

---

# The Purchase of State Bonds by the ECB – is the Euro Zone Threatened by Inflation?

Helena Offenborn

## **Bachelor Thesis**

### **Public Administration (Special Emphasis: European Studies)**

1<sup>st</sup> supervisor: Prof. Dr. Karsten Mause

2<sup>nd</sup> supervisor: M.Sc. Martin Stienstra

Student number Münster: 365712

Twente: s1244833

Graz, 20<sup>th</sup> of March 2013

Word Count: 11 295

## Declaration of Academic Honesty

I hereby declare that to the best of my knowledge and belief, the bachelor thesis in hand on the topic

*The Purchase of State Bonds by the ECB – is the Euro Zone Threatened by Inflation?*

is the result of my own independent work and does not make use of other sources or materials than those referenced and that quotations and paraphrases obtained from the work of others are indicated as such.

Graz, 20<sup>th</sup> of March 2013



Helena Offenborn

**TABLE OF CONTENTS**

**LIST OF TABLES AND GRAPHS ..... I**

**LIST OF ACRONYMS ..... II**

**1. INTRODUCTION ..... 1**

**2. THEORETICAL BACKGROUND: THE PURCHASE OF STATE BONDS BY THE ECB ..... 3**

2.1. LEGAL FRAMEWORK ..... 3

2.2. THE PURCHASE OF STATE BONDS DURING THE EURO CRISIS ..... 5

2.3. THEORETICAL APPROACH ..... 6

*Monetarism* 7

*Consumer Expectations* 10

2.4. HYPOTHESES ..... 11

**3. RESEARCH DESIGN ..... 11**

3.1. INTERRUPTED TIME-SERIES DESIGN ..... 12

3.2. OPERATIONALISATION ..... 13

*Sovereign Bond Purchases* 13

*Money Supply* 13

*Inflation Expectations* 15

*Inflation* 16

3.3. CASE SELECTION ..... 16

**4. EMPIRICAL ANALYSIS AND FINDINGS ..... 17**

4.1. DEVELOPMENT OF MONEY SUPPLY ..... 17

*Money Aggregate M3* 17

*Base Money* 18

*Hypothesis I: Sovereign Bond Purchases Increased the Money Supply* 18

4.2. CONSUMER EXPECTATIONS ..... 19

*Hypothesis II: Sovereign Bond Purchases Increased Inflation Expectations* 19

4.3. INFLATION RATE ..... 19

*Hypothesis III: Sovereign Bond Purchases Caused Inflation* 20

**5. CRITICAL DISCUSSION OF THE FINDINGS ..... 20**

5.1. VALIDITY ..... 21

5.2. MEASUREMENT ISSUES ..... 22

5.3. WHY NO SIGNIFICANT INCREASE OF M3? ..... 24

5.4. IS THE QUANTITY THEORY FLAWED? ..... 25

5.5. MARGINAL INFLATIONARY CONSEQUENCES – MAYBE A SHORT-TERM PHENOMENON? ..... 25

**6. LONG-TERM INFLATION PERIL ..... 25**

6.1. NOMINAL RIGIDITIES ..... 26

6.2. MULTIPLYING EFFECTS ..... 26

6.3. BOND DEFAULTS ..... 27

6.4. MISLEADING INCENTIVES ..... 27

6.5. INFLATION FORECAST ..... 28

**7. CONCLUSION ..... 28**

**REFERENCES ..... 31**

**APPENDIX: TABLES AND GRAPHS ..... 38**

**List of Tables and Graphs**

|  |    |
|--|----|
| Table 1: Sovereign Bond Purchases by the ECB .....                 | 38 |
| Table 2: Balance Sheet of the ECB (simplified) .....               | 40 |
| Table 3: Money Creation of Commercial Banks.....                   | 41 |
| Table 4: Inflation Forecast.....                                   | 42 |
| <br>   |    |
| Graph 1: Purchased State Bonds by the ECB .....                    | 43 |
| Graph 2: Supply and Demand.....                                    | 44 |
| Graph 3: Absolute Development of M3 .....                          | 45 |
| Graph 4: Annual Growth Rate of M3.....                             | 46 |
| Graph 5: Development of Base Money .....                           | 47 |
| Graph 6: Inflation Expectations .....                              | 48 |
| Graph 7: Bond Purchases vs Inflation Expectations .....            | 49 |
| Graph 8: Inflation Rate .....                                      | 50 |
| Graph 9: Loans to Private Sector / Money Multiplier.....           | 51 |
| Graph 10: Probability Distributions of ECB Inflation Forecast..... | 52 |

**List of Acronyms**

|          |  |
|----------|--|
| EC       | European Commission  |
| ECB      | European Central Bank  |
| EFSF     | European Financial Stability Facility  |
| EMU      | European Monetary Union  |
| ESCB     | European System of Central Banks   |
| ESM      | European Stability Mechanism   |
| GDP      | Gross Domestic Product   |
| H1/H2/H3 | Hypothesis 1/2/3   |
| HICP     | Harmonised Index of Consumer Prices  |
| ITS      | Interrupted Time-Series  |
| NCB      | National Central Bank  |
| OMT      | Outright Monetary Transactions   |
| SMP      | Securities Markets Programme   |
| TFEU     | Consolidated Version of the Treaty on the Functioning of the<br>European Union |

**The Purchase of State Bonds by the ECB – is the Euro Zone Threatened by Inflation?**

## 1. Introduction

“New inflation threatens savers”; “Inflation devours wage increases”; “Inflation expectations rise”; “Fear of inflation” (Eckert, 2011; Plickert, 2012; tagesschau.de, 2012; Wiese, 2010; own translation). Paging through German newspapers such as *stern*, *Frankfurter Allgemeine Zeitung* or *Berliner Morgenpost*, headlines of the last three years speak for themselves. Germany and the euro zone are threatened; threatened by inflation. The reason: in order to tackle the euro crisis, which erupted in late 2009, the ECB<sup>1</sup> has taken up some unusual monetary measures that could trigger inflation. One of these measures is being heavily criticised due to its questionable legality – the purchase of government bonds. Starting in May 2010, the European Central Bank bought bonds of crisis countries in order to prevent sovereign defaults. In doing so, the ECB changed its traditional course of drawing a clear line between monetary and fiscal policy and thereby threatens its credibility and independence (Belke, 2010a).

This paradigm shift made not only former Bundesbank president Axel Weber quit his job, it is also being condemned by his successor Jens Weidmann. According to him, “such a policy is [...] close to state financing via the printing press” (Carrel, 2012). Various scholars support Weidmanns position, labelling the sovereign bond purchases “a clear variant of quantitative easing” (Belke, 2010a, p. 360), which may pose serious problems for the price level stability (see e.g. Belke, 2010a, 2010b; Belke & Verheyen, 2012; Projektgruppe Gemeinschaftsdiagnose, 2012). After all, hyperinflation was always induced by monetary expansions, thus the printing of money (Neyer, Hayo & Herr, 2010). Concerns that are shared by influential politicians such as Philipp Rösler, German Minister of Economic Affairs, who stated that bond purchases “promote the risk of inflation” (Zeit online, 2012). However, others highly question inflationary perils, arguing that the ECB was forced to act in such way in order to avert the worst and that the central bank is equipped with the required instruments to avoid inflation (see e.g. Brockmann & Keppler, 2012; Dullien & Joebges, 2011; Lamla & Sturm, 2012).

Whereas the argumentation of the purchase-sceptics alludes primarily to the quantity theory – an economic theory stating that an increase in money supply comes along with a rising price level – scholars in favour of the ECB’s action are

---

<sup>1</sup> The ECSB is composed of the European Central Bank (ECB) and the national central banks (NCBs). However, NCBs only realise the instructions of the ECB within the several countries. Accordingly, only the term *ECB* is used in order to simplify matters.

attributing the inflationary fears to German culture and experiences. During the first half of the 20<sup>th</sup> century, Germany twice witnessed a major inflation due to central bank financing (Busch, 2006; Sarrazin, 2012). In the middle of the Weimar Republic, one dollar was worth not less than 4.2 trillion marks. Ever since, maintaining price level stability is an important political tool to establish confidence in the German economy. This emphasis is additionally underpinned by the ordoliberal influences on economic thinking in Germany. Based on the idea that governments should enable markets to be perfectly competitive, a stable price level is decisive for German politics. As a result, the German central bank soon recognised the benefits of low inflation-rates and did everything to ensure stable prices from then on; consequently Germany was one of the countries with the lowest inflation rates during the second half of the 20<sup>th</sup> century (Busch, 2006; Dullien & Guérot, 2012; Rabatinova, 2013).

Accordingly, it must be asked whether there really is an inflationary peril as announced by German media and various scholars, or whether the warnings are merely the consequence of German ordoliberal thinking and the inflationary shaped history.<sup>2</sup> Therefore, the quantity theory will be challenged: if the purchases increased the monetary supply, did this monetary expansion cause inflation? Besides, are there further indications for possible inflationary tendencies and do they prove well-founded? In order to assess these risks, the subsequent study will investigate the following research question:

Did the purchase of government bonds by the ECB lead to inflation or will it cause inflationary tendencies in the long run?

Until now, scientifically grounded papers dealing with inflationary consequences of the ECB's bond purchases are numerable and address the possible correlation solely on a theoretical basis (e.g. Berg et al., 2012; Dullien & Joebges, 2011; Neyer et al., 2010). Empirically-based studies can only be found in related topic areas. For instance, Mehnert & Nastansky (2012) empirically test the inflationary consequences of government debts in Germany, concluding that there is an interrelationship between the two. Hence, the ensuing analysis will combine the theoretical considerations of the existing literature with an empirical investigation of the available data.

---

<sup>2</sup> For a more detailed analysis of the influence of ordoliberalism on current economic crises management, see Dullien & Guérot, 2012.



The study is organized as follows: firstly, background information is given, illustrating the legal framework and the development of bond purchases. Subsequently, the theoretical approach is explained in order to derive three hypotheses. Once the applied research design including operationalization and case selection is outlined, the first part of the research question can be analysed: did the bond purchases cause inflationary tendencies between 2010 and 2013? An empirical investigation helps to answer this question, making an ensuing critical analysis of the findings necessary. Then the second step of the research question is studied: will the bond purchases lead to inflationary tendencies in the long-term? The crucial results are summarized in a conclusion.

## 2. Theoretical Background: The Purchase of State Bonds by the ECB

### 2.1. Legal Framework

*"Be you ever so high, the law is above you."*

Lord Denning (Kerber, 2010, p. 3)

For the purpose of illustrating the exceptional behaviour of the ECB, it is first of all decisive to take a closer look at the legality of its methods. By purchasing government bonds, the ECB is trying to lower the risk of sovereign defaults of several member states (Eichler & Hielscher, 2012). Thus the question arises whether it is reconcilable with the ECB's mandate to support economic interests of the European Union. Secondly, it needs to be shown if the central bank is legally allowed to buy state bonds.

Article 127,1 of the Treaty on the Functioning of the European Union (2006) lays down that

*"The primary objective of the ESCB [...] shall be to maintain price stability. Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union."*

To begin with, it needs to be mentioned that the term *price stability* certainly refers to price level stability rather than to price stability for unit prices due to article 127,1,3 TFEU, which states that "the ESCB shall act in accordance with the principle of an open market economy with free competition". Since free competition is hallmarked by flexible prices, the ECB should stabilize average prices, thus the price level, and

not several unit prices (Gaitanides, 2005). Correspondingly, it is universally recognised that the term *price stability* is a judicial error.

Following this, the ECB has to assure price level stability predominantly. Only if an interference of that objective can be ruled out, the bank is allowed to support general economic policies (Ribhegge, 2011). Up to this point, it is not evident how the ECB is precluding impairments of the price level.

In order to assess the legality of the sovereign bond purchases, Article 123, I TFEU provides further help:

*“Overdraft facilities or any other type of credit facility [...] in favour of Union institutions [...] or other bodies governed by public law or public undertakings of Member States shall be prohibited, as shall the purchase directly from them by the European Central Bank or national central banks of debt instruments.”*

Thus there are two prohibitions the ECB has to adhere to: it is not allowed to grant central bank credit to the public sector, nor to directly buy government bonds (Gaitanides, 2005). Nevertheless, the article suggests that the ECB can still gain government bonds indirectly – on the capital market. In doing so, open market operations are ensured, which enable the ECB to control the monetary base (Gaitanides, 2005). Yet the legality of these secondary market purchases is still being discussed controversially. On the one hand, ECB President Mario Draghi argues that a dysfunctional monetary transmission mechanism makes the purchases necessary in order to ensure price level stability. Hence, the purchases are a prerequisite for the ECB's main function (Ewing, 2010). Other proponents add that article 123, I TFEU clearly distinguishes between direct and indirect purchases. If also the indirect purchases would be prohibited, this diction would lose its purport (Dullien & Joebges, 2011). Homburg (2012), on the other hand, opposes that indirect purchases do not only frustrate the spirit of the regulation, but are also already prohibited by law due to two reasons: firstly, article 2 of Council Regulation 3603/93 (1993) already defined that as far as “purchases are conducted for the sole purpose of managing foreign exchange reserves”, two scenarios are not considered direct purchases: if a central bank of a member state not participating in the monetary union buys bonds from another member state, or if the ECB buys bonds from a member state which is not part of the euro zone. Other circumstances are not mentioned, thus not regarded to be indirect purchases. Secondly, the German

Federal Constitutional Court already commented on the legality of bond purchases within its judgement on the ESM in September 2012, stating that

*“[...] a purchase of state bonds on the secondary market by the ECB, which aims to finance the member states budgets irrespectively of the capital market, is prohibited, being a circumvention of the ban of the budgetary financing.” (BVerfG, 2012, par.278; own translation)*

Moreover, the purchase of state bonds also implies a communitisation of debt since all member states must vouch for possible defaults. This clearly infringes the no-bailout clause set in Art. 125 TFEU, stating that member states are not liable for each other (Berg et al., 2012).

Summing up, the bond purchases do not seem to be fully covered by European Law. However, a final elucidation can only be given by the Court of Justice of the EU. For that reason, financial economist Markus Kerber has lodged a complaint with the court, which is being supported by approximately 7000 citizens. The complaint was accepted in mid-January 2013 and will be judged within two months. But even if the purchases will be licit afterwards, a queasy feeling will probably remain. Because as Thomas Mayer, former chief economist of the Deutsche Bank, puts it: „If the ECB buys state bonds on the capital market, this might not infringe the letter, but clearly the spirit of the Maastricht treaty [...]” (Häring, Heß & Maisch, 2010; own translation).

## 2.2. The Purchase of State Bonds during the Euro Crisis

During the euro crisis, the ECB increased the liquidity supply within the EMU by reducing its key interest rate gradually up to 0,75 per cent (ECB, 2013i), by switching from a variable-rate tender to a fixed-rate full allotment tender (ECB, 2009) and by lowering the minimum rating for securities accepted as collateral for refinancing activities (Eichler, 2012). In case of Greece and Ireland, state bonds were even accepted irrespectively of their classification, starting in May 2010 (Bagus, 2011; ECB, 2010a).

Even though some of these measures were already criticised among experts, the measure initialised on May 10<sup>th</sup>, 2010 caused profound indignation. In its press release of that day, the ECB (2010b) announced that „the Governing Council decided to conduct interventions in the euro area public and private debt securities

markets“. In order to protect securities markets and the monetary policy transmission mechanism, the ECB subsequently started to buy state bonds of highly indebted EMU-member states. This procedure became known as the Securities Markets Programme (ECB, 2010b; Neyer et al., 2010).

Whereas the ECB kept silent about the amount it was going to purchase in May 2010 (Breitinger, 2010), the bank announced in September 2012 that “no ex ante quantitative limits are set on the size of Outright Monetary Transactions“ (ECB, 2012). Those OMT replaced the SMP, altering the eligibility conditions. From now on, sovereign bond purchases were “attached to an [...] EFSF/ESM programme“, which means that bonds can only be bought if the concerned state agrees to reforms and an oversight by the bailout funds (ECB, 2012; Rooney, 2012). Nevertheless, German economist Christian Fahrholz (2012) does not consider the implicit threat of the ECB – to cancel the purchasing programme if a member state does not fulfil the requirements of the bailout funds – to be credible since such a withdrawal of the monetary government funding would very likely lead to an instant distortion in the euro zone.

Until now, the ECB bought state bonds in the amount of almost € 225 billion. As indicated by graph 1, there were two big buying periods, one between May and July 2010 (over € 60 billion) and another between August and December 2011 (more than € 131 billion). What is remarkable here is that the ECB did not buy any bonds since 9<sup>th</sup> of March 2012. Thus not a single state bond was yet to be bought under the OMT.

### 2.3. Theoretical Approach

In order to identify a relationship between sovereign bond purchases and inflation, the origin of inflation needs to be revealed. According to Petersen (2010), there are two principal causes for inflation: rising prices due to an increased demand for goods (demand-pull inflation) or price increases because of enhanced production costs (cost-push inflation). As indicated in the supply and demand graph (graph 2), an increased demand causes a right movement of the demand curve from  $D_0$  to  $D_1$ , which inevitably raises prices from  $P_0$  to  $P_1$ . Increased production costs, on the other hand, imply that a certain amount of goods can only be offered at higher prices – the supply curve shifts upwards from  $S_0$  to  $S_1$ , which again leads to a price increase from  $P_0$  to  $P_1$ . Nevertheless, the underlying explanations for those processes differ.

Regarding economical theories, there are two schools of thoughts to be distinguished. On the one hand, there are non-monetary theories which assume that an increased demand can occur due to several non-monetary aspects, such as a changed income distribution, an additional external demand or altered consumer sentiments, while cost-pushes are believed to be primarily the consequences of oligopolistic or monopolistic market structures, which allow price appreciations by the suppliers or price pressure for wages from labour unions. Monetarists, on the other hand, suppose that money supply and velocity of money determine the aggregate demand. However, there is no consensus on the cause of inflation within economic science to date. Whereas non-monetary theories were influential in the 60s and 70s, monetary ideas became more and more dominant from the mid-70s onwards. But regarding a possible correlation between bond purchases and inflationary tendencies, two inflation theories are applicable. A monetary demand-pull and a non-monetary cost-push/demand-pull approach, both explained below (Busch, 2006; Gaitanides, 2005).

### Monetarism

As mentioned above, monetarists believe that money supply determines inflation. As a consequence, it first needs to be proven that the purchase of state bonds increases the money supply. Therefore, the mechanism of money creation will be briefly depicted.

#### Excursion: Money Creation

Money creation and destruction is reflected in the balance sheet of the ECB, displayed in table 2. Any increase concerning the asset-side of the balance sheet is accompanied by a creation of additional central bank money; removing positions of the asset-side destroys central bank money. The balance sheet can also be stated as an equation:

$$CR + LB + S = CC + DC$$

*CR: currency reserves; LB: loans to commercial banks; S: securities; CC: cash in circulation; DC: deposits of credit institutions*

While the left side mirrors the source of the base money, the right side displays its use. Following this, central bank money is partly being created by buying securities (S), which also include state bonds.

Nevertheless, the ECB is not the only actor within the money creation process. The commercial banks also hold an important function, which becomes apparent by illustrating this process, as done in table 3: the ECB grants a loan of € 200 to a commercial bank which lends the full amount to a customer. The customer keeps 20 per cent, thus € 40, as cash money and puts the rest in his bank. Of this deposit, the bank is now required to place a certain reserve ratio for demand deposits (set by the ECB) in the central bank, in the example 25 per cent. Accordingly, the bank is still able to lend the remaining € 120 ( $160 * 0.75 = 120$ ) to another customer, who, again, keeps 20 per cent as cash money and puts the remaining € 96 ( $120 * 0.8 = 96$ ) in his bank. This process can theoretically be continued for endless periods until all deposits within the commercial banks turn into reserve ratio. Eventually, customers are holding cash in the amount of € 100 and € 100 are deposited at the ECB as reserve ratios, which compose the € 200 from the starting point. However, commercial banks hold another € 400 deposits – the commercial banks created money (Anderegg, 2007; Issing, 2011).

Summing up, the money creation process consists out of two steps: at first, the ECB creates money by buying currency reserves, granting loans to commercial banks or purchasing securities. Afterwards, commercial banks are multiplying this base money.

As shown, buying state bonds of crisis countries enlarges the monetary base, being labelled as a “a clear variant of quantitative easing” (Belke, 2010a, p. 360). Due to the enlarged money supply, the total expenditure increases, which enables a demand growth. But since this increased demand has to face an unchanged supply, prices will rise (Issing, 2011). This mechanism can be illustrated by the neo-quantity theory, a monetarist concept originating from the classical quantity theory based on a demand-pull approach.

Classical economist David Hume established the quantity theory in 1742, claiming that there is a one-to-one relation between money growth and inflation, since a change in money supply does not affect real variables (classical dichotomy) (Bénassy-Quéré, Coeuré, Jacquet & Pisani-Ferry, 2010). Years later, American economist Irving Fisher proposed an equation for this coherence – the quantity equation (Felderer & Homburg, 1992):

$$M * \bar{v} = p * Y_{real}$$

*M*: money supply;  $\bar{v}$ : money velocity; *p*: price level;  $Y_{real}$ : real GDP

According to Fisher, money velocity ( $v$ ) is only determined by the paying habits. Since money is merely seen as a means of barter, rational individuals are only holding cash in order to fulfil their transactions. From this, Fisher deduced a stable money demand and consequently a constant money velocity (Schaper, 2001). Moreover, the Say's law, predicating that supply creates its own demand, leads to the assumption of full employment and thus a fixed real GDP ( $Y_{real}$ ) (Peters, 2000).

Assuming a constant money velocity and a fixed real GDP, the mentioned one-to-one relation between money growth and inflation becomes directly visible in the notation of the classical quantity equation, especially after transposing the equation towards  $p$ :

$$p = \frac{M * \bar{v}}{Y_{real}}$$

If  $v$  and  $Y_{real}$  are constant, an increase in  $M$  automatically leads to an increase in  $p$ . Money supply expansions cause inflation.

Whereas Keynesians challenged the equation mainly due to the assumptions of a constant money velocity and a fixed real GDP (Johnson, Ley & Cate, 2001), monetarists such as Milton Friedman advanced it within the 1960s and 70s, establishing the neo-quantity theory.

Besides some minor changes, for instance concerning the underlying explanation for a stable money velocity<sup>3</sup>, Friedman basically followed the perceptions of the classicists. However, he elaborated on the so-called transmission mechanism. Whereas the quantity theory simply states *that* money supply correlates with inflation, it does not tell *how* the money supply affects the price level stability. Friedman, by contrast, distinguishes between a nominal and a real amount of money, the first being determined by central banks and the latter by economic actors who want to hold a certain amount of cash balance. Choosing their desired amount, they also decide on their expenses and accordingly determine the price level. If the central bank now enlarges the monetary base, the cash holdings of the

---

<sup>3</sup> For detailed information regarding the underlying explanation for a stable money velocity, see Albers & Zottmann, 1982; Peters, 2000; Schaper, 2001.

economic actors rise as well. Having more than the desired cash balance, economic actors try to get rid of their spare holdings by increasing their expenses. The total expenditure – thus the demand – rises. But since the supply cannot keep pace, this raised demand will be offset by higher prices (Issing, 2011).

Consequently, monetarists advanced the classical quantity theory among others by illustrating the transmission mechanism. But most importantly, the crucial statement of the quantity theory – a correlation between money growth and inflation – was taken over par for par. Until now, the ECB is using the assertions of the quantity theory to determine the desired money growth, which will not only play a role later on, but most notably exposes the central importance of Hume's theory (Gerdesmeier, 2010).

#### Consumer Expectations

In addition to the quantity theory, another theoretical approach concerning inflation makes itself relevant to bond purchases by a central bank: the influence of consumer expectations.

After the SMP was launched in 2010, experts were basically unanimous in saying that the ECB risks to lose credibility. Purchasing state bonds of crisis countries made the central bank look less politically independent. It appeared that the ECB did not only mix monetary and fiscal policies, but also stopped to concentrate first and foremost on its commitment to price level stability (Belke, 2010a; Eichler & Hielscher, 2012; Neyer et al., 2010). But this might comprise unpleasant causes, following Joachim Scheide, Kiel Institute for the World Economy:

*"If the impression is created that the ECB is pursuing a weak monetary policy, then it will increase consumers' expectations of inflation – and ultimately also the inflation rate." (Kaiser, 2011)*

If consumers do not have faith in the ECB ensuring price level stability, they probably assume inflationary consequences. Fearing currency devaluation, consumers tend to antedate consumption decisions, which causes a demand growth. Moreover, labour unions try to offset their inflation expectations by demanding higher wages within their collective bargaining. Eventually, companies react to an increased demand on the one hand, and raised production costs on the



other hand, by raising prices (Fahrholz, 2012; Gaitanides, 2005; Kaiser, 2011; Lamla & Sturm, 2011).

As demonstrated, an increase in money supply by purchasing state bonds can strongly affect price level stability, which might even be boosted by inflationary expectations of the people due to the loss of faith in the ECB.

#### 2.4. Hypotheses

Merging the aforementioned theoretical approach with the bond purchases of the ECB, the following hypotheses can be derived:

- I. By buying state bonds between May 2010 and March 2012, the ECB conducted quantitative easing, thus created money. Accordingly, it is claimed that the launch of the sovereign bond programme increased the money supply in the euro zone.
- II. Due to its purchase of government bonds, the ECB's commitment to price stability is questioned by the population of the EMU. Hence it can be hypothesized that the initialisation of the bond purchases led to enhanced inflation expectations.
- III. Assuming that H1 proves well-founded, more money is in circulation, giving rise to an increased demand. But since this increased demand has to face an unchanged supply, prices will rise. If H2 is being substantiated as well, inflation expectations have gone up, which can additionally affect price stability. Consequently, it is presumed that the launch of the SMP caused inflation.

### 3. Research Design

In order to test the aforementioned hypotheses, the decisive factor of each hypothesis (money supply, consumer expectations, inflation) will be observed over time. In doing so, a retrospective longitudinal study, more precisely an interrupted time-series study, is being conducted.

### 3.1. Interrupted Time-Series Design

According to Gerring (2012, p. 286), ITS designs are characterized by “a single treatment accompanied by multiple pre- and post-tests.” And Campbell and Ross (1968, p. 33) further state that social researchers sometimes have to evaluate “change produced in nonrandomly selected groups by events that are beyond the researcher’s control”. Both quotes get to the heart of ITS studies. As common to all longitudinal studies, a treatment group is being observed over time in order to establish causality. ITS studies in particular consist of several pretests, a single treatment and multiple posttest. There is no random assignment and no control group (Gerring, 2012). Depending on the number of tests, it can be noted as:

$$O \quad O \quad O \quad O \quad X \quad O \quad O \quad O$$

*O: pre-/ posttest; X: treatment*

Regarding the research question of whether the government bond purchases caused inflationary tendencies, the framework of an ITS design is used to test the previously derived hypotheses because this is the best applicable quasi-experimental research method in this context. Considering that the treatment – the purchase of state bonds – cannot be manipulated, that no randomisation is possible and that a control group is lacking as well, the establishment of a time dimension is of high importance, enabling observations of the same phenomenon over an extended period. Observations through time give clues to causal relations. Multiple testing is even strengthening this. In doing so, the ambiguous temporal precedence as one threat to internal validity can be ruled out; moreover, ITS studies are able to pick up long-term changes. However, it shall not be disregarded that ITS studies as a subcategory of longitudinal studies face several threats to internal validity, such as history or instrumentation,<sup>4</sup> which make it difficult to establish a causal relation between two variables. Nevertheless, it is sometimes even preferable to alter a research from a latitudinal<sup>5</sup> to a longitudinal comparison, if the alternative is a bad control group. Not for nothing, Babbie (2009, p. 107) believes that longitudinal studies are “often the best way to study changes over time” (Campbell & Ross, 1968; de Vaus, 2010; Gerring, 2012).

Following the methodological structure of an ITS design, the subsequent procedure is envisaged: as a first step, it will be tested whether the launch of the SMP in May

<sup>4</sup> For more information regarding threats to validity, see de Vaus, 2010.

<sup>5</sup> Latitudinal comparison: comparing treatment and control groups.

2010 increased money supply and inflation expectations (H1 and H2). For that reason, the dependent variables *money supply* and *inflation expectations* are being measured and observed before and after the treatment, the *launch of the SMP*, occurred. If a covariation at least concerning one hypothesis can be revealed, the theoretical approach described in chapter 2.3 is being stabilized. This allows proceeding to step two, the actual research interest: did the purchase also cause inflationary tendencies? To find out, the *inflation* of the EMU, thus the dependent variable, will be observed before and after the *launch of the SMP*, the independent variable.

But in order to ensure valid measurements, variables to be applied must first be operationalised.

### 3.2. Operationalisation

Regarding the formulated hypotheses, a correlation will be tested between the independent variable *sovereign bond purchases* and three different dependent variables, namely *money supply*, *inflation expectations* and *inflation*.

#### Sovereign Bond Purchases

As the term already releases the most important features, it should only be noted that the hypotheses will be tested by using the launch of the SMP at 10<sup>th</sup> of May 2010 as the treatment. Because even though there were two treatment periods consisting of several purchases, one in-between May 2010 and March 2011 and another one between August 2011 and March 2012 (see table 1), the launch of the SMP heralded the paradigm shift of the ECB. Consequently, this unusual policy intervention by the ECB will be considered as one single treatment in order to examine the progress after the intervention.

#### Money Supply

Within monetary theory, different methods are used to define money supply. Based on the assumption that there are assets which are clearly to be considered as *money*, the ECB decided to follow an approach dividing money supply according to the “moneyness of the assets included“ (ECB, 2013e). Besides the base money – sometimes also referred to as M0 – which includes banknotes and coins in circulation plus the minimum reserves and any excess reserves credit institutions may voluntarily hold with the ECB, there are three further categories of money differentiation according to this approach (ECB, 2013f). The first category, labelled

M1, is composed of assets that can be used as payment methods, such as cash and deposits at financial institutions. The subsequent category M2 also includes near-term time deposits, thus assets, which can easily be transformed into payment methods. Also paying regard to the function of money as a store of value, M3 additionally contains saving deposits and realisable securities, such as debt securities up to two years (ECB, 2013e; Issing, 2011).

In order to ensure price level stability, the ECB pursues a two-pillar approach, an economic and a monetary analysis. Whereas the former is also described as “inflation targeting” (Ribhegge, 2011, p. 123), the latter deals with a money supply target, which is being observed by the development of M3 as studies of the ECB proved that the monetary aggregate M3 plays a crucial role within the inflation process. Additionally, M3 is less affected by substitutions between liquid asset categories than M1 or M2 (ECB, 2013e; Ribhegge, 2011; Sachverständigenrat, 2012). Hence, M3 will on one side be used in this analysis. In doing so, both the absolute development and the annual growth rate of M3 will find consideration. Concerning the annual growth rate of M3, which compares the money aggregate to the preceding year, the ECB pursues a reference value for this growth. Using the assertions of the quantity equation, a reference value of 4.5 per cent is believed to support price level stability (Gerdemesier, 2010). In line with this, only annual growth rates above 4.5 per cent will be assumed to be significant since those figures indicate inflationary risks.

In addition to M3, the monetary base must be studied as well. Considering the theoretical approach described in section 2.4 – inflationary consequences because of demand-pull factors – it is clear that M3, not M0 is the right element to investigate. After all, demand-pull factors do occur due to money within the economic cycle, not money deposited with the ECB. But as shown in chapter 2.4, the creation of money is based on two levels: the money creation by the ECB and the ensuing multiplying effect of commercial banks. Accordingly, if the base money of the central bank is enlarged, there is the strong possibility that some of this money will enter the economic circle via the multiplying process of commercial banks, which also evokes inflationary risks. Following this, M3 needs to be studied to tell how large the money supply is at the moment and how much it changed on account of the purchase of state bonds, whereas M0 needs to be considered to make statements concerning the peril of money growth in the near future.

### Inflation Expectations

As demonstrated in section 2.4, consumer expectations can have a strong impact on price formations. Hence, it will be explored whether the expectations of the consumers of the euro area, thus the 17 member states that adopted the single currency, increased after the paradigm shift.

Since the 1960s, the European Commission manages a programme of harmonised business and consumer surveys in the EU (European Commission, 2006). Within its Harmonised EU Consumer Survey, a random sample of about 500 – 3 300 units is selected within each country, which makes a sample of 23 000 for the euro area in total. Every month, consumers are inter alia asked the following question (European Commission, 2013b):

“By comparison with the past 12 months, how do you expect that consumer prices will develop in the next 12 months? They will...

- PP ++ increase more rapidly
- P + increase at the same rate
- E = increase at a slower rate
- M – stay about the same
- MM -- fall
- N don't know" (European Commission, 2007, p. 48; European Commission ECFIN, 2013).

Subsequently, an aggregated balance is calculated, which is the weighted difference between the positive (+ / ++ ) and negative (– / – – ) answers. If the letters represent the percentage of respondents who have chosen the respective answer, the balance B is calculated as

$$B = (PP + \frac{1}{2}P) - (MM + \frac{1}{2}M)$$

Accordingly, the weighted percentage of negative answers is deducted from the weighted percentage of the positive answers. Thus the more positive the balance, the more consumers expect rising price trends. Vice versa, a negative figure implies expectations of stable or even declining price trends (deflation). As indicated by the formula, B can vary between –100, when all respondents chose “fall” (MM) and

+100, when they all selected “increase more rapidly” (PP) (European Commission, 2007).

### Inflation

Following Busch (2006), there is no acknowledged classification of inflation. While economists distinguish between a creeping, moderate or galloping inflation, percentages to classify these categories are missing. If any, inflation is simply defined as “[...] a persistent increase in the general level of prices“ (Busch, 2006, p. 178; own translation). Analogously, EU treaties do not give a precise definition but solely emphasise the objective of price stability. In 1998, the Governing Council of the ECB defined price stability “as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP)<sup>6</sup> for the euro area of below 2%”, modifying this definition in 2003 by declaring that the ECB “aim[s] to maintain inflation rates of below, but close to 2%” (ECB, 2003, p. 79). According to the ECB, an inflation rate below 2 per cent is among others a safety margin to avoid the risk of deflation<sup>7</sup>, while being low enough to obtain the benefits of price stability (ECB, 2013c). Pursuant to the ECB’s inflation target, inflation rates beyond the 2 per cent objective will be defined as inflationary.

### 3.3. Case Selection

Discussing inflationary consequences of sovereign bond purchases, the euro zone is by no means the only possible object to study: the Bank of England has so far spent US\$ 588 billion on British government debt in order to revive the British economy (Reuters, 2013) and the Federal Reserve even bought US-treasuries at a value of over US\$ 1.7 trillion (Federal Reserve, 2013; Zumbun, 2013). However, the Federal Reserve and the Bank of England are acting within budgetary unions, which means that the respective government can easily secure fiscal equalisation. The European Commission, on the other side, has no possibility to counteract in terms of fiscal policy. Thus monetising debts of certain states by buying their government bonds cannot be compensated via fiscal instruments. It is for this reason that the mandate of the ECB is defined more precisely and more narrowly than those of other central banks, which makes the change in the ECBs course –

<sup>6</sup> The HICP measures the average change in prices of a specific, regularly updated basket of consumer goods and services. In doing so, the same basket is used for all member states, but is weighted according to consumer habits (ECB, 2013h; Ribhegge, 2011).

<sup>7</sup> Facing deflation, people hoard money since they expect prices to decrease further. But because interest rates cannot fall below zero, it is difficult to stimulate the demand. Accordingly, deflation is considerably harder to combat than inflation.

mixing monetary and fiscal policy by purchasing state bonds – an exceptional and more serious case (Lamla & Sturm, 2012).

#### 4. Empirical Analysis and Findings

After the variables have been operationalised and the selection of the euro zone has been legitimized, the corresponding data can be studied. Within the following empirical section, possible covariations between the launch of the bond programme and the different independent variables will be investigated by examining the latest available figures regarding the development of the respective variable published by ECB, European Commission and Deutsche Bundesbank. The aim is to either find evidence for the proposed hypotheses or to falsify them.

##### 4.1. Development of Money Supply

###### Money Aggregate M3

In its statistical warehouse, the ECB is monthly publishing data on the value of M3 in the euro area. Looking at the absolute development of M3 (graph 3), it can be seen that the money aggregate increased from € 9.39 trillion in May 2010 to € 9.74 trillion in December 2012. Accordingly, M3 rose by € 350 billion after the treatment (the launch of the SMP) occurred. However, considering the progression before the treatment, this rise is not unusual: between October 2007 and April 2010, M3 increased from € 8.55 trillion to € 9.37 trillion, thus rose by € 820 billion. Consequently, the absolute rise of M3 should not be overestimated. In favour of greater clarity, the annual growth rate of M3 will hence be regarded as well. In this way, it can be worked out whether the absolute increase of M3 is solely the consequence of a constant growth rate or whether there have been rising growth rates as well.

Analysing graph 4, declining growth rates can be detected between October 2007 and December 2009, falling from a rather high 12.5 per cent to -0.3 per cent. As to May 2010, the month of the treatment, a growth rate of 0 per cent is observed. Subsequently, growth rates rose up to 3.9 per cent in October 2012.

In consequence it can be stated that the monetary aggregate M3 increased after the launch of the SMP. However, against the backdrop of high growth rates before May

2010 and a reference value of 4.5 per cent for M3, this rise – being beneath 3.9 per cent over the whole post-treatment period – is not significant.

### Base Money

As clearly illustrated by graph 5, the base money increased distinctly after the treatment. Using figures published by the statistical warehouse of the ECB, the monetary base increased from € 1 227.219 trillion in May 2010 to € 1 630.913 trillion in January 2013, thus rose by 403.694 trillion within the total post-treatment period. Moreover, the largest incline is also locatable after the treatment: between June 2011 and July 2012, within 13 month, the monetary base expanded by almost € 710.598 trillion. This tremendous growth can be fully revealed by comparison: between February 1999 and October 2008, thus in almost 10 years, the monetary base rose by less than € 500 trillion.

Seen in the long term, the base money highly increased after the launch of the SMP. Nevertheless, it has to be noticed that the broadening of the base money already started from the end of 2008. As a result, the monetary base also increased by € 394.836 trillion within the pre-treatment period, thus between September 2007 and May 2010.

### Hypothesis I: Sovereign Bond Purchases Increased the Money Supply

By investigating both, the development of the broad money aggregate M3 as well as the base money, the result of hypothesis I is split into two parts: on the one hand, it has been detected that M3 did increase, but not significantly. Since the target value to ensure price stability accounts for 4.5 per cent, the increasing value of M3 after the treatment is not alarming in terms of an inflation peril, amounting for less than 3.9 per cent continuously. The launch of the SMP did not increase the money aggregate M3; hypothesis I is falsified in regard to M3. Short-term inflationary tendencies due to a money supply expansion can be excluded.

The situation is different, however, for the base money. As theoretically expected, a clear increase of the base money could be registered after the treatment occurred; empirical evidence could be found for hypothesis I in regard to the base money. Long-term inflationary tendencies due to a money supply expansion are possible.



#### 4.2. Consumer Expectations

Every month, Business and Consumer Surveys are published by the Directorate General for Economic and Financial Affairs of the European Commission. Those surveys also include representative figures on the price trend expectations of consumers within the euro area, aggregated to a balance of expected price trends (see section 3.2). Graph 6 shows that this balance increased strongly after the SMP has been initialised. Whereas the balance amounted to 11.3 in May 2010, it goes up to 30.4 in March 2011, remaining at a high value before reaching 23.7 in December 2012. Bearing in mind that a value of +100 would indicate that all respondents are of the opinion that consumer prices will “increase more rapidly” (European Commission, 2007, p. 48), this is a very high figure. This evaluation can yet be substantiated by a comparison with the pre-treatment period. Even though the balance also passes the 30-mark at the beginning, it takes on negative values between April 2009 and February 2010. Accordingly, people were expecting stable or even declining price trends just before the SMP was launched. Calculating the average balance before and after the treatment, the influence of the bond programme comes into full effect: amounting to merely 9.3 between October 2007 and May 2010, the average balance comes to 21.8 between May 2010 and December 2012.<sup>8</sup> Graph 7 visualises the correlation between bond purchases and inflation expectations: bond purchases are accompanied by rising inflation expectations.

#### Hypothesis II: Sovereign Bond Purchases Increased Inflation Expectations

In compliance with the preceding analysis, hypothesis II can be supported empirically. The launch of the SMP was accompanied by rising inflation expectations of consumers within the euro area. Ensuing inflationary tendencies are possible.

#### 4.3. Inflation Rate

In order to answer the first part of the research question, whether the bond purchases of the ECB caused inflationary tendencies in the short term, the development of the HICP is of great help, depicted in graph 8. As the graph shows, the HICP did increase after the treatment, namely from 1.7 per cent in May 2010 up to a local maximum of 3 per cent in September, October and November 2011,

---

<sup>8</sup> Underlying calculation: Average balance  $B^* = \text{Sum of balances} / \text{Number of month}$   
 Pre-treatment period:  $B^* = 297.9 / 32 = 9.3$   
 Post-treatment period:  $B^* = 698.2 / 32 = 21.8$ .

reaching a value of 2.2 per cent in December 2012. However, the inflation rate did not start to rise after the treatment, but in August 2009. Moreover, the pre-treatment period features significantly higher values up to 4 per cent, which means that the rise of the HICP after May 2010 cannot be seen as unusual. Nevertheless, the average inflation rate of the pre-treatment period only amounts to 1.8 per cent, whereas the post-treatment inflation rate comes to 2.4 per cent.<sup>9</sup> Accordingly, the average inflation rate of the post-treatment period does not only top the rate before the SMP was launched, but also exceeds the inflation target of the ECB, which is “below, but close to 2%“ (ECB, 2003, p. 79). However, the average inflation rate is not primarily decisive since it can easily be heightened by outliers. Therefore, the overall development needs to be considered as well. Looking at the course of the curve between May 2010 and December 2012, the rate increased initially, but dropped in the end. Correspondingly, the launch of the SMP did not result in higher and higher inflation rates, but eventually reached a rate of 2.2 per cent, which is very close to the inflation target and even below the average rate of the post-treatment period.

#### Hypothesis III: Sovereign Bond Purchases Caused Inflation

Following the investigation of the inflation rate, empirical evidence substantiates hypothesis III. The purchase of state bonds is paralleled by inflationary tendencies, ending in an average inflation rate of 2.4 per cent between May 2010 and December 2012. Nonetheless, it is crucial to notice that the derivation from the ECB’s inflation target (being below but close to 2 per cent, thus not to exceed 1.9 per cent) merely amounts to 0.5 per cent for the average and 0.3 per cent for most current inflation rate. The inflationary tendencies are more than marginal.

### 5. Critical Discussion of the Findings

As shown in the empirical study, part one of hypothesis I – whether the SMP increased M3 – was falsified. Concerning all other hypotheses, empirical evidence could be found supporting the theoretical expectations. However, those results do not automatically imply a causal relationship between the variables. Before being interpreted critically, outcomes will hence be reviewed against the backdrop of internal validity and possible measurement problems.

---

<sup>9</sup> Underlying calculation: Average inflation rate  $I^* = \text{Sum of inflation rates} / \text{Number of month}$   
 Pre-treatment period:  $I^* = 58.4 / 32 = 1.825$   
 Post-treatment period:  $I^* = 76.8 / 32 = 2.4$ .

### 5.1. Validity

Within scientific research, the level of validity, especially in terms of internal and external validity, predicated the significance of empirical results. Studies lacking validity are often dispensable since they cannot make statements whether the respective results are truly valid. A critical analysis of the validity is therefore essential. But since this study does not aim for generalisability, an assessment of the external validity will be neglected.

According to Shadish et al. (2002), correlation does not prove causation. Thus, internal validity refers to the question whether an observed covariation reflects a causal relationship. In order to be identified as causal, a relationship between two variables must fulfil three criteria:

- i. the cause must precede the effect
- ii. the cause must be correlated to the effect
- iii. the correlation cannot be explained by a third variable.

Since the treatment – the launch of the SMP – clearly precedes the effect, for instance inflationary tendencies, the first criterion is unproblematic within this kind of longitudinal research. An ambiguous temporal precedence can be ruled out. Moreover, the second condition may be affirmed for all hypotheses for which there was empirical support. However, the latter turns out to be problematic within this research.

As already sketched out in section 3.1, using an ITS design is accompanied by several confounders, common to longitudinal designs. For instance, instrumentation problems can occur. In line with de Vaus (2010), the type of measurement might change over time in such a way that it could be confused with the treatment effect. Whereas this possibility has to be acknowledged in regard to the current study, it cannot be checked because of missing data. Nonetheless, the main threat to internal validity lies in the history threat. Because of the long monitoring period, changes in the dependent variable might occur due to events happening simultaneously with the treatment. Thus those confounding variables and not the independent variable might have actually caused the effect. In this case, the

relationship between the observed variables in section 4 would be spurious, not causal.<sup>10</sup>

In regard to hypothesis I and II, such a confounding variable can be found in the exceptional monetary policy measures of the ECB during the euro crisis. As discussed in chapter 2.3, the ECB started to counteract the crisis by using several inconvenient measures, such as a low interest rate or a full allotment tender. As a result, money became cheap and easy to get, which could enlarge the base money rapidly. Correspondingly, it cannot be precluded that those measures increased the monetary base. Moreover, the rising peril of growing liquidity could also have influenced the inflation expectation of consumers. Bearing in mind that the decision to adopt a fixed rate tender procedure was announced on 10<sup>th</sup> of May 2010 (ECB, 2013i), the very same day the SMP was introduced, this idea can be substantiated. The exceptional monetary policy measures of the ECB might have caused an increase in the base money and the inflation expectations. The relationship between the launch of the SMP and the enlargement of the monetary base, respectively the price trend expectations, is spurious. Causation cannot be proven.

Alongside with this confounder of H1 and H2, possible confounders are also spottable in terms of H3. According to Mayer (2011), industrial countries are currently facing an imported inflation. High levels of demand from emerging markets for raw materials are raising prices for those commodities, increasing not only the prices for imported goods from emerging countries, but also the prices for domestic products due to higher production costs. Hence, the observed inflationary tendencies addressed in H3 might not only be a result of the government bond purchases, but of a global inflation, also imported into the euro area.

## 5.2. Measurement Issues

Alongside with those threats to internal validity, measurement problems can also be inherent in the variables themselves, as is the case regarding the inflation rate.

According to Busch (2006), one difficulty in measuring price changes is the condition that other economic variables must be kept constant. However, goods are often modifying prices and characteristics or qualities simultaneously, which makes it hard to separate those influences. As a result, the Boskin Commission – an

---

<sup>10</sup> Spurious relationship: two variables are correlated but not causally related, for instance due to a third variable.

advisory commission to study the consumer price index of the USA – concluded in 1996 that the inflation rate is being exaggerated by 1.1 per cent annually. Referring to the Laspeyres-Index which underlies the HICP, Gaitanides (2005) reaches a similar conclusion: since changes in quality or characteristics are not considered, the HICP is being overrated by 0.5 per cent. With regard to the result of H3, an overestimation of the inflation rate of 0.5 per cent would indicate that the average inflation rate could in fact be only 1.9 per cent – a value perfectly representing the target value of the ECB. Accordingly, the already marginal inflationary tendencies spotted in H3 must be questioned.

Another measurement problem which often emerges after monetary policy actions can be found in time lags. Following Batini & Nelson (2002), monetary policy action do not directly affect inflation. In their opinion, it needs more than one year until a monetary action has the main effect on inflation. As reported by Bernanke (1999), this time lag does even amount to two years. Concerning the impacts of a money growth on inflation, a 18-month lag has been discovered for the euro area. Since the purchase of state bonds was not a one-time thing, but a process of multiple purchases that can be repeated at any time, larger inflationary tendencies might also occur after such a time lag during the next few years. Those developments are not covered by the preceding analysis. However, a theoretical approximation will give clues about the long-term inflation peril in chapter 6.

Considering the aforementioned threats to validity and the discussed measurement problems, the question arises to what extent those detections limit the significance of the findings. Whereas the measurement issues must be accepted since they are mainly a problem of the ECB's approach to measuring the HICP, the threats to validity need to be reviewed. It could not be proven that the bond purchases of the ECB *caused* rising inflation expectations, an increased money supply or an enhanced inflation rate due to possible confounding variables. But while it cannot be ruled out that other policy measures additively increased the base money, the enhanced inflation expectations are pre-eminently attributable to the bond purchases. No other policy measure denotes such a paradigm shift, diminishing the ECB's credibility to ensure price level stability. Speaking of a possibly biased inflation rate, the pettiness of the spotted inflation growth helps to evaluate the significance: despite the possibility of an imported inflation and the fact that all measures of the ECB (for instance reducing the interest rate or adapting a full allotment tender) are heading towards the same direction – the creation of additional

liquidity – inflation rates are marginal. Correspondingly, it is quite evident that the bond purchases of the ECB did not lead to significant inflationary consequences. A finding that embeds interesting inferences, as will be shown in the subsequent interpretation of crucial results, which once again emphasise the importance of the analysis.

### 5.3. Why No Significant Increase of M3?

Even though the ECB has pumped an enormous volume of liquidity into the financial system by purchasing state bonds, M3 did not increase significantly. Whereas this finding might be confusing at first glance, two consistent explanations can easily be found: either the ECB sterilised the additional money by taking an equal amount of money out of circulation (for instance by reducing credits to commercial banks or issuing own bonds), or the created money did not reach the economic circle, wherefore it does not appear in M3 (Dullien & Joebges, 2011). Due to an increased base money after the treatment, it becomes clear that the ECB did not fully sterilise the additional money. Correspondingly, the second explanation is relevant. According to the Sachverständigenrat (2012), commercial banks currently tend to hold a high amount of precautionary balances with the ECB. And Belke & Verheyen (2012, p. 3; own translation) confirm: “[...] commercial banks appear to be highly risk-averse these days, which is why they are parking a lot of liquidity at the ECB.“ As a consequence, additional liquidity does not imply a rise in lending of the banking industry and thus does not result in an increased demand nor cause inflationary tendencies (Neyer et al., 2010). The on-going caution of the commercial banks can be deduced from the left-hand side of graph 9. As demonstrated by Morgan Stanley (2012), the growth of total loans to the private sector (black curve) is at an all-time low since the end of 2009. Moreover, the money multiplier, being calculated by dividing M3 by the base money, decreased tremendously within the last few years, as demonstrated on the right-hand side of the graph. Accordingly, the initial assumption can be substantiated: the additional liquidity created by the purchases of the ECB simply does not reach the economic circle, but remains with the ECB in the form of excess reserves. Hence, it is subject to the base money, which – as proven in graph 5 – increased after the treatment. However, this entails a danger as well, discussed in section 6.

#### 5.4. Is the Quantity Theory Flawed?

Closely related to the first conclusion, another conjecture is raised: since the increased base money did not cause rising prices, is it possible that the assertions of the quantity theory are doubtful? After all, the theory clearly demonstrates a correlation between money supply and inflation. Nevertheless, the explanation for this can most widely be adopted from the preceding paragraph. Remembering that monetarists explain higher prices by an increased demand due to a surplus in the desired cash balance, the reason for the missing correlation is clear: the enhanced base money neither reached the economy nor the economic actors who chose their desired cash balance (Kater, 2011). Gaitanides (2005, p. 28; own translation) puts it in a nutshell: “A demand-pull only causes inflation if the money supply growth also leads to a growth in the total demand.” Consequently the assertions of the neo-quantity theory are not disproven, but could simply not be reviewed. However, it can be claimed that the term *money supply* used within the argumentation of classicists and monetarists does not merely refer to the monetary base.

#### 5.5. Marginal Inflationary Consequences – maybe a Short-term Phenomenon?

The last major conclusion that can be drawn from the findings of the empirical section addresses the research question itself. As has been pointed out, press, public and some scientists fear inflation due to the sovereign bond purchases of the ECB. Notwithstanding, the observed inflationary consequences are only marginal. But since inflation fears are first based on the expected and not the actual money growth, the preceding explanation holds once again. Nevertheless, another decisive factor needs to be considered: possibly, inflationary tendencies are simply not visible within the observed period. As already mentioned, inflation might be triggered by time lags and simply is, as Dornbusch, Fischer & Startz (2003) suggest, a phenomenon of the long and not the short run.

### 6. Long-term Inflation Peril

In line with the preceding objection that inflation might be a phenomenon of the long run, the subsequent paragraph will deal with the long-term inflation peril. For this purpose, the temporary nature of nominal rigidities will be discussed, followed by the multiplying effect of the base money, the impacts of possible bond defaults and structural issues reflected in misleading incentives. Subsequently, an examination of current inflation forecasts will review these assumptions.

### 6.1. Nominal Rigidities

*“In the short run [...], there is little relationship between money growth and inflation. [...] The strength of a relationship between money growth and inflation comes from the long horizon [...].”*

According to Bénassy-Quéré et al. (2010, p. 272), monetary expansion and inflation are disconnected in the short-term due to nominal rigidities. This Keynesian concept, going back to J.M. Keynes' *General Theory*, is based on the idea that nominal prices and wages cannot adjust shortly (for instance due to contracts), which is why an increase in money supply leads to a higher value of monetary holdings. As a result, the demand for securities rises, which lowers the interest. A decreasing interest, in turn, heightens investments and thus incomes; moreover, the demand for goods and services is being stimulated. Since the corresponding supply is elastic, the GDP rises. Following this, a monetary growth does not cause inflation but increases the output – a quite welcome effect (Gerdesmeier, 2010). Notwithstanding, Keynes himself demonstrates the limit of this approach, admitting that: „In the long run we are all dead“ (Blanchard & Illing, 2009, p. 828). Analogously, even the founder of Keynesianism seems to agree that monetary expansion can have positive effects in the short term, but cause inflation in the long term due to the long term adjustment of prices (Bénassy-Quéré et al., 2010). In line with this, the marginal inflationary tendencies observed within the empirical section should not utterly allay inflationary concerns, because even supporters of the counter-concept to the neo-quantity theory admit its validity in the long view.

### 6.2. Multiplying Effects

As indicated in chapter 5.3, M3 did not increase significantly because commercial banks are parking their money with the ECB and lend little to the private sector. Nevertheless, this is fraught with risk since the additional money is still in the ECB. Thus it can be used at any time to accommodate the private sector with money (Sachverständigenrat, 2012). Opinions differ, though, to what an extent this could pose an inflationary risk. According to Dreger & Wolters (2011, p. 18), the reserve balances might result in a “rapid increase in the money stock and subsequent inflation pressures”, as soon as the financial transmission mechanism returned to normality. Therefore, the ECB should return to less expansionary methods. Berg et al. (2012) confirm this mechanism, though they add that the ECB can reduce the



monetary base by selling the government bonds or raising the interest at any time. This view is shared by Brockmann & Keppler (2012), claiming that there will not be inflationary tendencies as long as the ECB is able to repatriate the base money. However, they also warn that in case of an unlimited buying of state bonds, a neutralisation of the corresponding monetary effects is hardly possible. At this junction, it cannot be assessed how well the monetary policy instruments of the ECB can fend off inflationary consequences. But the warning of Brockmann & Keppler should be heeded. Moreover, it is questionable how easily the ECB will be able to sell the junk bonds, as being suggested by Berg et al.

### 6.3. Bond Defaults

With reference to junk bonds, a further risk inevitably appears, which can trigger an additional inflation: the possible default of government securities. If bonds must be written off, those losses need to be compensated by using the ECB's own capital – thus states must add new capital – or via another monetary increase. But since states are already badly off, the second option cannot be excluded, which would probably lead to inflation (Neyer et al., 2010). Thus the independence of the ECB becomes important, which ensures that actions are orientated towards the long and not the short term (Berg et al., 2012). As already discussed, the ECB's political independence is currently doubted among large sections of the public.

### 6.4. Misleading Incentives

Another important factor in regard to a long-term inflation peril are structural difficulties accompanying the bond purchases. Stepping in when there is no other help makes the ECB a "lender of last resort" (Berg et al., 2012, p. 82). As a result, states can get the impression that there is always a solvent creditor available who is basically rewarding their misconduct. Imagining an extreme case, such a moral hazard problem can cause a progressing monetisation of sovereign debts, a liquidity glut and eventually high inflation.

In summary, there are various risks regarding a long-term inflation peril. Nevertheless, the most convincing approach is still the review, for which reason inflation forecasts will be observed.

### 6.5. Inflation Forecast

Each quarter, the ECB publishes the Survey of Professional Forecasters, a survey of 90 experts affiliated with financial or non-financial institutions based within the EU. Those experts are asked to state their expectations concerning inflation, GDP and unemployment by allocating estimated probabilities. In terms of inflation, this means that an expert notes down the likelihood that the inflation rate in 2014, for instance, will be below -1 per cent, in-between -0.5 and -1 per cent, and so forth. In this way, estimated probabilities are given for all inflation rates between -1 and 4 per cent. The exact intervals are shown in graph 10 (García, 2003). Moreover, an expected inflation rate for the next five years is being queried in order to calculate an estimated mean point, listed in table 4. As it can be seen, the expected rates will increase by 0.2 per cent within the next four years, reaching a value of 2 per cent in the long term (ECB, 2013d). This is not worrying at all. Nevertheless, the probability distribution explained above and depicted in graph 10 indicates that many experts also predicted rather high inflation rates. Taking the year 2017 as an example, respondents averagely estimated a probability of 27 per cent that rates will exceed the 2 per cent and almost 10 per cent that rates will lie between 2.5 and 2.9 per cent.

The moderate development of the inflation rate illustrated by the ECB cannot be entirely confirmed by the inflation forecast of the Consensus Economics. On a monthly basis, the macroeconomic survey firm interviews over 250 prominent financial and economic forecasters, also asking about the estimated inflation rate (Consensus Economics, 2011). The right side of table 4 presents the results. As one can see, the increase of consumer prices surpasses the expectations of the ECB, going up to 2.3 per cent in 2016. From 2015 onwards, predicted inflation rates continuously exceed the ECB's inflation target of below 2 per cent. Hence, there are also inflationary tendencies in the long-term. But again, these tendencies are marginal, surpassing the target by only 0.4 per cent at the maximum.

## 7. Conclusion

Taking the scaremongering of the German media as a starting point, the preceding study pursued the question whether the sovereign bond purchases of the ECB cause inflationary tendencies, or whether the inflationary fears can be attributed to German culture and history. On that account, the research question "did the purchase of government bonds by the ECB lead to inflation or will it cause inflationary tendencies in the long run?" was phrased, already indicating that the

study will be split in a short- and a long-term analysis. After finding out that the legality of the sovereign bond purchases is still being discussed controversially, the theoretical explanations suggested that an increase in money supply and heightened inflationary expectations, both being a possible consequence of the purchases, would cause inflation. Therefore, it was examined if those variables increased after the initialisation of the bond programme. By observing the development of the corresponding data it was discovered that the money supply remained stable in terms of the money aggregate M3, but increased regarding the base money. Additionally, inflationary expectations rose, probably due to the ECB's loss of credibility associated with the paradigm shift. Determining an enlarged monetary base and heightened inflationary expectations, it was then examined whether the sovereign bond purchases also affected the price level stability. Monitoring the HICP, only marginal inflationary tendencies were detected. The average inflation rate after the launch of the SMP merely deviated by 0.5 per cent from the target rate, a divergence which could even be ascribed to an overestimation of the HICP. An explanation for the low inflation rates was found while interpreting the results: since the base money increased but M3 did not, the money creation process was considered to be dysfunctional. Commercial banks were believed to park the additional liquidity with the ECB, and in consequence the money did not reach the economic sector and therefore did not cause a demand-pull, which would have led to inflation. Thus the neo-quantity theory could not be reviewed. However it was claimed that an increase of the base money by itself would not cause a major inflation. The question subsequently arose whether the low inflation level was a result of time lags. Accordingly, the long-term inflation peril was approached on a theoretical basis, identifying various risks that suggested inflationary tendencies in the long run. Nevertheless, the ensuing inflation forecasts did not point towards inflationary consequences within the next eight years, the highest expected rate amounting to merely 2.3 per cent in 2016.

Despite controversial discussions regarding the sovereign bond purchases and their impact on price level stability currently taking place on an European level, the preceding study could not reveal alarming inflationary tendencies. Whereas this does not fully legitimise the questionable action of the ECB due to the doubtful legal situation, this finding certainly helps to boost the acceptance of the purchases by demonstrating the central bank's compliance to the inflation target. It can therefore be assumed that the political and professional debate within the EU may dwindle since the voices of critics of political and economical opponents such as Jens

Weidmann or Philipp Rösler might diminish. Facing almost appropriate inflation rates will thus not only reinforce the ECB's credibility but also strengthen its unity. Prior to the far-reaching referendum of buying state bonds of crisis countries in September 2012, it was heard that up to six of the 23 members of the Governing Council were opposed to the programme. And even if it was eventually adopted with only one vote against it, the disjunction of the council remained to play a prominent role in the public debate (Dowideit & Watzlawek, 2012). However, having evidence that the questionable purchases did not result in inflation will encourage opponents to reconsider their position and thus might lead to a uniform appearance of the ECB. Nevertheless, it remains doubtful how well the inferences of appropriate inflation rates will go down with the public. Since large parts of the population do not exactly know what causes inflation (Berlemann, 2011), it may be presumed that many Europeans are not aware of the positive implications low inflation rates have on the bond programme – namely revealing its harmlessness. The acceptance of the population thus highly depends on whether the media use their role as opinion-formers correctly by exposing the low hazard emanating from the sovereign bond purchases of the ECB. In doing so, the debate of the central bank's paradigm shift might not be eliminated until it will be legally resolved, but will surely become trivial in terms of inflationary perils.

In order to avoid similar discussions in the event of an equivalent situation in the future, it is also advisable to get a view of the overall picture and learn how government bond purchases generally affect inflation. For this purpose, a follow-up study could analyse historical cases of central bank sovereign bond purchases. While the inclusion of different cases may raise generalizability, a retrospective orientation would allow the empirical study of long-term effects as well.

However, considering the case of the European monetary union, the preceding study could already reveal that the sovereign bond purchases of the ECB only led to marginal inflationary tendencies in the short- as well as the long-term. From the current perspective, the euro zone is not threatened by inflation.

## References

- Albers, W., & Zottmann, A. (1982). *Handwörterbuch der Wirtschaftswissenschaft*. Göttingen: Vandenhoeck & Ruprecht.
- Anderegg, R. (2007). *Grundzüge der Geldtheorie und Geldpolitik* München: Oldenbourg Wissenschaftsverlag.
- Babbie, E. (2009). *The Practice of Social Research*. Wadsworth: Cengage Learning.
- Bagus, P. (2011). *Die Tragödie des Euro* (Vol. 205 S. : Ill., graph. Darst.). München: FinanzBuch Verlag, München.
- Batini, N., & Nelson, E. (2002). The Lag from Monetary Policy Actions to Inflation: Friedman Revisited. *External MPC Unit Discussion Paper No. 6*. Retrieved 20.02.2013 from Bank of England <http://www.bankofengland.co.uk/publications/Documents/externalmpcpapers/extmpcpaper0006.pdf>
- Belke, A. (2010a). Driven by the markets? ECB sovereign bond purchases and the securities markets programme. *Intereconomics*, 45(6), 357-363.
- Belke, A. (2010b). ECB bond purchases and quasi-fiscal activities. *Intereconomics*, 45(3), 134-135.
- Belke, A., & Verheyen, F. (2012). *Sündenfall EZB? Eine kritische Betrachtung der Staatsanleihenkäufe der Europäischen Zentralbank*. Retrieved 28.01.2013, from Bundeszentrale für politische Bildung <http://www.bpb.de/internationales/europa/europa-kontrovers/77075/standpunkt-ansgar-belke-und-florian-verheyen>
- Bénassy-Quéré, A., Coeuré, B., Jacquet, P., & Pisani-Ferry, J. (2010). *Economic policy* (Vol. XII, 709 S. : graph. Darst.). Oxford [u.a.]: Oxford Univ. Press, Oxford [u.a.].
- Berg, T., Carstensen, K., Horn, G., Lamla, M., Sturm, J.-E., Schnabl, G., & Weizsäcker, C. (2012). Funktionswandel der EZB? *Wirtschaftsdienst*, 92(2), 79-94.
- Berleemann, M. (2011). ECB presidency and inflation aversion among the citizens of european countries: an empirical assessment. *CESifo Forum*, 12(2), 88-92.
- Bernanke, B. (1999). *Inflation targeting* (Vol. X, 382 S. : graph. Darst.). Princeton, NJ: Princeton Univ. Press, Princeton, NJ.
- Blanchard, O., & Illing, G. (2009). *Makroökonomie* (Vol. 903 S. : graph. Darst.). München [u.a.]: Pearson Studium, München [u.a.].
- Breitinger, M. (2010). Wie die EZB den Euro retten will, *Zeit Online*. Retrieved 21.01.2013, from <http://www.zeit.de/wirtschaft/2010-05/ezb-rettungsschirm-euro>
- Brockmann, H., & Keppler, H. (2012). EZB-Käufe von Staatsanleihen anders begründen! *Wirtschaftsdienst*, 92(3), 173-176.

- Busch, A. (2006). Die politische Ökonomie der Inflation. In Herbert Obinger, Uwe Wagschal & B. Kittel (Eds.), *Politische Ökonomie* (Vol. 427 S. : graph. Darst.). Wiesbaden: VS, Verl. für Sozialwiss., Wiesbaden.
- BVerfG. (2012). *2 BvR 1390/12 vom 12.9.2012* Retrieved 23.02.2013, from [http://www.bverfg.de/entscheidungen/rs20120912\\_2bvr139012.html](http://www.bverfg.de/entscheidungen/rs20120912_2bvr139012.html)
- Campbell, D. T., & Ross, L. H. (1968). The Connecticut crackdown on speeding: Time-series data in quasi-experimental analysis. *Law & Society Review*, 3(1), 33-54.
- Carrel, P. (2012). Bundesbank chief says ECB bond buying "like a drug". Retrieved 25.02.2013, from [reuters.com](http://www.reuters.com/article/2012/08/26/ecb-bundesbank-bonds-idUSL5E8JQ0RG20120826)  
<http://www.reuters.com/article/2012/08/26/ecb-bundesbank-bonds-idUSL5E8JQ0RG20120826>
- Consensus Economics. (2011). Consensus forecasts. Retrieved 23.02.2013, from Consensus Economics Inc.  
[http://www.uam.es/personal\\_pdi/economicas/sgarcia/cfApr2011.pdf](http://www.uam.es/personal_pdi/economicas/sgarcia/cfApr2011.pdf)
- de Vaus, D. A. (2010). *Research Design in Social Research*. London: SAGE Publications Ltd.
- Deutsche Bundesbank. (2013). Harmonised indices of consumer prices, Time series ICP.M.U2.N.000000.4.ANR. Retrieved 17.02.2013, from [bundesbank.de](http://www.bundesbank.de/Navigation/EN/Statistics/Time_series_databases/ESCB_Time_Series/eszb_details_value_node.html?tsId=ICP.M.U2.N.000000.4.ANR&listId=hicp_coicop_anr_1)  
[http://www.bundesbank.de/Navigation/EN/Statistics/Time\\_series\\_databases/ESCB\\_Time\\_Series/eszb\\_details\\_value\\_node.html?tsId=ICP.M.U2.N.000000.4.ANR&listId=hicp\\_coicop\\_anr\\_1](http://www.bundesbank.de/Navigation/EN/Statistics/Time_series_databases/ESCB_Time_Series/eszb_details_value_node.html?tsId=ICP.M.U2.N.000000.4.ANR&listId=hicp_coicop_anr_1)
- Dornbusch, R., Fischer, S., & Startz, R. (2003). *Makroökonomie*. München: Wissenschaftsverlag.
- Dowideit, M., & Watzlawek, G. (2012). EZB-Rat beschließt unbegrenzte Anleihekäufe, *Handelsblatt*. Retrieved 19.03.2013, from <http://www.handelsblatt.com/politik/konjunktur/geldpolitik/nur-eine-gegenstimme-ezb-rat-beschliesst-unbegrenzte-anleihekaeufer/7102720.html>
- Dreger, C., & Wolters, J. (2011). Money and inflation in the euro area during the financial crisis. *Discussion Paper No. 300*. Retrieved 21.02.2013, from European University Viadrina Frankfurt (Oder) [http://www.wiwi.europa-uni.de/de/forschung/publikationen-projekte/dp/\\_dokumente/300\\_Dreger\\_Wolters.pdf](http://www.wiwi.europa-uni.de/de/forschung/publikationen-projekte/dp/_dokumente/300_Dreger_Wolters.pdf)
- Dullien, S., & Guérot, U. (2012). The Long Shadow of Ordoliberalism: Germany's Approach to the Euro Crisis. London: European Council on Foreign Relations. Retrieved 15.03.2013, from European Council on Foreign Relations [http://ecfr.eu/page/-/ECFR49\\_GERMANY\\_BRIEF.pdf](http://ecfr.eu/page/-/ECFR49_GERMANY_BRIEF.pdf)
- Dullien, S., & Joeßges, H. (2011). Keine Angst vor EZB-Käufen von Staatsanleihen. Retrieved 25.02.2013, from Friedrich-Ebert-Stiftung <http://library.fes.de/pdf-files/id/ipa/08692.pdf>
- ECB. (2003). *Monthly Bulletin June*. Frankfurt am Main.

- ECB. (2009). *Longer-term refinancing operations*. Press Release 07.05.2009. Retrieved 19.01.2013, from [http://www.ecb.int/press/pr/date/2009/html/pr090507\\_2.en.html](http://www.ecb.int/press/pr/date/2009/html/pr090507_2.en.html)
- ECB. (2010a). *ECB announces change in eligibility of debt instruments issued or guaranteed by the Greek government*. Press Release 03.05.2010. Retrieved 19.01.2013, from <http://www.ecb.int/press/pr/date/2010/html/pr100503.en.html>
- ECB. (2010b). *ECB decides on measures to address severe tensions in financial markets*. Press Release 10.05.2010. Retrieved 19.01.2013, from <http://www.ecb.int/press/pr/date/2010/html/pr100510.en.html>
- ECB. (2012). *Technical features of Outright Monetary Transactions*. Press Release 06.09.2012. Retrieved 21.01.2013, from [http://www.ecb.int/press/pr/date/2012/html/pr120906\\_1.en.html](http://www.ecb.int/press/pr/date/2012/html/pr120906_1.en.html)
- ECB. (2013a). Annual growth rate M3, Monthly, Working day and seasonally adjusted, Series Key BSI.M.U2.Y.V.M30.X.I.U2.2300.Z01.A. Retrieved 17.02.2013, from ECB Statistical Data Warehouse [http://sdw.ecb.europa.eu/quickview.do?SERIES\\_KEY=117.BSI.M.U2.Y.V.M30.X.I.U2.2300.Z01.A](http://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=117.BSI.M.U2.Y.V.M30.X.I.U2.2300.Z01.A)
- ECB. (2013b). Base money, Series Key ILM.M.U2.C.LT01.Z5.EUR. Retrieved 19.02.2013, from ECB Statistical Data Warehouse [http://sdw.ecb.europa.eu/quickview.do?SERIES\\_KEY=123.ILM.M.U2.C.LT01.Z5.EUR](http://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=123.ILM.M.U2.C.LT01.Z5.EUR)
- ECB. (2013c). The definition of price stability. Retrieved 17.03.2013, from <http://www.ecb.int/mopo/strategy/pricestab/html/index.en.html>
- ECB. (2013d). ECB Survey of Professional Forecasters, Inflation forecast. Retrieved 17.02.2013, from <http://www.ecb.int> [http://www.ecb.int/stats/prices/indic/forecast/html/table\\_3\\_2013q1.en.html](http://www.ecb.int/stats/prices/indic/forecast/html/table_3_2013q1.en.html)
- ECB. (2013e). The ECB's definition of euro area monetary aggregates. Retrieved 04.02.2013, from <http://www.ecb.int/stats/money/aggregates/aggr/html/hist.en.html>
- ECB. (2013f). Glossary. Retrieved 13.02.2013, from <http://www.ecb.int/home/glossary/html/glossb.en.html> - 467
- ECB. (2013g). M3 in Euro, Monthly, Working day and seasonally adjusted, Series Key BSI.M.U2.Y.V.M30.X.1.U2.2300.Z01.E. Retrieved 17.02.2013, from ECB Statistical Data Warehouse [http://sdw.ecb.europa.eu/quickview.do?SERIES\\_KEY=117.BSI.M.U2.Y.V.M30.X.1.U2.2300.Z01.E](http://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=117.BSI.M.U2.Y.V.M30.X.1.U2.2300.Z01.E)
- ECB. (2013h). Measuring inflation – the Harmonised Index of Consumer Prices. Retrieved 04.02.2013, from <http://www.ecb.int/stats/prices/hicp/html/index.en.html>
- ECB. (2013i). *Monthly Bulletin January*. Frankfurt am Main.
- ECB. (2013j). *Unpublished list of the SMP bond purchases*. Retrieved from [info@ecb.int](mailto:info@ecb.int), e-mail correspondence from 23.01.2013.

- Eckert, D. (2011, 14.01.11). Neue Inflation bedroht die Sparer, *Berliner Morgenpost*. Retrieved 25.02.2013, from <http://www.morgenpost.de/printarchiv/wirtschaft/article1510158/Neue-Inflation-bedroht-die-Sparer.html>
- Eichler, S. (2012). Financial crisis risk, ECB "non-standard" measures, and the external value of the euro. *Quarterly Review of Economics and Finance*, 52(3), 257-265.
- Eichler, S., & Hielscher, K. (2012). Does the ECB act as a lender of last resort during the subprime lending crisis?: Evidence from monetary policy reaction models. *Journal of International Money and Finance*, 31(3), 552-568.
- European Commission. (2006). European Economy. Special Report. Retrieved 12.02.2013, from [http://ec.europa.eu/economy\\_finance/publications/publication\\_summary7570\\_en.htm](http://ec.europa.eu/economy_finance/publications/publication_summary7570_en.htm)
- European Commission. (2007). *User Guide - The Joint Harmonised EU Programme of Business and Consumer Surveys*. Brussels: Retrieved from [http://ec.europa.eu/economy\\_finance/db\\_indicators/surveys/documents/user\\_guide\\_en.pdf](http://ec.europa.eu/economy_finance/db_indicators/surveys/documents/user_guide_en.pdf).
- European Commission. (2013a). Business and Consumer Survey, Time series CONS.EA.TOT.6.BS.M. Retrieved 17.02.2013, from European Commission, Directorate General for Economic and Financial Affairs [http://ec.europa.eu/economy\\_finance/db\\_indicators/surveys/time\\_series/index\\_en.htm](http://ec.europa.eu/economy_finance/db_indicators/surveys/time_series/index_en.htm)
- European Commission. (2013b). *Business and Consumer Survey. Metadata Overview*. Retrieved from [http://ec.europa.eu/economy\\_finance/db\\_indicators/surveys/documents/metadata2/metadata\\_all\\_cons\\_en.pdf](http://ec.europa.eu/economy_finance/db_indicators/surveys/documents/metadata2/metadata_all_cons_en.pdf).
- European Commission ECFIN. (2013). *E-mail correspondence from 12.02.2013*. Retrieved from ECFIN-BCS-MAIL@ec.europa.eu.
- Ewing, J. (2010). Central Bank Buys Billions in European Debt, *The New York Times*. Retrieved 10.12.2012, from <http://www.nytimes.com/2010/05/18/business/global/18ecb.html?pagewanted=print>
- Fahrholz, C. (2012). Monetäre Staatsfinanzierung und europäische Geld(un)ordnung. *Working Papers on Global Financial Markets* (Vol. No. 38). Jena: University Jena.
- Federal Reserve. (2013). U.S. Treasury securities held by the Federal Reserve: All Maturities. Retrieved 27.02.2013, from Economic Research Federal Reserve Bank of St. Louis <http://research.stlouisfed.org/fred2/series/TREAST>
- Felderer, B., & Homburg, S. (1992). *Macroeconomics and New Macroeconomics*. Berlin / Heidelberg: Springer Verlag.
- Gaitanides, C. (2005). *Das Recht der Europäischen Zentralbank* (Vol. XVIII, 315 S.). Tübingen: Mohr Siebeck, Tübingen.



- García, J. A. (2003). An Introduction to the ECB's Survey of Professional Forecasters. *Occasional Paper Series*, 8. Retrieved 27.02.2013, from European Central Bank <http://www.ecb.int/pub/pdf/scpops/ecbocp8.pdf?ebdbdc1aa027468badf7825c24987b99>
- Gerdemesier, D. (2010). *Geldtheorie und Geldpolitik* (Vol. V, 315 S. : graph. Darst.). Frankfurt am Main: Frankfurt-School-Verl., Frankfurt am Main.
- Gerring, J. (2012). *Social Science Methodology*. New York: Cambridge University Press.
- Häring, N., Heß, D., & Maisch, M. (2010). Ist es gut, wenn die EZB Staatsanleihen kauft?, *Handelsblatt*. Retrieved 21.01.2013, from <http://www.handelsblatt.com/finanzen/boerse-maerkte/anleihen/rentenmarkt-ist-es-gut-wenn-die-ezb-staatsanleihen-kauft/3432388.html>
- Homburg, S. (2012). Der neue Kurs der Europäischen Zentralbank. *Wirtschaftsdienst*, 92(10), 673-677.
- Issing, O. (2011). *Einführung in die Geldtheorie* (Vol. IX, 300 S. : graph. Darst.). München: Vahlen, München.
- Johnson, L. E., Ley, R. L., & Cate, T. (2001). Keynes' theory of money and his attack on the classical model. *International advances in economic research*, 7(4), 409-418.
- Kaiser, S. (2011, 09.08.2011). Bond-Buying Perils: ECB Risks Inflation and Loss of Independence, *Spiegel Online*. Retrieved 02.02.2013, from <http://www.spiegel.de/international/europe/bond-buying-perils-ecb-risks-inflation-and-loss-of-independence-a-779183.html>
- Kater, U. (2011). Inflation: Nicht in Sicht oder näher als man glaubt? *ifo Schnelldienst*, 64(14), 16-20.
- Kerber, M. C. (2010). Ankauf von Staatsanleihen durch die EZB: Wie ist die neue Offenmarktpolitik der Europäischen Zentralbank zu bewerten? *ifo Schnelldienst*, 63(21), 3-7.
- Lamla, M., & Sturm, J.-E. (2011). Wie groß ist die Inflationsgefahr? Ein Blick auf die Konsumerwartungen für 2012. *ifo Schnelldienst*, 64(14), 13-16.
- Lamla, M., & Sturm, J.-E. (2012). Die EZB und ihre politische Unabhängigkeit. *Wirtschaftsdienst*, 92(2), 85 - 88.
- Mayer, T. (2011). Stunde der Wahrheit für die EZB. *ifo Schnelldienst*, 64(14), 3-6.
- Mehnert, A., & Nastansky, A. (2012). *Staatsverschuldung und Inflation - Eine empirische Analyse für Deutschland*. Potsdam: Universitätsverlag Potsdam.
- Morgen Stanley. (2012). European Loans & Deposits Tracker. Retrieved 20.02.2013 [http://linkback.morganstanley.com/web/sendlink/webapp/BMServlet?file=0eubknru-3oe4-g000-b98e-001a64f36100&store=0&d=UwBSZXNIYXJjaAA0MzgwNTQ%3D&user=kg4bzuj0m441-219&\\_\\_gda\\_\\_=1467349628\\_7ae6e1ac751c5aeaffb0e0e8240ad7c8](http://linkback.morganstanley.com/web/sendlink/webapp/BMServlet?file=0eubknru-3oe4-g000-b98e-001a64f36100&store=0&d=UwBSZXNIYXJjaAA0MzgwNTQ%3D&user=kg4bzuj0m441-219&__gda__=1467349628_7ae6e1ac751c5aeaffb0e0e8240ad7c8)

- Neyer, U., Hayo, B., & Herr, H. (2010). Neue Geldpolitik der Europäischen Zentralbank? *Wirtschaftsdienst*, 90(8), 503-515.
- Peters, H.-R. (2000). *Wirtschaftspolitik*. München: Oldenbourg Wissenschaftsverlag.
- Petersen, T. (2010). Die gerufenen Geister. *economag.de*, 2010(4). Retrieved 17.03.2013, from Oldenbourg Wissenschaftsverlag  
[http://www.economag.de/pdf/315\\_economag\\_Petersen\\_Apr2010.pdf](http://www.economag.de/pdf/315_economag_Petersen_Apr2010.pdf)
- Plickert, P. (2012, 12.10.2012). Die Inflationserwartungen nehmen zu, *Frankfurter Allgemeine Zeitung*. Retrieved 25.02.2013, from  
<http://www.faz.net/aktuell/wirtschaft/preise-die-inflationserwartungen-nehmen-zu-11923418.html>
- Projektgruppe Gemeinschaftsdiagnose. (2012). Eurokrise dämpft Konjunktur – Stabilitätsrisiken bleiben hoch. Kiel.
- Rabatinova, L. (2013). Germany: Fear of hyperinflation is part of the culture. Retrieved 26.02.2013, from theforeignreport.com  
<http://www.theforeignreport.com/2013/02/21/germany-fear-of-hyperinflation-is-part-of-the-culture/> - .USx3GqUZSIV
- Reuters. (2013). Bank of England should be ready pump out more money, OECD says. Retrieved 07.02.2013, from reuters.com  
<http://www.reuters.com/article/2013/02/06/britain-economy-oecd-idUSL5N0B678R20130206>
- Ribhegge, H. (2011). *Europäische Wirtschafts- und Sozialpolitik*. Berlin, Heidelberg: Springer-Verlag.
- Rooney, B. (2012). ECB outlines bond-buying program, *CNN*. Retrieved 22.01.2013, from <http://money.cnn.com/2012/09/06/investing/ecb-draghi/index.html>
- Sachverständigenrat. (2012). Stabile Architektur für Europa – Handlungsbedarf im Inland. In S. Bundesamt (Ed.), *Jahresgutachten 2012/13*. Wiesbaden.
- Sarrazin, T. (2012). *Europa braucht den Euro nicht* (Vol. 461 S. : graph. Darst.). München: Dt. Verl.-Anst., München.
- Schaper, K. (2001). *Makroökonomie: Ein Lehrbuch für Sozialwissenschaftler*. Frankfurt am Main: Campus Verlag.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalised causal inference*. Wadsworth: Cengage Learning.
- tagesschau.de. (2012). *Inflation frisst großen Teil der Lohnerhöhung auf*. Retrieved 25.02.2013, from tagesschau.de  
<http://www.tagesschau.de/wirtschaft/realloehne100.html>
- Wiese, S. (2010, 11.05.2010). Die Angst vor der Inflation, *stern*. Retrieved 25.02.2013, from <http://www.stern.de/wirtschaft/geld/kampf-um-den-euro-die-angst-vor-der-inflation-1565666.html>

Zeit online. (2012). Rösler: EZB-Staatsanleihenkäufe "keine dauerhafte Lösung", *Zeit Online*. Retrieved 15.03.2013, from <http://www.zeit.de/news/2012-09/03/deutschland-roesler-ezb-staatsanleihenkaeufer-keine-dauerhafte-loesung-03035604>

Zumbrun, J. (2013). *Fed's Bond Buying Pushes Assets to Record \$3 Trillion*. Retrieved 07.02.2013, from [bloomberg.com](http://www.bloomberg.com)  
<http://www.bloomberg.com/news/2013-01-24/fed-pushes-balance-sheet-to-record-3-trillion-on-bond-buying.html>

## Appendix: Tables and Graphs

Table 1: Sovereign Bond Purchases by the ECB

| Date     | Purchased in € | Total in €  | Date     | Purchased in € | Total in €  |
|----------|----------------|-------------|----------|----------------|-------------|
| 14.05.10 | 16500000000    |             | 11.03.11 | 0              | 77335000000 |
| 21.05.10 | 10000000000    | 26500000000 | 18.03.11 | 0              | 77335000000 |
| 28.05.10 | 8500000000     | 35000000000 | 25.03.11 | 432000000      | 77767000000 |
| 04.06.10 | 5500000000     | 40500000000 | 01.04.11 | 0              | 77767000000 |
| 11.06.10 | 6500000000     | 47000000000 | 08.04.11 | 0              | 77767000000 |
| 18.06.10 | 4000000000     | 51000000000 | 15.04.11 | 0              | 77767000000 |
| 25.06.10 | 4000000000     | 55000000000 | 22.04.11 | 0              | 77767000000 |
| 02.07.10 | 4000000000     | 59000000000 | 29.04.11 | 0              | 77767000000 |
| 09.07.10 | 1000000000     | 60000000000 | 06.05.11 | 0              | 77767000000 |
| 16.07.10 | 302000000      | 60302000000 | 13.05.11 | 0              | 77767000000 |
| 23.07.10 | 176000000      | 60478000000 | 20.05.11 | 0              | 77767000000 |
| 30.07.10 | 81000000       | 60559000000 | 27.05.11 | 0              | 77767000000 |
| 06.08.10 | 9000000        | 60568000000 | 03.06.11 | 0              | 77767000000 |
| 13.08.10 | 10000000       | 60578000000 | 10.06.11 | 0              | 77767000000 |
| 20.08.10 | 338000000      | 60916000000 | 17.06.11 | 0              | 77767000000 |
| 27.08.10 | 142000000      | 61058000000 | 24.06.11 | 0              | 77767000000 |
| 03.09.10 | 173000000      | 61231000000 | 01.07.11 | 0              | 77767000000 |
| 10.09.10 | 237000000      | 61468000000 | 08.07.11 | 0              | 77767000000 |
| 17.09.10 | 323000000      | 61791000000 | 15.07.11 | 0              | 77767000000 |
| 24.09.10 | 134000000      | 61925000000 | 22.07.11 | 0              | 77767000000 |
| 01.10.10 | 1384000000     | 63309000000 | 29.07.11 | 0              | 77767000000 |
| 08.10.10 | 9000000        | 63318000000 | 05.08.11 | 0              | 77767000000 |
| 15.10.10 | 0              | 63318000000 | 12.08.11 | 22113000000    | 99880000000 |
| 22.10.10 | 0              | 63318000000 | 19.08.11 | 14291000000    | 1,14171E+11 |
| 29.10.10 | 0              | 63318000000 | 26.08.11 | 6651000000     | 1,20822E+11 |
| 05.11.10 | 711000000      | 64029000000 | 02.09.11 | 13305000000    | 1,34127E+11 |
| 12.11.10 | 1073000000     | 65102000000 | 09.09.11 | 13960000000    | 1,48087E+11 |
| 19.11.10 | 713000000      | 65815000000 | 16.09.11 | 9793000000     | 1,5788E+11  |
| 26.11.10 | 1348000000     | 67163000000 | 23.09.11 | 3952000000     | 1,61832E+11 |
| 03.12.10 | 1965000000     | 69128000000 | 30.09.11 | 3795000000     | 1,65627E+11 |
| 10.12.10 | 2667000000     | 71795000000 | 07.10.11 | 2312000000     | 1,67939E+11 |
| 17.12.10 | 603000000      | 72398000000 | 14.10.11 | 2243000000     | 1,70182E+11 |
| 24.12.10 | 1121000000     | 73519000000 | 21.10.11 | 4490000000     | 1,74672E+11 |
| 31.12.10 | 164000000      | 73683000000 | 28.10.11 | 4000000000     | 1,78672E+11 |
| 07.01.11 | 113000000      | 73796000000 | 04.11.11 | 9520000000     | 1,88192E+11 |
| 14.01.11 | 2313000000     | 76109000000 | 11.11.11 | 4478000000     | 1,9267E+11  |
| 21.01.11 | 146000000      | 76255000000 | 18.11.11 | 7986000000     | 2,00656E+11 |
| 28.01.11 | 0              | 76255000000 | 25.11.11 | 8581000000     | 2,09237E+11 |
| 04.02.11 | 0              | 76255000000 | 02.12.11 | 3662000000     | 2,12899E+11 |
| 11.02.11 | 0              | 76255000000 | 09.12.11 | 635000000      | 2,13534E+11 |
| 18.02.11 | 711000000      | 76966000000 | 16.12.11 | 3361000000     | 2,16895E+11 |
| 25.02.11 | 369000000      | 77335000000 | 23.12.11 | 19000000       | 2,16914E+11 |

## The Purchase of State Bonds by the ECB – is the Euro Zone Threatened by Inflation?

|                 |            |             |                 |           |             |
|-----------------|------------|-------------|-----------------|-----------|-------------|
| <b>04.03.11</b> | 0          | 77335000000 | <b>30.12.11</b> | 462000000 | 2,17376E+11 |
| <b>06.01.12</b> | 1104000000 | 2,1848E+11  | <b>28.09.12</b> | 0         | 2,24762E+11 |
| <b>13.01.12</b> | 3766000000 | 2,22246E+11 | <b>05.10.12</b> | 0         | 2,24762E+11 |
| <b>20.01.12</b> | 2243000000 | 2,24489E+11 | <b>12.10.12</b> | 0         | 2,24762E+11 |
| <b>27.01.12</b> | 630000000  | 2,24552E+11 | <b>19.10.12</b> | 0         | 2,24762E+11 |
| <b>04.02.12</b> | 1240000000 | 2,24676E+11 | <b>26.10.12</b> | 0         | 2,24762E+11 |
| <b>11.02.12</b> | 590000000  | 2,24735E+11 | <b>02.11.12</b> | 0         | 2,24762E+11 |
| <b>18.02.12</b> | 0          | 2,24735E+11 | <b>09.11.12</b> | 0         | 2,24762E+11 |
| <b>25.02.12</b> | 0          | 2,24735E+11 | <b>16.11.12</b> | 0         | 2,24762E+11 |
| <b>02.03.12</b> | 0          | 2,24735E+11 | <b>23.11.12</b> | 0         | 2,24762E+11 |
| <b>09.03.12</b> | 270000000  | 2,24762E+11 | <b>30.11.12</b> | 0         | 2,24762E+11 |
| <b>16.03.12</b> | 0          | 2,24762E+11 | <b>07.12.12</b> | 0         | 2,24762E+11 |
| <b>23.03.12</b> | 0          | 2,24762E+11 | <b>14.12.12</b> | 0         | 2,24762E+11 |
| <b>30.03.12</b> | 0          | 2,24762E+11 | <b>21.12.12</b> | 0         | 2,24762E+11 |
| <b>06.04.12</b> | 0          | 2,24762E+11 | <b>28.12.12</b> | 0         | 2,24762E+11 |
| <b>13.04.12</b> | 0          | 2,24762E+11 | <b>04.01.13</b> | 0         | 2,24762E+11 |
| <b>20.04.12</b> | 0          | 2,24762E+11 | <b>11.01.13</b> | 0         | 2,24762E+11 |
| <b>27.04.12</b> | 0          | 2,24762E+11 | <b>18.01.13</b> | 0         | 2,24762E+11 |
| <b>04.05.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>11.05.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>18.05.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>25.05.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>01.06.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>08.06.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>15.06.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>22.06.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>29.06.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>06.07.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>13.07.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>20.07.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>27.07.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>03.08.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>10.08.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>17.08.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>24.08.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>31.08.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>07.09.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>14.09.12</b> | 0          | 2,24762E+11 |                 |           |             |
| <b>21.09.12</b> | 0          | 2,24762E+11 |                 |           |             |

(Data source: own calculations  
based on ECB, 2013j)

**Table 2: Balance Sheet of the ECB (simplified)****Assets**

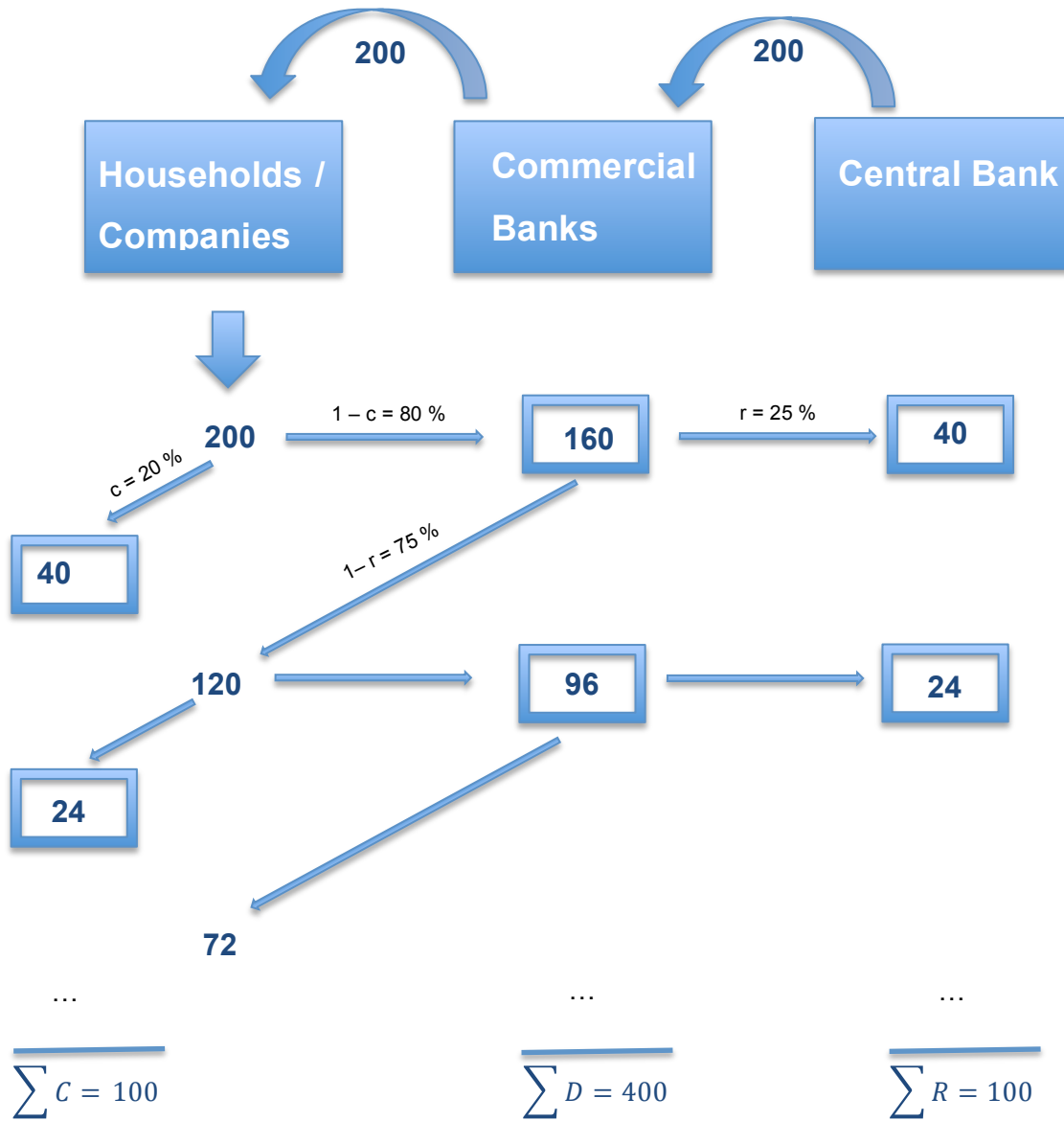
- Currency reserves (CR)
- Loans to commercial banks (LB)
- Securities (S)

**Liabilities**

- Cash in circulation (CC)
- Deposits of credit institutions (DC)

(Data source: own illustration based on Issing, 2011, p. 54)

Table 3: Money Creation of Commercial Banks



c: cash quota; r: reserve ratio; C: cash money; D: deposits; R: minimum reserve

(Data source: own illustration based on Anderegg, 2007)

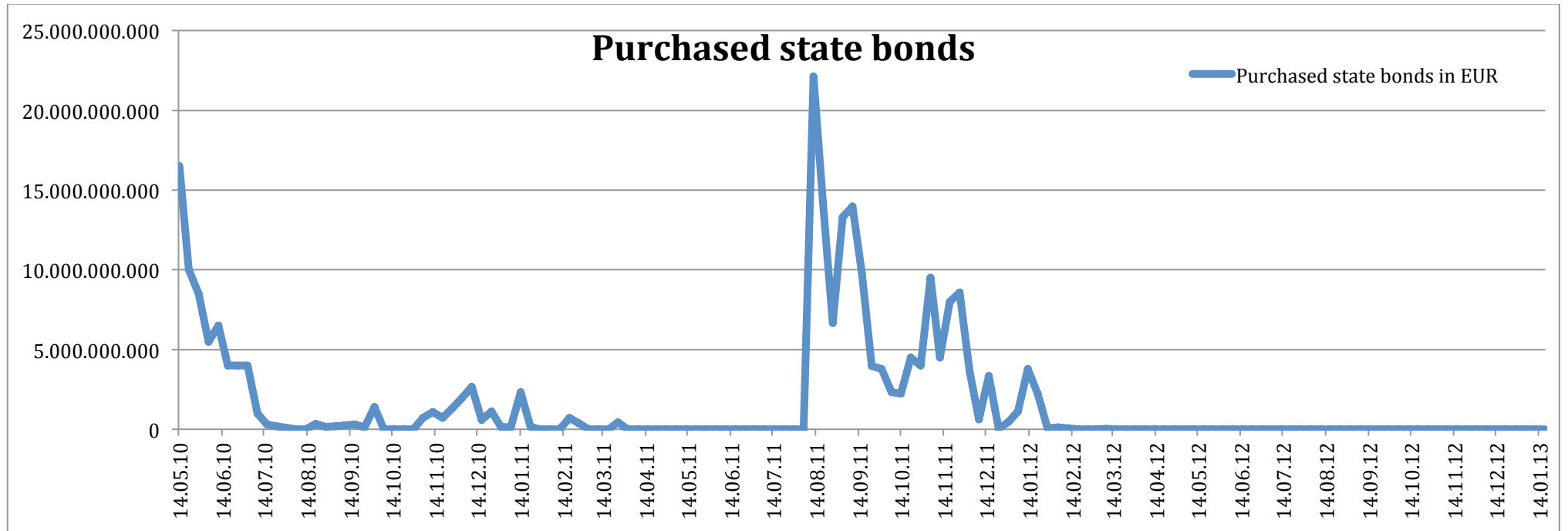
**Table 4: Inflation Forecast**

| Year                  | Consumer Prices ECB<br>2013 - 2017 | Consumer Prices Consensus Economics<br>2013 - 2021 |
|-----------------------|------------------------------------|--|
| <b>2013</b>           | <b>1,8</b>                         | <b>1,7</b>   |
| <b>2014</b>           | 1,8                                | 1,9  |
| <b>2015</b>           | 1,9                                | 2,1  |
| <b>2016</b>           | –                                  | 2,3  |
| <b>2017</b>           | 2,0                                | –  |
| <b>2017-<br/>2021</b> | –                                  | 2,2  |

(Data source: own illustration based on Consensus Economics, 2011; ECB, 2013d)

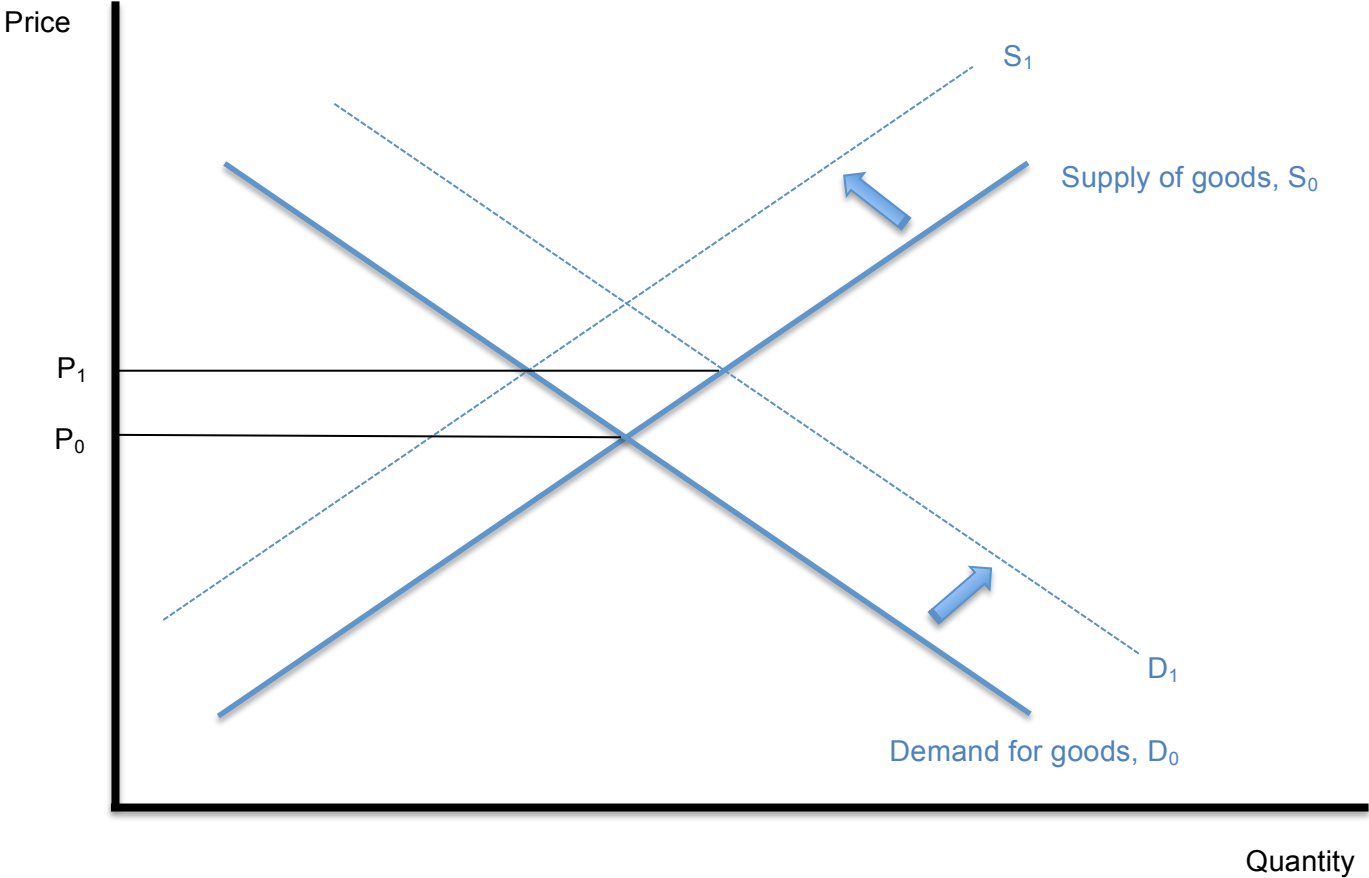


**Graph 1: Purchased State Bonds by the ECB**



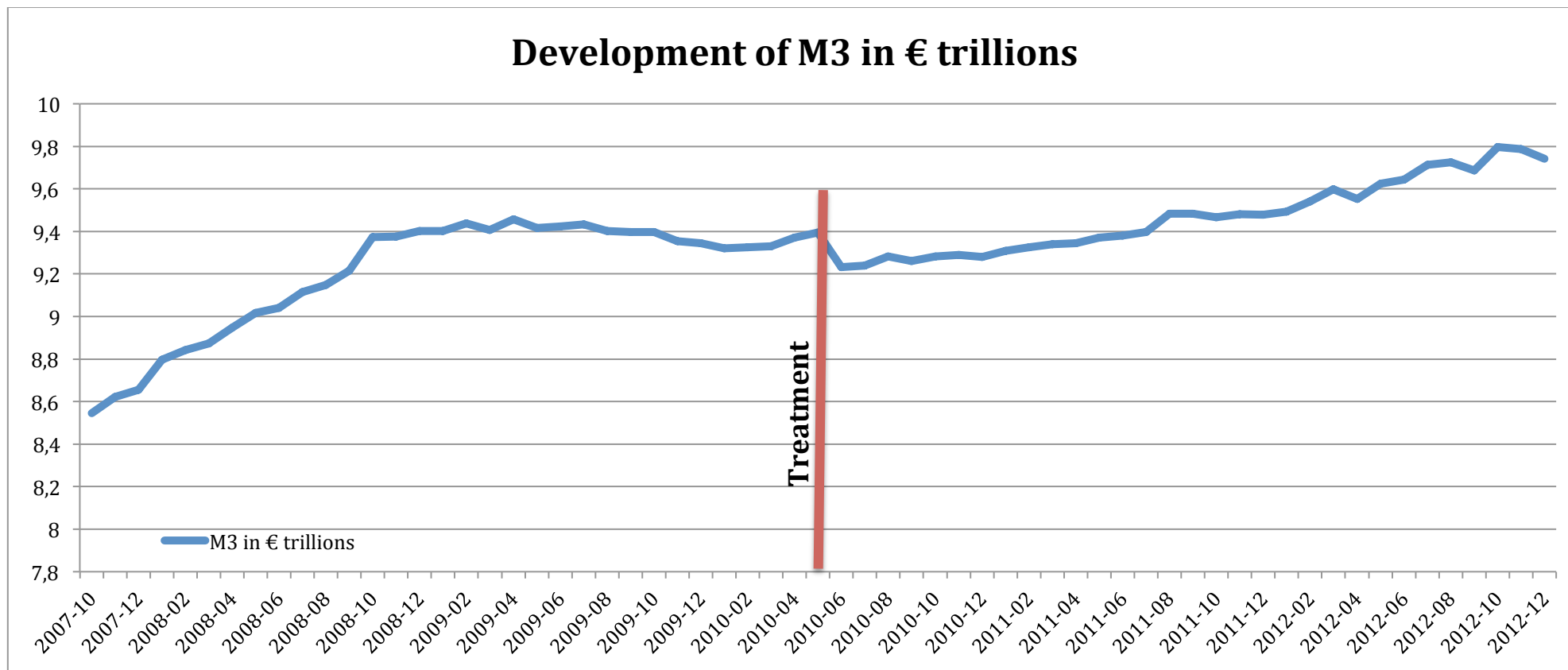
(Data source: own illustration based on ECB, 2013j)

Graph 2: Supply and Demand



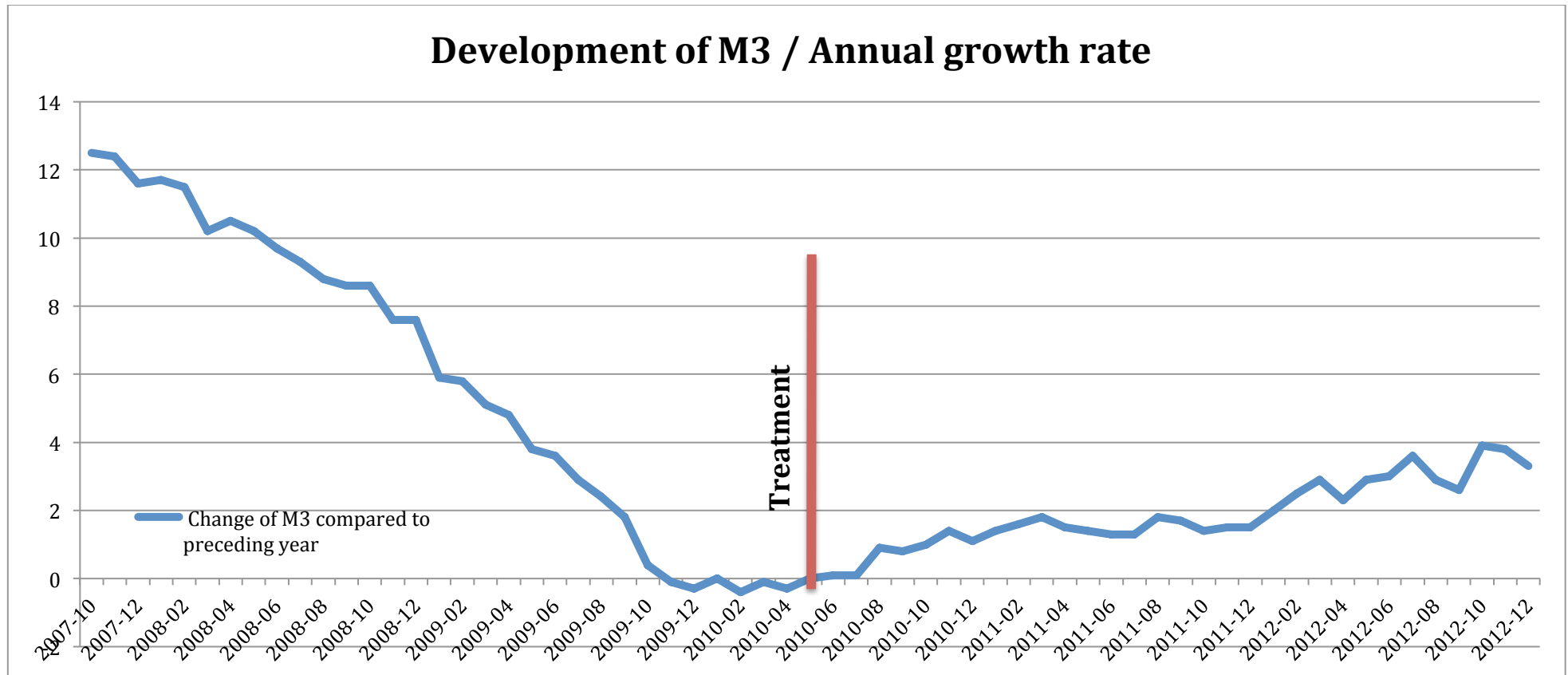
(Data source: own illustration based on Petersen, 2010)

**Graph 3: Absolute Development of M3**



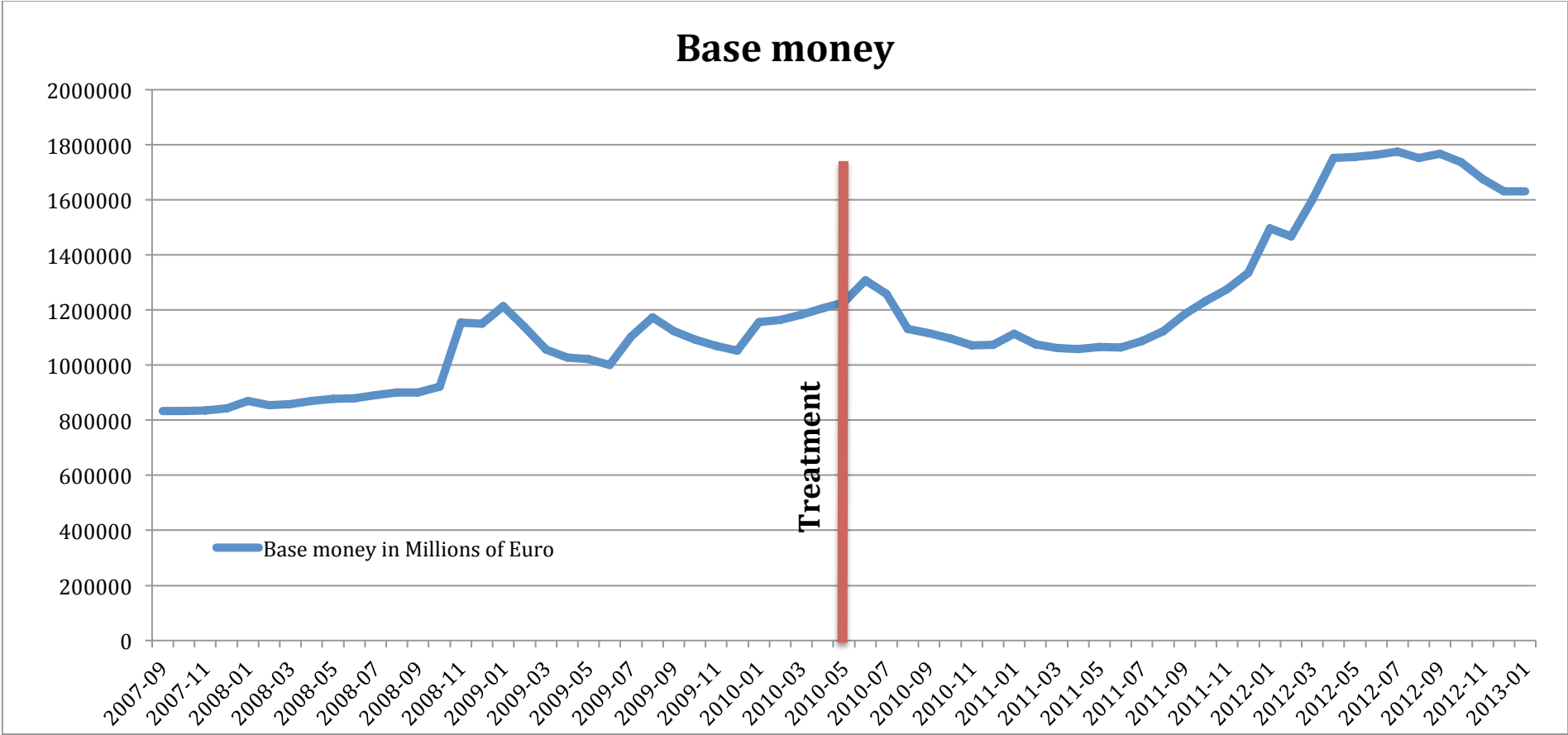
(Data source: own illustration based on ECB, 2013g)

Graph 4: Annual Growth Rate of M3



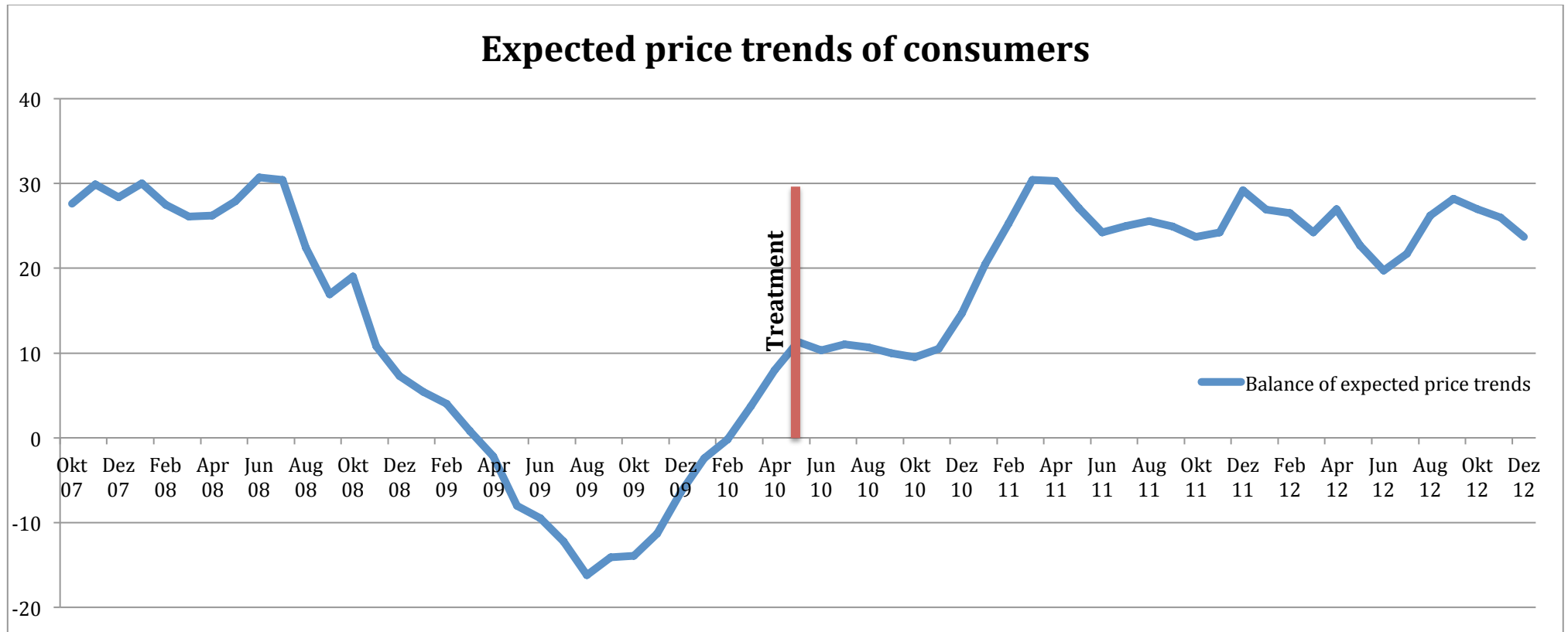
(Data source: own illustration based on ECB, 2013a)

Graph 5: Development of Base Money



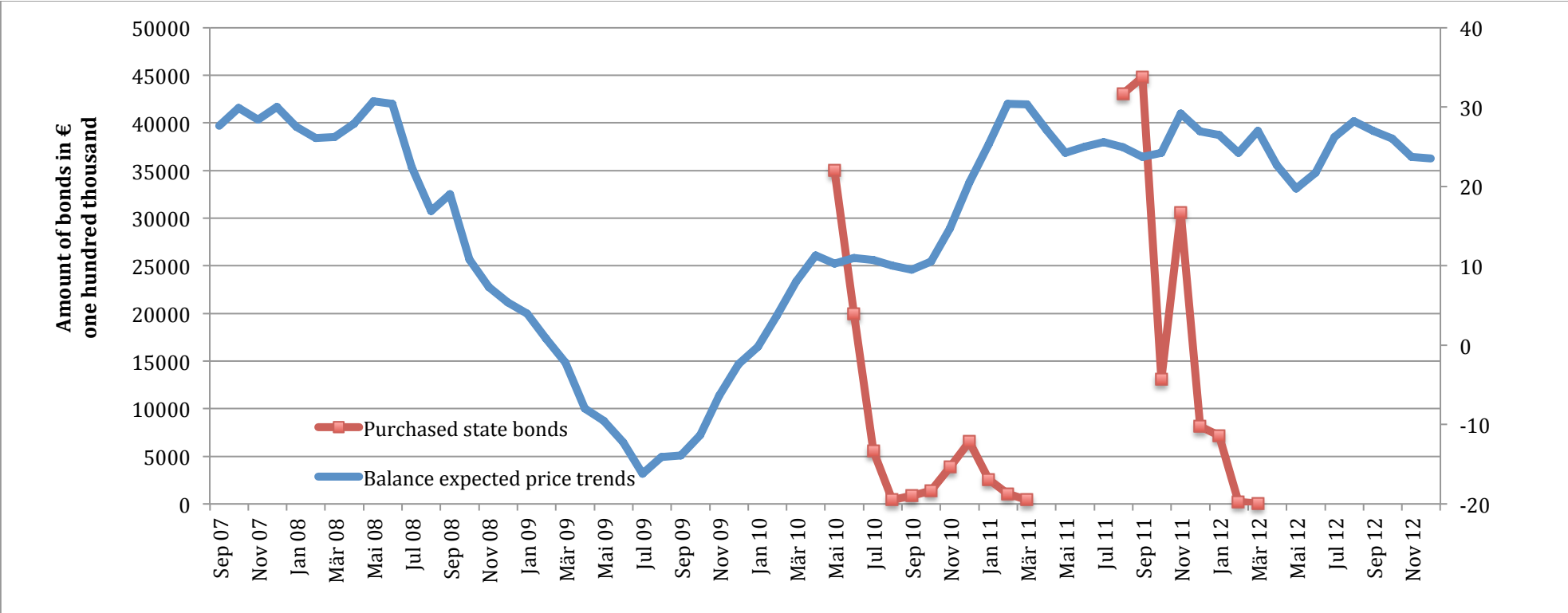
(Data source: own illustration based on ECB, 2013b)

Graph 6: Inflation Expectations



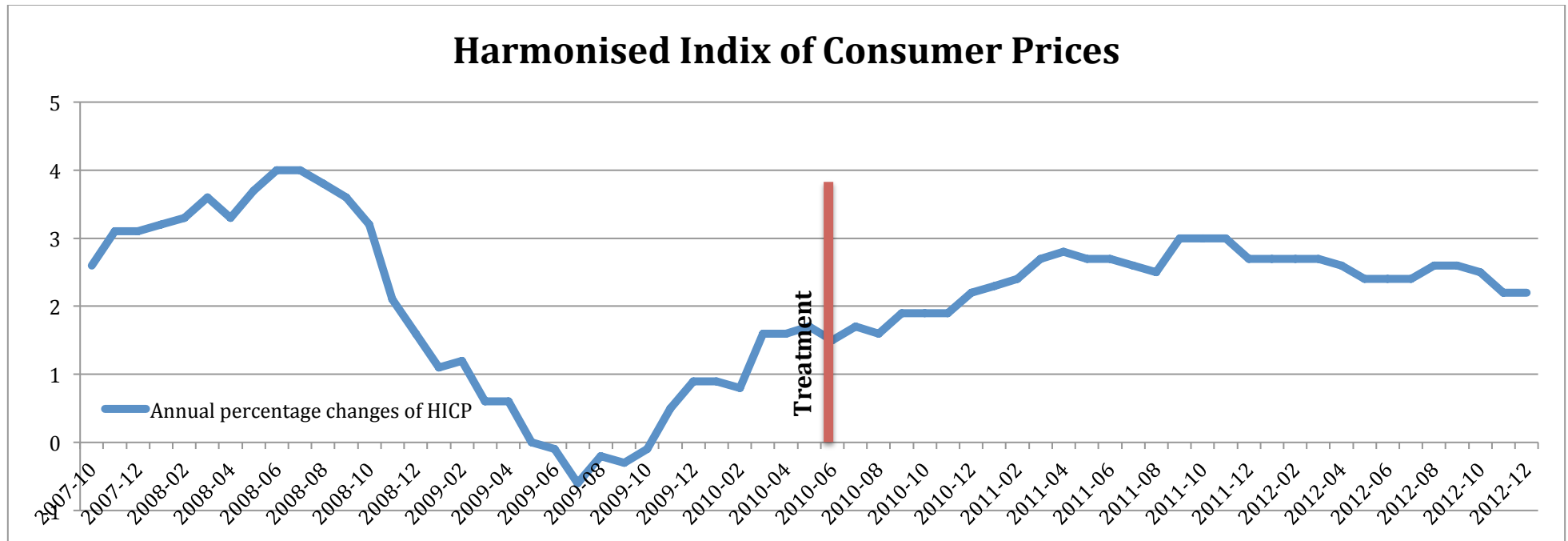
(Data source: own illustration based on European Commission, 2013a)

**Graph 7: Bond Purchases vs Inflation Expectations**



(Data source: own illustration based on ECB, 2013j; European Commission, 2013a)

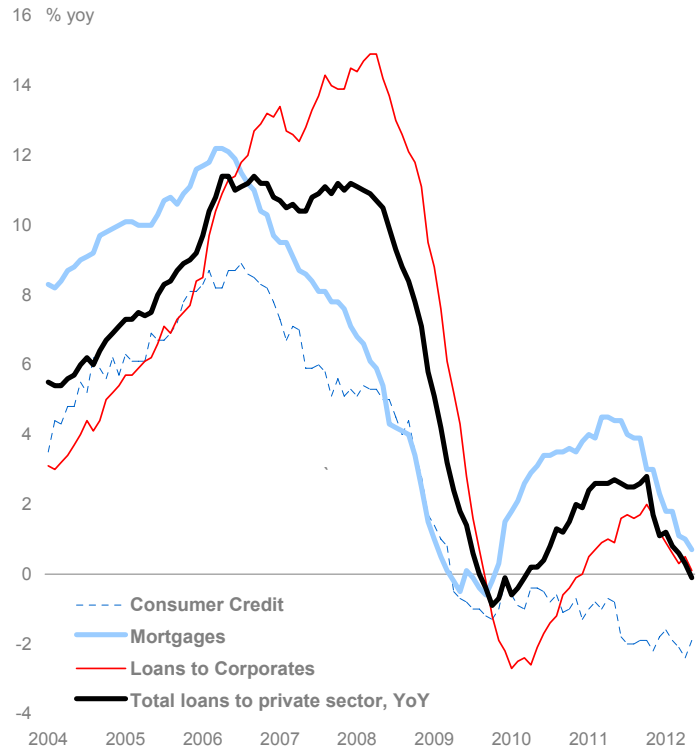
Graph 8: Inflation Rate



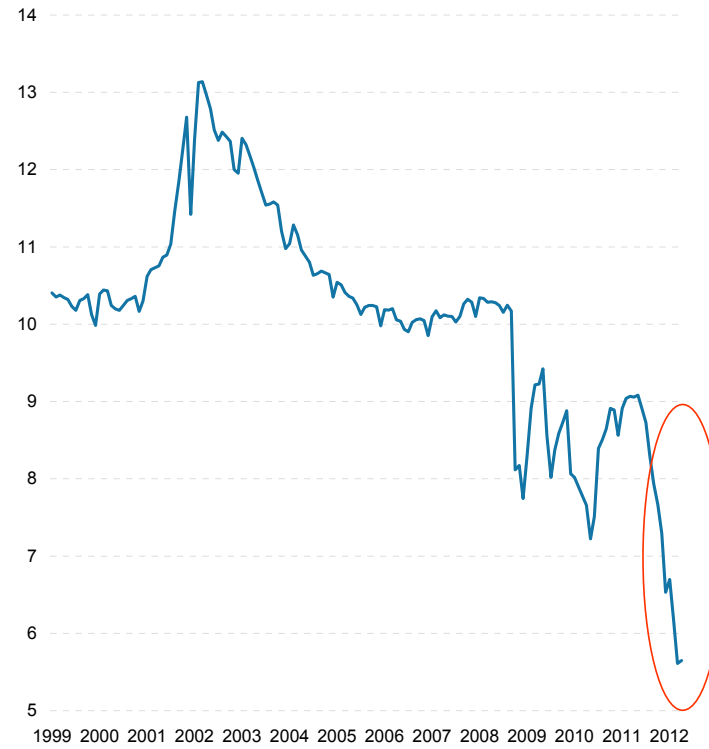
(Data source: own illustration based on Deutsche Bundesbank, 2013)



**Graph 9: Loans to Private Sector / Money Multiplier**



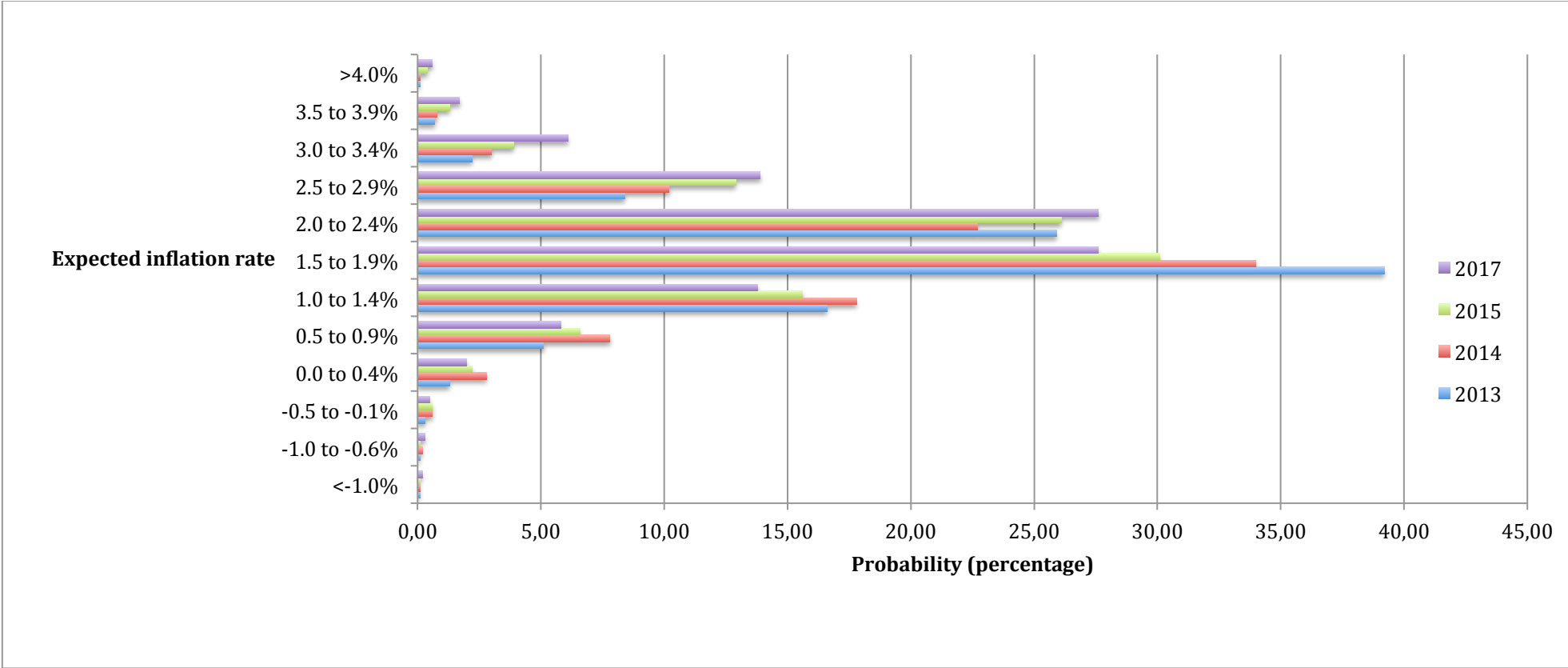
Left-hand side: growth of the loans to the private sector (black curve)



Right-hand side: money multiplier calculated as: M3 money supply / total base money

(Data source: Morgan Stanley, 2012)

**Graph 10: Probability Distributions of ECB Inflation Forecast**



(Data source: own illustration based on ECB, 2013d)