.html</u>
- Münchau, W. (2011). Original Sin: the seeds of the euro crisis are as old as the euro itself. *Foreign Policy Online*. Retrieved May 18, 2012, from <u>http://www.foreignpolicy.com/articles/2011/04/07/original_sin?page=0,1</u>
- Natansky, A. & Strohe, H. (2009). Die Ursachen der Finanz- und Bankenkrise im Lichte der Statistik. *Statistische Diskussionsbeiträge*, *35*. Retrieved May 09, 2012, from <u>http://opus.kobv.de/ubp/volltexte/2009/3791/pdf/statdisk35.pdf</u>
- Neyer, U. (2010). Neue Geldpolitik der Europäischen Zentralbank. Unkonventionelle Maßnahmen der EZB im Zuge der Finanzkrise – eine kritische Würdigung. *Wirtschaftsdienst, 90 (8)*.
- Reuters Deutschland (2012, May 07). EZB lässt umstrittenes Anleihenkaufprogramm weiter ruhen. *Reuters Deutschland Online*. Retrieved May 07, 2012, from<u>http://de.reuters.com/article/economicsNews/idDEBEE84604F20120507</u>
- Scheller, H.K. (2006). *ECB, Geschichte, Rolle, Aufgaben*. Retrieved May 09, 2012, from http://www.ecb.int/pub/pdf/other/ecbhistoryrolefunctions2006de.pdf

- Schreyer, M. (2011). Endspiel um den Euro. Notwendige wirtschaftspolitische Maßnahmen zur Überwindung der Vertrauenskrise in der Euro-Zone. WiSO direkt, Analysen und Konzepte zur Wirtschafts- und Sozialpolitik Oktober 2011. Retrieved May 17, 2012, from <u>http://library.fes.de/pdffiles/wiso/08540.pdf</u>
- Shadish, W.R., Cook, T.D. & Campbell, D.T. (2002). *Experimental and quasi experimental designs for generalized causal inference*. Houghton Mifflin: University of Michigan.
 - Sinn, W. (2011). Target Loans, Current Account Balances and Capital Flows: the ECB's Rescue Facility. *CESIfo Working Paper, 105*.
- Spahn, H.P. (2009). Geldpolitik: Finanzmärkte, neue Makroökonomie und zinspolitische Strategien. München.
- Stark, J. (2004). Das internationale Finanzsystem: Widerstandsfähigkeit und Risiken. Festvortrage zum Jubiläum ,, 25 Jahr internationale Volkswirtschaftslehre" Wirtschaftswissenschaftliche Fakultät der Eberhard Karls University, Tübingen. Retrieved May 14, 2012, from http://www.bundesbank.de/download/presse/reden/2004/20041021stark.php
- Storbeck, O. (2011, June 21). Moral Hazard wird überschätzt: Euro Schuldenkrise. *Handelsblatt Online*. Retrieved May 19, 2012, from <u>http://www.handelsblatt.com/politik/oekonomie/wissenswert/euro-</u> <u>schuldenkrise-moral-hazard-wird-ueberschaetzt/4310932.html</u>
- Walter, J. & Kampmann, R. (2010). *Makroökonomie: Wachstum, Beschäftigung, Außenwirtschafft.* Oldenburg.
- Weiß, M. (2008). Zur Geldpolitik im Euro-Währungsraum. Beschreibung, Auswirkung und Ursachenanalyse von Inflationsunterschieden. Dissertation zur Erlangung des Doktorgrades der Universität Magdeburg.
- Wilder, R. (2012). Money Multipliers: EA M3 / base money and US M2 / monetary base. Retrieved May 09, 2012, from the Economonitor Web site, <u>http://www.economonitor.com/rebeccawilder/2012/01/03/fractional-money-multipliers/</u>)

Translation of German Quotes

Gerdesmeier, 2011, p.1

"The essence of money is hardly determined in theory".

Ungeachtet dieser Bedeutung bleibt das Wesen des Geldes theoretisch nur schwer greifbar...

Gerdesmeier, 2011, p.5

[...] their "stock of instruments of payment does not serve for the demand for goods but for the converting of deposit money in cash money."

"Banken sind in erster Linie Finanzintermediäre, womit ihre Zahlungsmittelbestände nicht der Güternachfrage dienen, sondern ausschließlich dem Zweck Giralgeld in Bargeld umzutauschen."

Gerdesmeier, 2011, p.6

"[...] that they can be used immediately "for the realisation of a financial obligation."

"[...] zur Erfüllung einer Zahlungsverpflichtung benutzt werden können."

Gerdesmeier, 2011, p.5

[...] commercial banks have "the function of financial intermediaries which means they take in funds (deposits) and lend money (credits)."

"Diese (Kreditinstitute) haben die Funktion von Finanzintermediären inne, d.h. sie nehmen Gelder herein (Einlage) und leihen sie wieder aus (Kredite)."

Gerdesmeier, 2011, p. 158

"[...] a quantitative reference value in terms of the growth of the monetary aggregate M3"

[...], einen quantitativen Referenzwert für das Wachstum des Geldemengenaggregats M3

Weiß, 2008, p.36

"Terminological we have to distinguish strictly [...] between price stability and the stability in the general price level."

"Terminologisch müssen wir strikt differenzieren (...) zwischen Preisstabilität und Stabilität des Preisniveaus."

Weiß, 2008, p.38

"[...] [change of the] prices for the goods consumed by the private households."

"[...] [Veränderung der Preise] der von den privaten Haushalten konsumierten Güter"

Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung, 2011, p.108

"[...] from a liquidity policy point of view, there is no limitation to the purchase of state bonds by a central bank "

"[...] aus liquiditätspolitischer Sicht im Prinzip keine Grenzen für den Ankauf von Staatsanleihen durch eine Notenbank"

Maring, 2011, p.89

"The term moral hazard was characterised by the insurance industry and describes a change in the behaviour of individual market participants when being insured against a certain risk."

"Der Begriff Moral Hazard, der in der Versicherungswirtschaft geprägt wurde, beschreibt eine Veränderung des Verhaltens von individuellen Marktteilnehmern bei einer Versicherung gegen ein Risiko."

"[...] to assume full risk [...]"

"[...] ein größeres Risiko einzugehen [...]"

Illing & Watzka, 2008, p.857

"[...] relying on the support by the central bank."

"[...] im Vertrauen auf die Unterstützung durch die Zentralbank."

Figures



Figure1: ECB - Money creation of the commercial banks. In this figure the money creation process is displayed whereas "b" is the cash quota, "r" is the reserve ratio, "B" is the cash money, "E" are the deposits, "R" is the minimum reserve. Van

Suntum, U. (2011). *Makroökonomie Wintersemester 2011/12*. Retrieved May 19, 2012, from http://www.wiwi.uni-muenster.de/insiwo/studieren/vorl/WS1112_Makro/4.1.-Geldangebot-und--nachfrage.pdf



Figure2: Derivation of the money creation multiplier. In this figure the money creation multiplier is displayed.

Suntum, U. (2011). *Makroökonomie Wintersemester 2011/12*. Retrieved May 19, 2012, from http://www.wiwi.uni-muenster.de/insiwo/studieren/vorl/WS1112 Makro/4.1.-Geldangebot-und--nachfrage.pdf



Figure 3: ECB Eurosystem - Securities Market Program Weekly Amount. Weekly amount in ϵ million.

Bloomberg (2012). *ECB Eurosystem Securities Market Program Weekly*. Retrieved May 19,2012, from http://www.bloomberg.com/quote/ECBCSMPW:IND/chart



Figure 4: ECB Eurosystem - Securities Market Program Volume. Volume in \in *million,* 1k = 1000*.*

Bloomberg (2012). ECB Eurosystem Securities Market Program Volume. Retrieved May 19, 2012, from <u>http://www.bloomberg.com/quote/ECBCSMP:IND/chart</u>



Figure 5: Monetary aggregate M3, Euro area. Development of the monetary aggregate M3 in the euro zone since 2007.

Kaminska, I. (2012). The collateral crunch gets monetary. *Financial Times Online January 03, 2012*. Retrieved May 19, 2012, from <u>http://ftalphaville.ft.com/blog/2012/01/03/815461/the-collateral-crunch-gets-monetary/</u>



Figure6: ECB - Money Supply M3 Year over Year. Alteration rate of M3 compared to the same period of the previous year, in %.

Bloomberg (2012). Interactive Chart for ECB Money Supply M3 YoY (ECMSM3YY). **Retrieved May** 18, 2012, from <u>http://www.bloomberg.com/quote/ECMSM3YY:IND/chart</u>



Figure 7: Credit Lending of Commercial Banks in the euro zone. Credit lending compared to the same period of the previous year, in %.

Bofinger, P., Feld, L., Franz, W., Schmidt, C. & Weder di Mauro, B. (2011). Verantwortung für Europa übernehmen. *Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung: Jahresgutachten 2011/12*. Retrieved May 09, 2012, from <u>http://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/download/gutachten/ga11_ges.pdf</u>



Figure 8: Money Mulitplier M3 euro zone.

Wilder, R. (2012). Money Multipliers: EA M3 / base money and US M2 / monetary base. RetrievedMay09,2012,fromtheEconomonitorWebsite,http://www.economonitor.com/rebeccawilder/2012/01/03/fractional-money-multipliers/)



Figure 9: Implications of the LM Curve. This figure displays the LM- Curve. Whereas i –axis stands for the interest rates. The Ls – axis reflects the idle balance. The Lt – axis displays the transaction cash. The Yreal – axis depicts the real macroeconomic production. The LM – Curve illustrates all spots in which the demand and supply for money is equal. If Ls has a great value, less money is in the transaction cash and thus we can detect a lower macroeconomic production. If Ls is small, we can detect a high value of Lt and thus the macroeconomic production is high.

Suntum, U. (2011). *Makroökonomie Wintersemester 2011/12*. Retrieved May 19, 2012, from http://www.wiwi.uni-muenster.de/insiwo/studieren/vorl/WS1112 Makro/4.1.-Geldangebot-und--nachfrage.pdf



Figure 10: Development of the main refinancing operations in the euro zone.

ECB. (2012). Zinsschritte der Europäischen Zentralbank (EZB.). Retrieved May 20, 2012, from http://www.leitzinsen.info/eurozone.htm



Figure 11: Development of the base rates in the euro zone. The marked graph displays the marginal lending facility.

Bankenverband (2011). *Die Leitzinsen der Europäischen Zentralbank*. Retrieved May 18, 2012, from <u>http://www.bankenverband.de/themen/finanzmaerkte-konjunktur/leitzinsen/die-leitzinsen-der-</u> <u>europaeischen-zentralbank</u>



Figure 12: Deposits of commercial banks and purchase of state bonds by the ECB. Bofinger, P., Feld, L., Franz, W., Schmidt, C. & Weder di Mauro, B. (2011). Verantwortung für Europa übernehmen. *Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung: Jahresgutachten 2011/12.* Retrieved May 09, 2012, from <u>http://www.sachverstaendigenrat-</u> wirtschaft.de/fileadmin/dateiablage/download/gutachten/ga11_ges.pdf

Tables

Date	Level	Date	Level
2008 Dec	9,423.4	2010 Jul	9,447.1
2009 Jan	9,400.1	2010 Aug	9,465.9
2009 Feb	9,414.5	2010 Sep	9,473.0
2009 Mar	9,406.7	2010 Oct	9,461.9
2009 Apr	9,490.1	2010 Nov	9,529.2
2009 May	9,462.8	2010 Dec	9,574.8
2009 Jun	9,456.6	2011 Jan	9,526.8
2009 Jul	9,420.0	2011 Feb	9,549.8
2009 Aug	9,379.2	2011 Mar	9,567.9
2009 Sep	9,377.5	2011 Apr	9,637.3
2009 Oct	9,361.4	2011 May	9,678.8
2009 Nov	9,340.4	2011 Jun	9,693.1
2009 Dec	9,381.5	2011 Jul	9,686.1
2010 Jan	9,325.5	2011 Aug	9,759.1
2010 Feb	9,305.4	2011 Sep	9,804.3
2010 Mar	9,315.9	2011 Oct	9,761.4
2010 Apr	9,399.9	2011 Nov	9,751.2
2010 May	9,427.1	2011 Dec	9,794.0
2010 Jun	9,469.8	2012 Jan	9,756.0
		2012 Feb	9,769.3
		2012 Mar	9,868.7

Table 1: ECB – historical time series on the monetary aggregate M3.

ECB (2012). *ECB Monetary Statistics April 2012*. Retrieved May 18, 2012, from https://stats.ecb.europa.eu/stats/download/bsi_ma_flows/bsi_ma_flows/bsi_maflows.pdf