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School of Economics and Management

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The ECB's Dilemma in View of the European Monetary Union: The Case of Germany and Spain

Katharina Allinger

Katharina.allinger.671@student.lu.se

Abstract: In the post-crisis environment the discussion about the optimal monetary policy in the Euro Area (EA) is an important topic. A number of scholars have argued that a big part of the problem of the EA is the currency union, because Europe is too heterogeneous for a currency area. This paper asks what impact the existence of the currency union has had on the effectiveness of monetary policy in the EA by comparing the cases of Germany and Spain. It puts a particular emphasis on the trade-offs the ECB faces in the current situation when choosing its monetary policy by discussing the different needs of Germany and Spain. The theoretical review and empirical analysis in this thesis confirm that the existence of the monetary union has contributed to substantial imbalances within Europe due to the fact that there is no one-size fits all monetary policy. Moreover, the existence of the monetary union has important effects on the policy choice of the ECB in the post-crisis situation. The empirical analysis shows that monetary policy has become a dangerous balancing act between preventing unsustainable expansions in some countries and dragging down growth in others.

Key Words: Monetary Policy, Euro Area, Financial Stability

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1 Introduction

This thesis adds to the literature on the impacts of the European Monetary Union (EMU)¹ on the effectiveness of monetary policy in Europe. Given that there is currently little political will to dissolve the currency union, this paper focuses on the dilemma the existence of the currency union creates for the European Central Bank (ECB) in setting its monetary policy. The question this thesis sets out to answer is how the heterogeneity of the EA member states is affecting the trade-offs the ECB has to make in the post-crisis environment. The heterogeneity of the EA is captured by looking at the development of two large and economically important countries: Germany and Spain. This topic is extremely relevant in the current context: In June 2014, weak growth prospects and falling inflation in the Euro Area (EA) have raised the pressure on the European Central Bank (ECB) to pursue further expansionary monetary policies (e.g. Jones, 2014). This recent development is only a small part of an ongoing discussion about the appropriate monetary policy stance in the post-financial-crisis environment in the EA. The existence of the European Monetary Union (EMU) has played an important role in this debate, given that it implies that there is only one monetary policy for a group of very distinct countries. In the presence of heterogeneity there is no one-size-fits-all approach to monetary policy, rather it is associated with making trade-offs between the needs of individual countries (e.g. Johansson & Ljungberg, 2013). This theory has been supported by the very distinct developments of the economies of the “core” and “periphery” countries of the EA presented in the chapter 3 of this thesis. The empirical analysis demonstrates that these trade-offs create a substantial dilemma for the ECB in the post-crisis environment as it has to balance the needs for further monetary expansion with those for monetary restrictions in the presence of an economically and financially unstable situation.

Chapter 3 of the thesis sets out the framework and reviews the theoretical implications of currency unions and when and how they function or don't function. It gives an overview over this branch of the literature and shows that there is much supporting evidence for this claim. The empirical analysis is largely presented in the last sections of chapter 3 and the entire chapter 4. Section 4 starts from the assumption that there is currently little political will to abandon the single currency, and

¹ Note that the abbreviation EMU is often used for the „Economic and Monetary Union“, which includes all EU member states. Here the term EMU is used as „European Monetary Union“ and is thus synonymous to the term EA.

therefore looks in more depth at the risks and concerns the ECB has to balance as long as the monetary union exists. The ECB currently has three choices: pursue expansionary or restrictive policies or leave its policies unchanged – each of which is discussed by presenting evidence from Germany and Spain. Using these heterogeneous countries serves to illustrate that the most crucial dilemmas that the ECB is currently facing stem from the heterogeneity of the currency union. This thesis has two main goals: on the one hand it adds to the growing literature that points out the severe implications the EMU has for the European economies. On the other hand, it illustrates the contemporary situation in the EA and links the EMU with the trade-offs associated with choosing a monetary policy stance in the current environment.

2 Data and Method

It is the aim of this paper to provide some answers regarding the impacts of the EMU on the effectiveness of monetary policy in the post-crisis environment. Due to limitations of scope and time this thesis focuses on a number of aspects that seem particularly relevant in this context. Firstly, the EA currently consists of eighteen EU member states: Belgium, Germany, Ireland, Spain, France, Italy, Luxembourg, The Netherlands, Austria, Portugal, Finland (since 1999), Greece (since 2001), Slovenia (since 2007), Cyprus and Malta (since 2008), Slovakia (since 2009), Estonia (since 2011) and Latvia (since 2014).² The currency union formed by these countries is referred to as the EMU throughout this thesis. These countries are very heterogeneous and while it would be interesting to study all of them, this is rather impractical and the empirical analysis therefore focuses on Germany and Spain. On the one hand, both countries are large and economically significant EA members. On the other hand, Germany belongs to what has been referred to as the “core”, while Spain belongs to the “periphery”. Since the financial crisis, the words “core” and “periphery” have been widely used to distinguish the countries that came under severe financial distress in the crisis (Greece, Italy, Portugal, Ireland and Spain) from those less troubled, e.g. Germany. Using one country from each group has the benefits that it becomes easier to interpret the data. Secondly, to keep the analysis tractable it is focused the business and investment side and does not provide evidence on households and consumption. Among non-financial corporations (NFCs) there is a particular focus on SMEs (Small and Medium-Sized Enterprises), since they make up

² Whenever this thesis refers to EA (changing composition) it refers to the fact that more countries are included in the macroeconomic series as they joined the EA.

approximately 99% of all businesses in the Euro Area (EA), depend largely on bank finance and have been more severely hit during the financial crisis than large businesses (Gagliardi et al., 2013). The vulnerability of SME's to credit constraints has been demonstrated by a number of studies (e.g. Gertler & Gilchrist, 1994; Kashyap et al., 1994).

The macroeconomic data used stems from three main sources. The Eurostat database, the European Central Bank's Statistical Data Warehouse and, where necessary, data from national institutions and publications. In addition, this thesis uses firm micro-data from the “Survey on the Access to Finance of Small- and Medium-Sized Businesses” (SAFE). The SAFE has been conducted by the ECB and the European Commission since 2009. It is a semi-annual survey with the aim to provide the EU bodies with information regarding the financial constraints of firms in Europe. There are two types of waves of the survey: the ECB waves include a representative sample of firms from a selected number of Euro countries, while the common waves include all EU and some neighbouring countries (Table I, Appendix). For Spain and Germany the survey includes information on approximately 1000 firms each half-year, whereas the number of observations for the EA range between 5.000 and 8.500 observations each half-year. The analysis in this thesis focuses exclusively on the data for SMEs between 2010-2013.³ Tables II-V (Appendix) provide detailed information on the number of observations for each wave and country, summary statistics and a correlation matrix for the variables used in the empirical analysis.⁴ The survey has some severe limitations. On the one hand, there are standard concerns associated with any survey which asks individuals to self-report on a number of indicators. The data from these surveys is always subject to a certain bias and inaccuracy. On the other hand, the topic of the SAFE is highly sensitive as banks and firms have an incentive to protect information about their financial situation and relations. The SAFE questionnaire is therefore cautiously worded and mostly contains categories instead of accurate figures and only information on the direction of changes, but not the size of these changes. For these reasons, the SAFE does not suggest itself for rigorous econometric analysis. Nonetheless, the information the survey contains regarding credit availability and conditions from a firm perspective, can be used to shed some light on the importance and severity of financial constraints for firms.

3 Given the low sample size and substantial differences between the questionnaires and survey conduct, the data from 2009 are excluded.

4 More detailed information on sampling, stratification and weights is available on <http://www.ecb.europa.eu/stats/money/surveys/sme/html/index.en.html>

3 The European Monetary Union

The Euro was launched in 1999 as part of the bigger project of an Economic and Monetary Union in Europe. Originally eleven EU member states joined the EMU. Since then the number has grown to eighteen states that use the common currency and whose monetary authority is the ECB (ECB, 2014a). Each of these countries has different institutional structures and histories and therefore different macroeconomic trajectories. Therefore the EMU implementation process was dominated by the question whether the EA was in fact an Optimum Currency Area (OCA). The concept of the OCA and its application to the EA makes up the main part of this section. Section 3.3 discusses the framework and tools of the ECB. Section 3.4. and 3.5. provide some empirical analysis on how the common monetary policy has compared to the needs of the EA countries.

3.1 The Theory of Optimum Currency Areas

The concept of Optimum Currency Areas (OCA) was first developed by Mundell (1961), who argued that an OCA is a region, not necessarily a nation, where the benefits of a common currency are larger than the costs. The main benefit of a currency union is the reduction in transaction costs associated with the abolishment of national currencies. Moreover, small, open economies in particular can have additional benefits. On the one hand, many smaller economies may often not be able to provide certain public goods, such as currencies, as efficiently as larger countries (Alesina et al., 2002). On the other hand, if they have governance problems adopting the currency of a larger trading partner can ensure macroeconomic stability. They may be able to benefit from the credibility of the central bank (CB) of a low-inflation country like the US. In theory, a fixed exchange rate regime could achieve the same effects – in practise, it is less permanent and therefore less credible (Alesina & Barro, 2002). The main cost of a currency union is that countries lose their individual ability to counter idiosyncratic shocks via monetary policy. This impossibility is best understood in terms of the policy trilemma of open economies. It states that a country cannot simultaneously have (1) free capital flows, (2) a fixed exchange rate and (3) a monetary policy directed towards national goals (Obstfeld et al., 2005). In a currency union the former two apply, which means that the latter cannot. This clearly comes at a cost for the country, because it may be confronted with sub-optimal monetary conditions such as too high interest rates that constrain output growth. There are three scenarios that can be distinguished: a currency union with a single currency, a currency union with

fixed exchange rates, but more than one currency and a situation of flexible exchange rates, meaning no currency union.

Mundell (1961) illustrates the difference between the former two with an example of two countries that are hit by a demand shock, which shifts demand between the two areas, for instance from country A to B. In both cases a shift in demand increases unemployment in country A and inflationary pressures in country B. Without a currency union, but with fixed exchange rates, the adjustment process now depends on the willingness of B to allow inflation. If B does allow prices to rise, this erodes some of its competitiveness in international markets and allows for a re-balancing of the trade-relationship between country B and country A. If country B suppresses the rise in prices, the burden of adjustment falls fully on country A, which needs to increase its competitiveness by decreasing its costs or enhancing its productivity. In a currency union with a single currency there is only one monetary policy. The supra-regional authority faces a trade-off: if it pursues expansionary policies, it alleviates the unemployment problems in Spain, but increases inflationary pressures in B and deteriorates its competitiveness. If it tightens monetary policy to reduce inflation in B, it worsens the unemployment problem in A. The paths of inflation and short-term fluctuations in output and unemployment are therefore determined by the preferences of the monetary authority to tolerate unemployment and/ or inflation in the currency union. With flexible exchange rates, part of the adjustment mechanism between two countries occurs via the exchange rate. Using the example of the demand shift from A to B, output is reduced in A, creating lower inflation expectations. This induces the national central bank to lower interest rates, which leads to a lower demand for the domestic currency, which depreciates. The relationship between short-term rates and the exchange rate is often described as “interest rate parity”. It states that the difference between the interest rates of two countries equals the expected rate of change of the exchange rate between the same countries (Krugman et al., 2011). Empirically there are some deviations from the interest parity relationship, but the relationship holds roughly (Taylor, 1995). The depreciation of the A's currency induced by the interest changes increases the demand for domestic products and helps to restore the equilibrium between the two countries. Flexible exchange rates therefore help the adjustment mechanism back to equilibrium.

Deciding whether a region is an OCA therefore implies weighing the benefits of the currency union against the adverse effects of having to rely on one monetary policy. The literature since Mundell

(1961) has identified four main factors that increase likelihood that a region is an OCA: trade integration, the correlation of business cycles and similarity of shocks, the degree of labour mobility and the extent of risk-sharing similar to a fiscal union within the area (Alesina & Barro, 2002; Frankel & Rose, 1998). If these factors apply, then the regions in the OCA are affected by the same shocks and these shocks have similar effects in each economy. In addition labour mobility and federal structures help to secure adjustment in the face of imbalances. These conditions imply that it is possible to conduct sensible monetary policy for the whole area. However, OCA theories do not provide a clear-cut recommendation which regions should be monetary unions and which shouldn't. Decisions have therefore often been based on a comparison of the currency area in question with existing currency areas. Eichengreen (1991), for instance, concludes that the EA is less of an OCA than either Canada or the US. A number of scholars have argued that an examination of this type is not suited to decide whether regions should form a monetary union, because factors such as trade integration and harmonised business cycles are endogenous. This implies that neither a status-quo nor a historical comparison can give a satisfactory answer to the question whether a number of countries form an OCA. Instead the formation of a currency union increases economic integration and trade links between the participating countries: large number of empirical studies has attempted to investigate this theory (see Alesina et al., 2002 for a review). However, it remains at best controversial, whether currency unions really have large tangible effects on increasing the four factors identified above.

3.2 The Evolution of the Optimum Currency Area in Europe

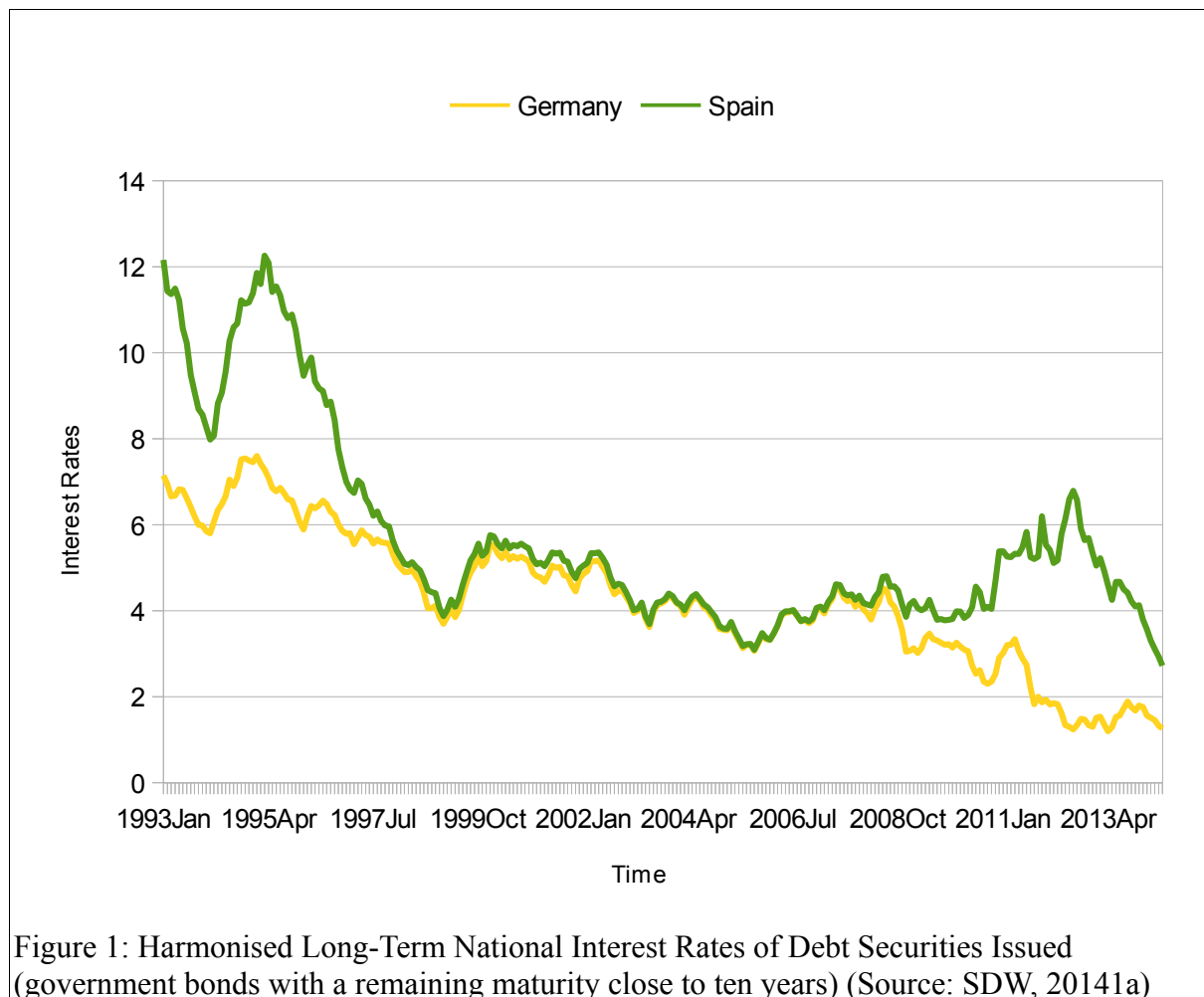
When the EMU was launched in 1999 there was still considerably heterogeneity between the member countries, despite the fact that membership in the EMU was subject to a number of criteria: To be eligible to enter to currency union (1) the inflation rate had to be maximum 1.5 percent above the inflation rate of the three best-performing states, (2) the nominal interest rate maximum 2 percent above and countries had to comply with a number of fiscal restrictions as well. It was hoped that further European integration would increase the benefits of having a currency union over time (Lane, 2006), even though authors warned that there was a large risk that the EMU could lead to large structural imbalances (e.g. Eichengreen, 1991). A number of studies have attempted to assess whether the EMU has indeed contributed to convergence or been the cause of divergence within the EA. It should be noted that much of the evidence cited in this section is preliminary in the sense that

it is often difficult to conduct empirical tests due to a variety of confounding factors and a lack of available data, particularly for the pre-EMU period. Studies therefore often have to focus on areas, where changes are expected to occur quickly and data is available (Angeloni & Ehrmann, 2003; De Grauwe & Mongelli, 2005).

On the positive side, some studies find evidence for increased economic and financial integration and the harmonisation of business cycles (Alesina et al., 2002; De Grauwe & Mongelli, 2005; Lane, 2006; Micco et al., 2003). Mildly positive evidence also comes from Angeloni & Ehrmann (2003), who look at the monetary transmission mechanism (MTM), which describes and measures the links between monetary policy and real variables. They find that the MTM in the member states has become more homogeneous and conclude that in most countries the pass-through of money rates to bank rates has increased in the EA, except in Germany. The pass-through refers to how quickly banks adjust the nominal rates for borrowers and depositors to changes in monetary policy. The main policy rate in the EA is the rate on the main refinancing operations (MROs), which are weekly loans allocated through a bidding process to banks in need of short-term finance. The ECB controls the interest rates in these auctions either by holding fixed rate auctions or setting a minimum bid rate (ECB, 2011). The MRO rate is then passed on to the EONIA (Euro Overnight Index Average) and other short-term market interest rates. The faster and more accurate the adjustment of short-term market and bank interest rates to changes in monetary policy is, the more control does the ECB have over the economic conditions in the EA (ECB, 2010). (see Figure 10). Angeloni and Ehrmann (2003) also find that the maturity structures of bank loans have become more homogeneous – especially as the fall in the level and the variability of inflation in countries like Spain and Italy has reduced uncertainty and led to a lengthening of the loan maturities.

On the other hand there are some indications that the common currency has contributed to macroeconomic divergence of the EA countries. Firstly, it has had an asymmetric effect on the nominal interest rates. Periphery countries have benefited more than core countries and have seen their external risk premia fall. This has been linked to the recent booms in house and asset prices. Being part of the EA acted as a kind of insurance for investors, who tolerated an increase in the current account deficits of Spain, Greece and Portugal without considerable risk premia (Lane, 2006). Figure 1 illustrates the effect: it shows that since the implementation of the EMU the yields of government bonds issued by Germany and Spain have been fairly similar. It took the financial

crisis to show that this risk assessment was clearly dubious, which is why long-term interest rates on Spanish securities have risen during the crisis.



Secondly, higher inflation rates in these countries plus a exogenously given nominal interest rate imply a divergence of real interest rates across countries. This contributes to different growth trajectories, which should have led to higher wages and costs and thus inflation and the stabilizing mechanism via international trade outlined above. As discussed, absent flexible exchange rates, differences in productivity or the absorption of shocks reflect themselves in differing inflation rates. However, since 1999 the difference in average inflation rates between the lowest (Germany) and highest (Ireland) inflation country have moved in a range of 2-4 percent, with the majority of the difference stemming from service sector prices. Finally, a monetary union implies a common nominal exchange rate. Not all member countries are equally sensitive to changes to this exchange

rate due to monetary changes or external shocks. Other things equal the introduction of a common currency will therefore introduce an asymmetry between comparatively outwards-open and more inwards-focused countries. There is evidence that this has occurred within the EA (Lane, 2006). It should be noted that the EMU was not only an economic, but also a political project. The EMU was supposed to foster political integration within Europe. Unfortunately public support for the EMU was already weak before the crisis: in a survey only a slight majority of Europeans reported that they thought that the introduction of the Euro has been overall positive (Lane, 2006). The political and economic success of the EMU are strongly interlinked: Feldstein (1997), for instance, warned that a pre-mature introduction of the Euro might endanger European integration, rather than fostering it.

3.3 The Framework and Tools of the ECB

The OCA evidence suggests that EA might not be an OCA, but the monetary authority of the EA, the ECB, still needs to set a single monetary policy for all EA countries at the risk of causing structural imbalances. Monetary policy decisions are rather complex in practise. A substantial empirical and theoretical literature has established that agreeing on a nominal target enhances the effectiveness of monetary policy, because it provides an anchor for the expectations of the public and thus reduces uncertainty regarding the monetary policy conduct (Mishkin, 2011). Since the 1990s many central banks have chosen the inflation rate as their main target. The dominance of the inflation target is partially due to historical issues with other targeting regimes, such as exchange rate targeting, and advances in monetary policy theory that suggest that a stable inflation rate has important benefits for macroeconomic stability (Bernanke & Mishkin, 1997; Taylor, 1995).

According to the Treaty on the Functioning of the European Union, Article 127 (1) *[T]he primary objective of the European System of Central Banks (hereinafter referred to as "the ESCB")⁵ 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 with a view to contributing to the achievement of the objectives of the Union as laid down in Article 3 of the Treaty on European Union.*"

(Eurostep & EEPA, 2014) Specifically, since 2003 the Governing Council of the ECB has set the inflation target below, but close to 2% over the medium-term (ECB, 2014c). As demonstrated throughout this thesis, this average target can imply rather different inflation rates in the individual

5 The ESCB consists of the ECB and all National Central Banks of the EU member countries.

countries.

To achieve this goal the ECB pursues a two-pillar strategy: It uses its control over short-term nominal interest rates – mostly the rates on its standing facilities and main refinancing operations - to stabilise prices in the medium-term in response to shocks. In addition, it is monitoring money to ensure that the short- and mid-term policies do not deviate too much from the long-term relationship between money and inflation outlined by the quantity theory of money. According to this theory, money should grow at a similar rate as real output given that money growth determines inflation in the long-run. The ECB has therefore adopted a reference value for the growth of broad money (M3) and includes credit market indicators into its analysis (Issing, 2008). In setting monetary policy the ECB relies on a variety of indicators and forecasts generated from large structural and statistical models. In combination with expert knowledge this information serves as a basis for the decision of the ECB's Governing Council (Issing, 2008). The interested reader can consult ECB (2001) for a more detailed description of this process.

Clearly, the decision making process of the ECB is rather complex. Nonetheless many research questions and empirical assessments require a measure of whether monetary policy was loose or tight over a certain period. The conventional approach to this question is to estimate a monetary policy rule, which approximates the policy decisions of the CB and compare it with a policy rule that has empirical and theoretical appeal. The most prominent policy rule is the Taylor rule, first described by Taylor (1993):

$$i = r + \pi + 0,5 * (\pi - \pi_t) + 0,5 * y_{gap}$$

where i is the policy rate, r is the real rate of interest, π is the inflation rate, π_t is the target rate of inflation and y_{gap} is the output gap, meaning the deviation of output from its steady-state value. It is rather popular, because it has been shown to be a good approximation of the U.S. FED's policy conduct in the 80s and 90s and because it yields good empirical results when used in modern macroeconomic models employed by central banks for their policy forecasts. According to the Taylor rule the monetary authority sets the short-term interest rate in response to deviations of inflation from the target and the output gap (difference between output and the steady state level of

output). The idea that the coefficient of the inflation gap has to be larger than unity to achieve price stability has become known as the “Taylor principle”. It implies that nominal interest rates need to rise more than the rise in inflation, meaning that the real interest rate needs to rise (Mishkin, 2011). This increased emphasis on changes in inflation is considered an important improvement in monetary policy since the 1970s. Authors like Clarida et al. (1998) have shown that before the 1980s policy makers did not follow the Taylor principle and have concluded that this contributed to the “Great Inflation” observed in the 1960s and 70s. Post-1980, researchers find that a shift in monetary policy towards the Taylor principle has coincided with a prolonged period of low inflation and output variability. This period of “Great Moderation” has therefore often been partially attributed to improvements in monetary policy conduct – even though there is a large literature which discusses alternative or complementary explanations for the calm macroeconomic environment since the 1980s (Bernanke, 2004; Mishkin, 2011; Taylor, 2007).

It should be noted, that using the Taylor rule as a benchmark has a number of shortcomings: Firstly, it is controversial whether the coefficients chosen in the original rule are appropriate. Particularly the coefficient of output is very controversial and the rule is sensitive to the measurements of inflation and the output gap. More importantly, the Taylor rule includes contemporaneous values of inflation and output. This is problematic, on the one hand because CBs take into account future values of these variables as well, given that monetary policy is effective with a lag and secondly, because contemporaneous values for macroeconomic variables are often not known when the policy is set (Bernanke, 2010). Moreover, during the financial crisis the transmission of the policy rate to market rates was interrupted and the consequences of monetary actions therefore shifted compared to “normal” times. In the post-crisis environment the EU and ECB have pursued a number of macro-prudential reforms to change the incentive structures for economic agents, in particular financial intermediaries, and to create a centralised supervision mechanism. In November 2014, for instance, the single supervisory mechanism will be launched, which will put 128 banks under the supervision of the same regulatory authority (ECB, 2013). These reforms are considered necessary to prevent another financial crisis (Borio & Zhu, 2012; Diamond & Rajan, 2012; Rajan, 2005). Institutional changes will affect the behaviour of financial intermediaries, which is most likely creating an interaction with the incentives created by monetary policy. It is doubtful whether a Taylor rule assessment is very reliable in times of financial turmoil or institutional changes.

3.4 Using the Taylor Rule to Evaluate Monetary Policy

Given the good empirical results and theoretical support for the stabilising properties of the Taylor rule, it has often been used as a benchmark to assess whether monetary policy was too expansionary, meaning that interest rates were below the target rates or too restrictive, meaning that they were above the target rate. In the former case, monetary policy can lead to unsustainable booms and economic expansions, while in the latter case it can contribute to low investment and growth. These channels are discussed in more detail in chapter 4. A substantial amount of publications has used the Taylor rule to assess the monetary policy stance before the financial crisis in Europe and the U.S. (Ahrend et al., 2008; Hannoun, 2012; Taylor, 2007). Nechio (2011), for example separates the EA countries into core and periphery countries when comparing the actual interest rate trajectory with a modified Taylor type-rule of the form

$$i = 1 + 1.5 * \pi - u_{gap}$$

where i stands for the short-term policy rate, π for the inflation rate and u_{gap} for the deviation of unemployment from its long-run level. The study finds marked differences between the required policy rates for periphery and core countries. Between 2001 and 2007 a Taylor-type rule for the periphery required an approximately 4 percentage points higher interest rate than the same rule for the core countries. A comparison with an estimated ECB rule shows that the ECB's policy rate was very close to the Taylor-rate for the core countries, which implies that interest rates were much too low for the periphery countries (Nechio, 2011). Johansson & Ljungberg (2013) compare the policy rule with the original Taylor rule (Taylor, 1993) and estimate the coefficients of a rule that is qualitatively similar to the original rule by fitting in EA data:

$$i = \alpha + \beta_1 * (\pi - \pi_t) + \beta_2 * y_{gap} + \epsilon$$

where π_t is the target rate of inflation set by the ECB and y_{gap} is the output gap. They find that the weight on the output gap is larger than the weight on the inflation gap, which in turn is much lower than the coefficient prescribed by the standard Taylor rule. Similar to Nechio (2011) they suggest that this may partially be due to the fact that inflation was a periphery problem and the negative output gap a core, and most notably a German problem. In addition, the paper shows that

even when using the estimated ECB rule, the rule would have prescribed higher interest rates, most notably in Ireland and Spain, if it was based only on the individual countries. Johansson & Ljungberg (2013) use the currency union mechanisms outlined in section 3.1. to discuss how the fact that judging by a Taylor rule, monetary policy was highly expansionary for the periphery countries has contributed to the very different macroeconomic developments in the core and periphery countries.

Figures 2 and 3 extend the analysis of Johansson & Ljungberg (2013) for more recent time periods. The first graph depicts a comparison of the target rates prescribed by the original Taylor rule, where the policy rate is approximated for simplicity by the EONIA⁶, r is set to 2% (see Johansson & Ljungberg, 2013), π is the annualised inflation rate measured with the CPI, π_t is the target rate of inflation set by the ECB, which is currently below, but close to 2 and was 1,5 until the second quarter of 2003, and y_{gap} is the output gap published by the OECD. Figure 2 shows that for most of the period analysed the EONIA has been below the predicted Taylor rate for Germany, Spain and the EA. It has most closely fitted Germany and shows the most marked difference to the required rate for Spain, with interest differentials as large as 4 percentage points. Given that the transmission of the policy rate to other interest rates and thus the real economy has been disrupted during the crisis, the Taylor rule is most likely not a good guideline for the time between 2008 and 2012. It can be assumed that since 2012/2013 the transmission mechanism has started to revert to its normal functioning (see chapter 4.1). If this is the case, then the Taylor rate comparison could provide some guidance as to whether monetary rates are too low or too high in the EA. Surprisingly the data suggests that in 2013 the interest rate was too low for all regions, but particularly for Germany. The issues about the Taylor rule in section 3.3. should be kept in mind, when using these results. In fact, the interaction of monetary policy with regulatory changes is an issue that should be investigated further in the post-crisis context, but is beyond the scope of this thesis.

⁶ The EONIA is not a policy rate, but as shown in Figure 10, apart from the immediate crisis period, when an assessment with the Taylor Rule is highly dubious due to the problems of monetary transmission, it has been following the rate on the ECB's main refinancing operations close enough to be used of this purpose. The benefit is that it changes more smoothly than the actual refinancing rate and data is more readily available for different periods.

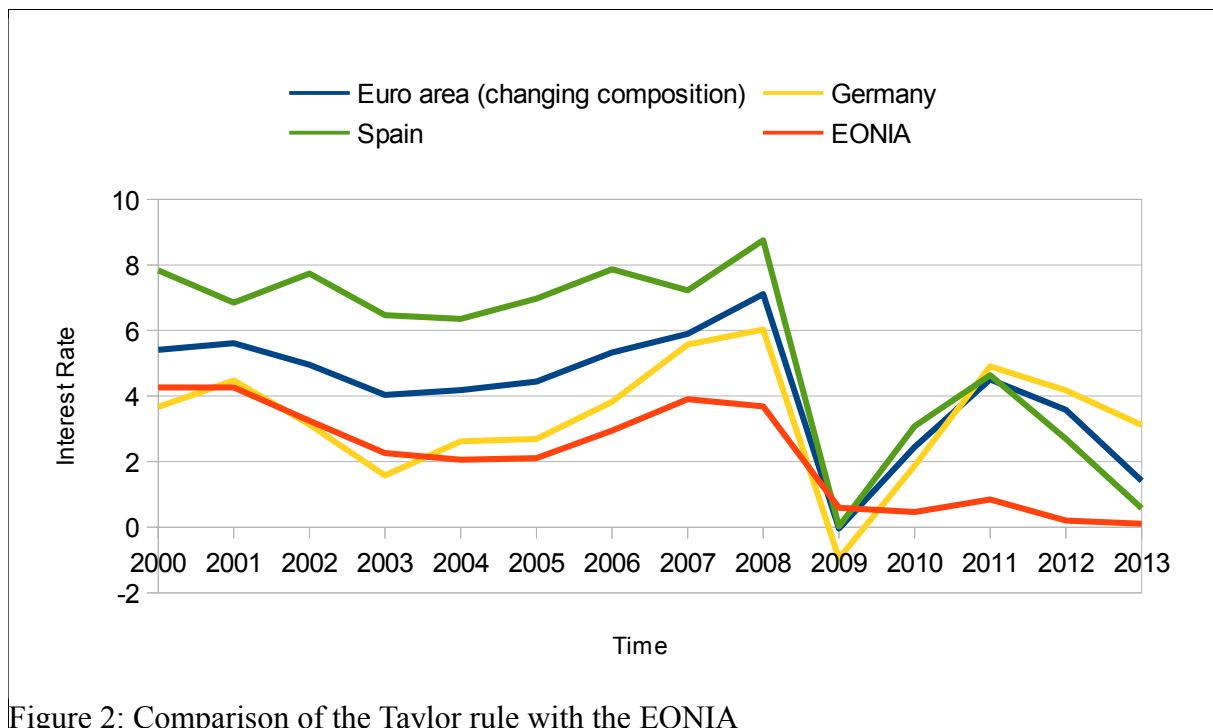


Figure 2: Comparison of the Taylor rule with the EONIA

Figure 3 shows the results of fitting German, Spanish and EA data into a Taylor-type policy rule estimated from EA data by Johansson & Ljungberg (2013). The rule has the form

$$i = 2,83 + 0,73 y_{gap} + 0,31(\pi - \pi_t)$$

which suggests that it gives a rather low weight to inflation and does not fulfil the Taylor principle. Johansson & Ljungberg (2013) use quarterly data and show that the rule fits the ECB's policy rate rather well. The difference between the EA rule and the EONIA in Figure 3 are most likely due to the fact that the data used in this thesis are annual data and thus less accurate. The results are, however, qualitatively very similar. The comparison shows that using this rule, the policy rate was too restrictive for Germany and too loose for Spain before the crisis and vice versa after the crisis. In fact, the rule suggests that the ECB's dilemma stemming from the monetary union is now reverting itself, with interest rates not being low enough for the periphery and too high for the core.

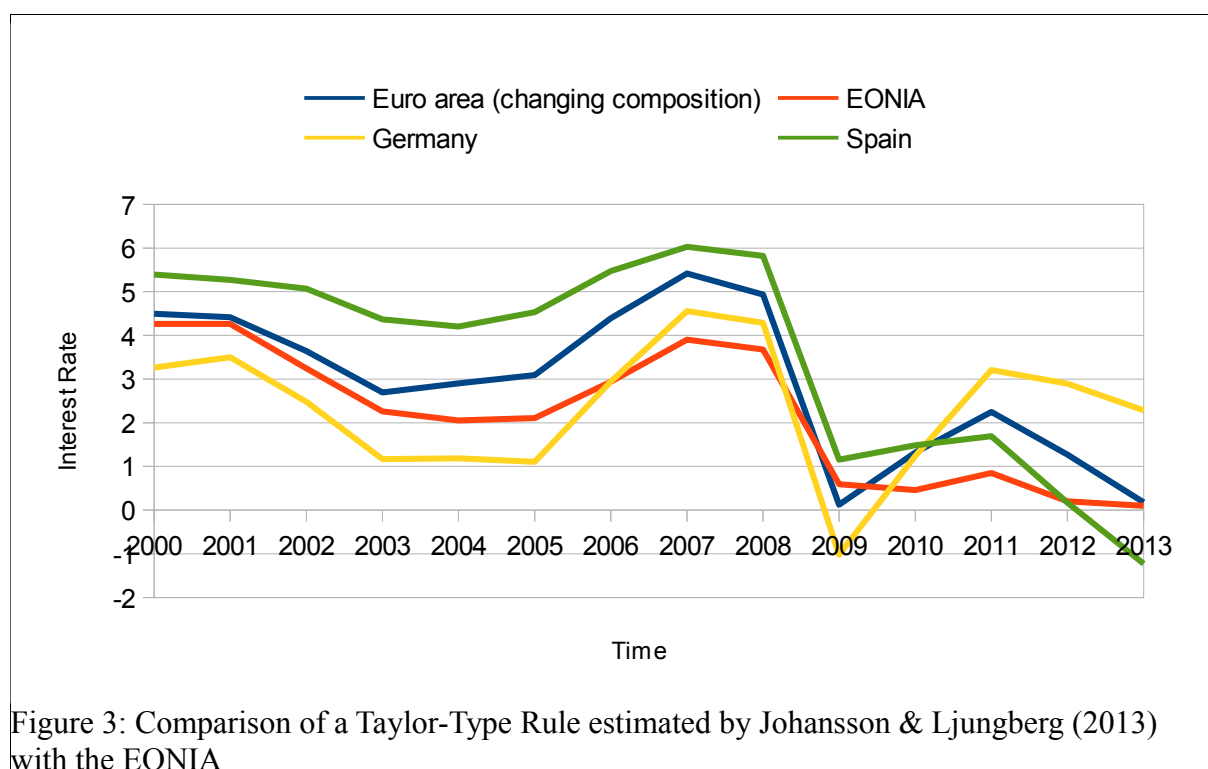
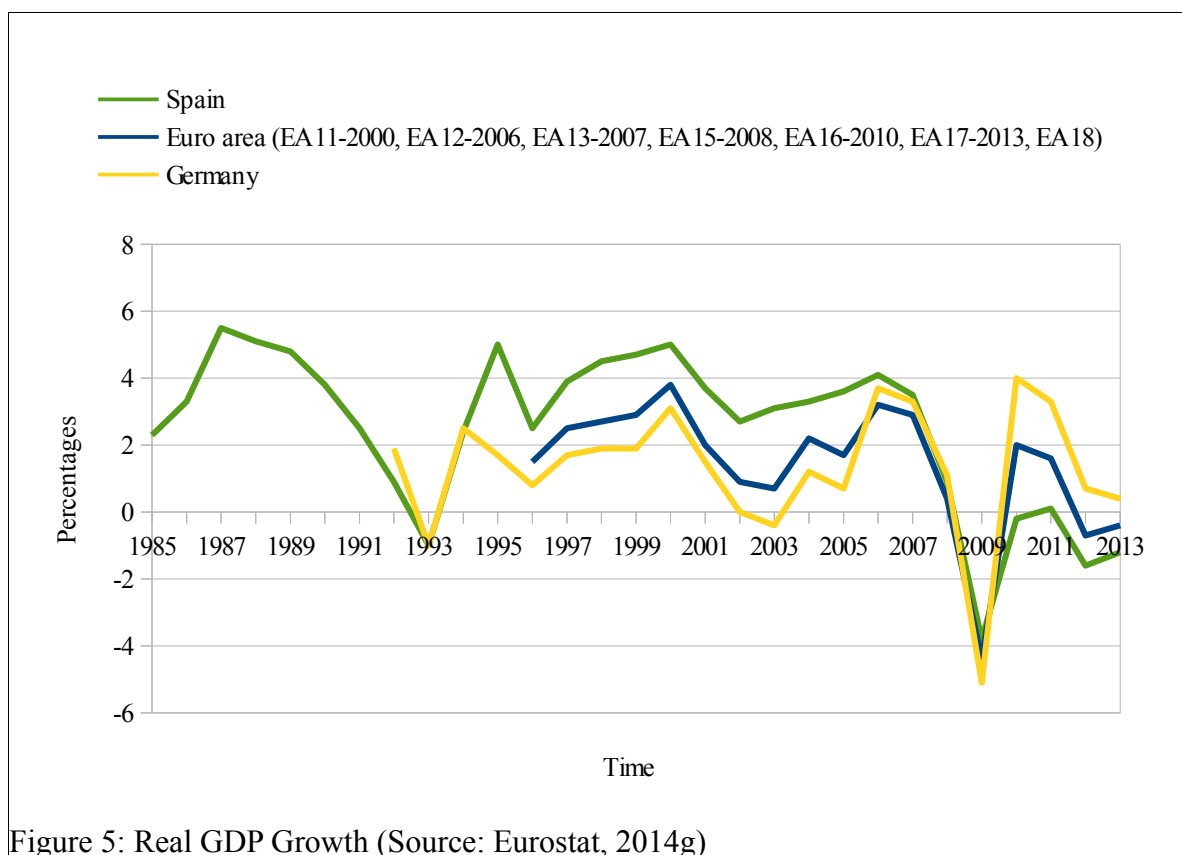
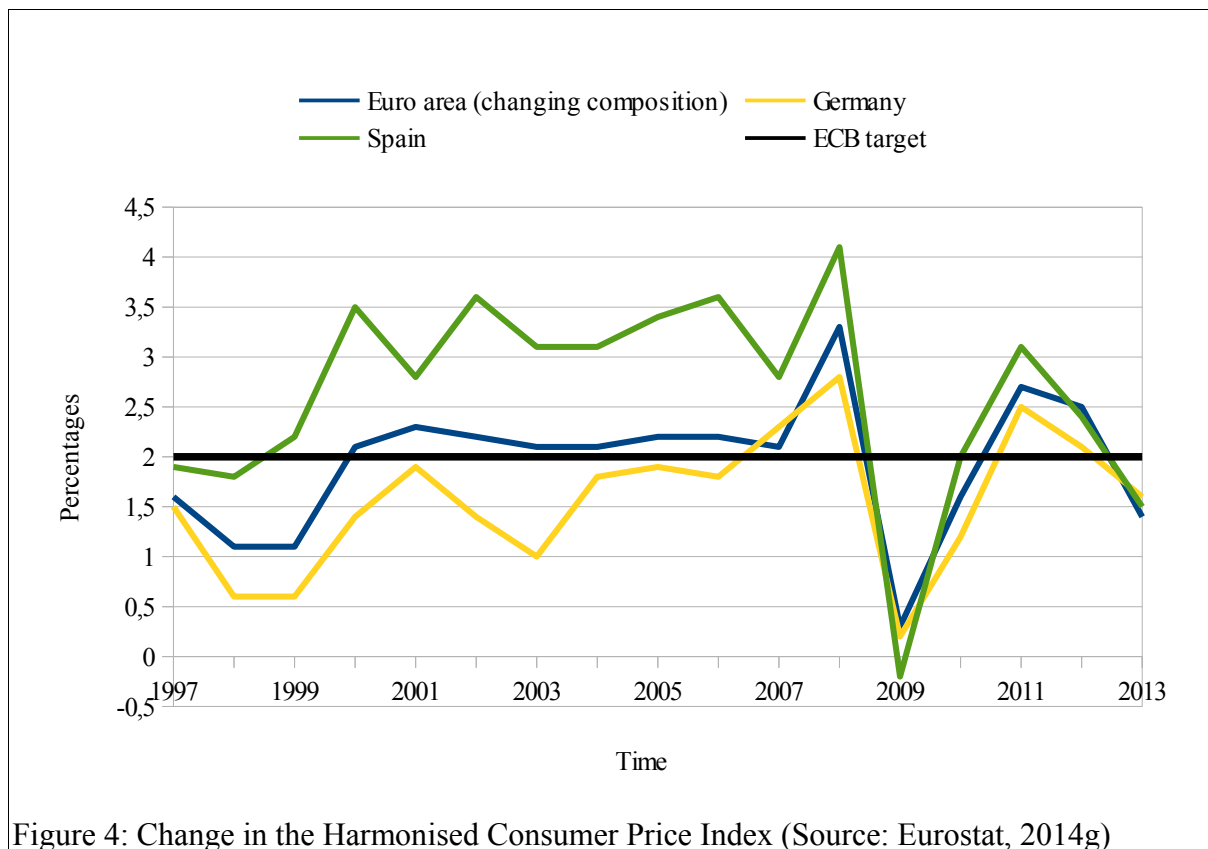


Figure 3: Comparison of a Taylor-Type Rule estimated by Johansson & Ljungberg (2013) with the EONIA

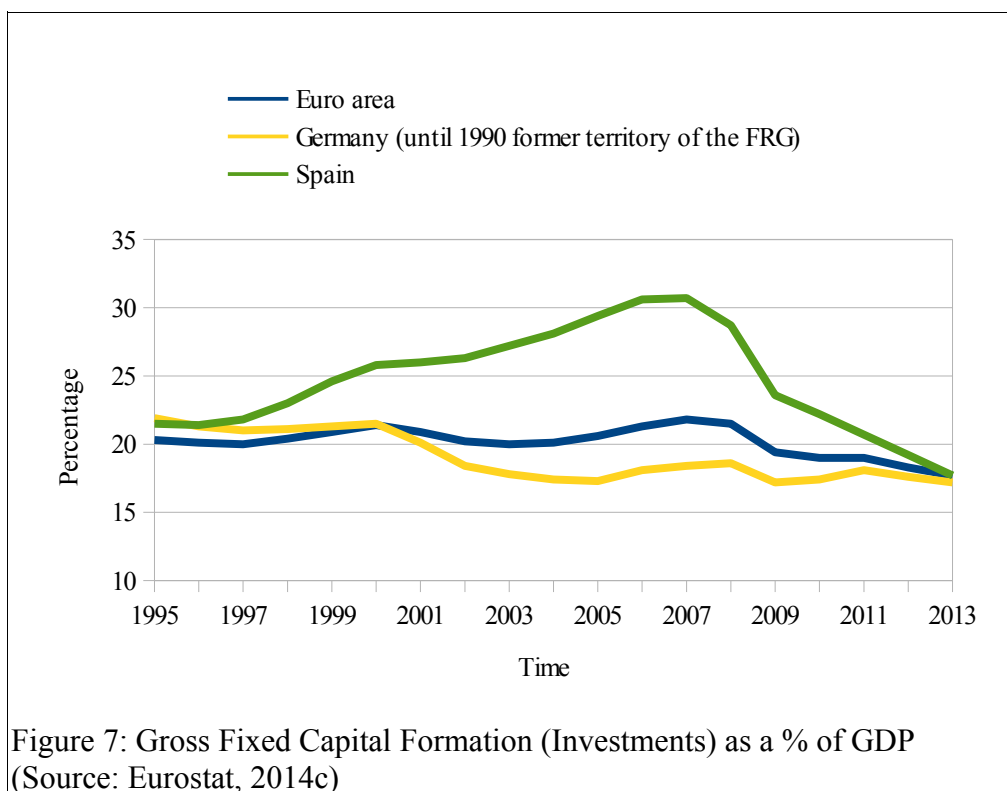
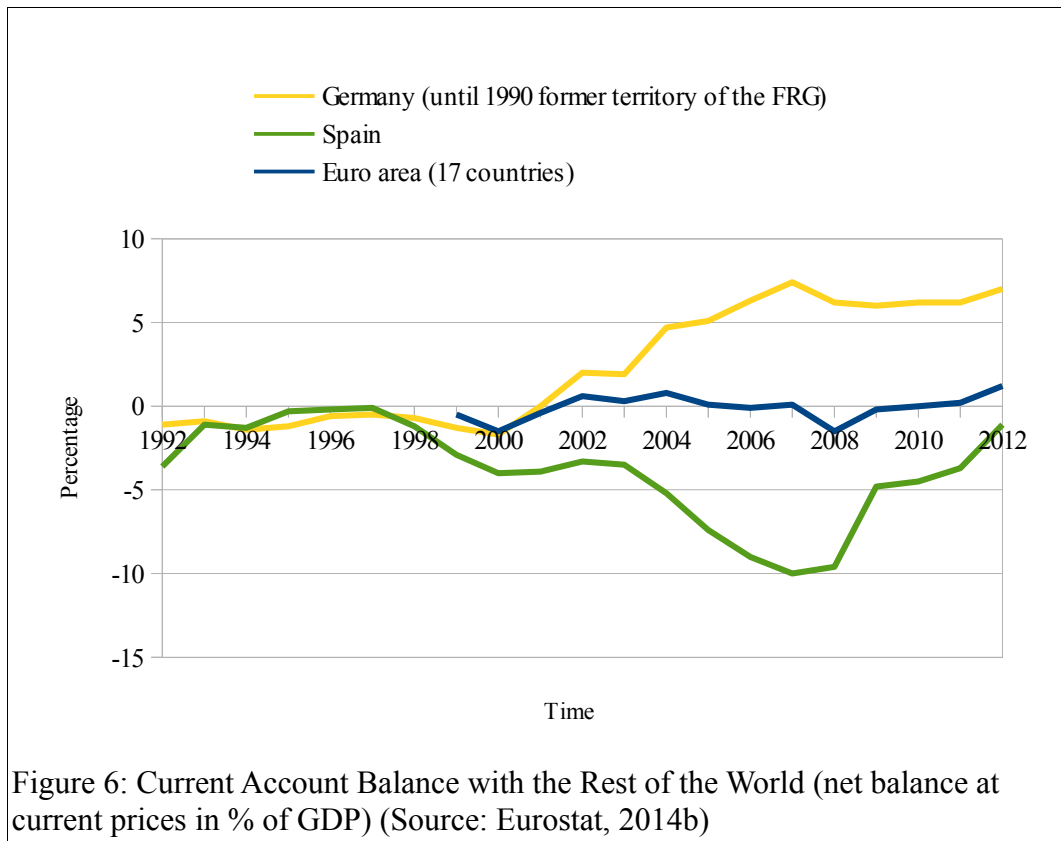
3.5 Macroeconomic Development and Monetary Policy: Spain, Germany and the EA

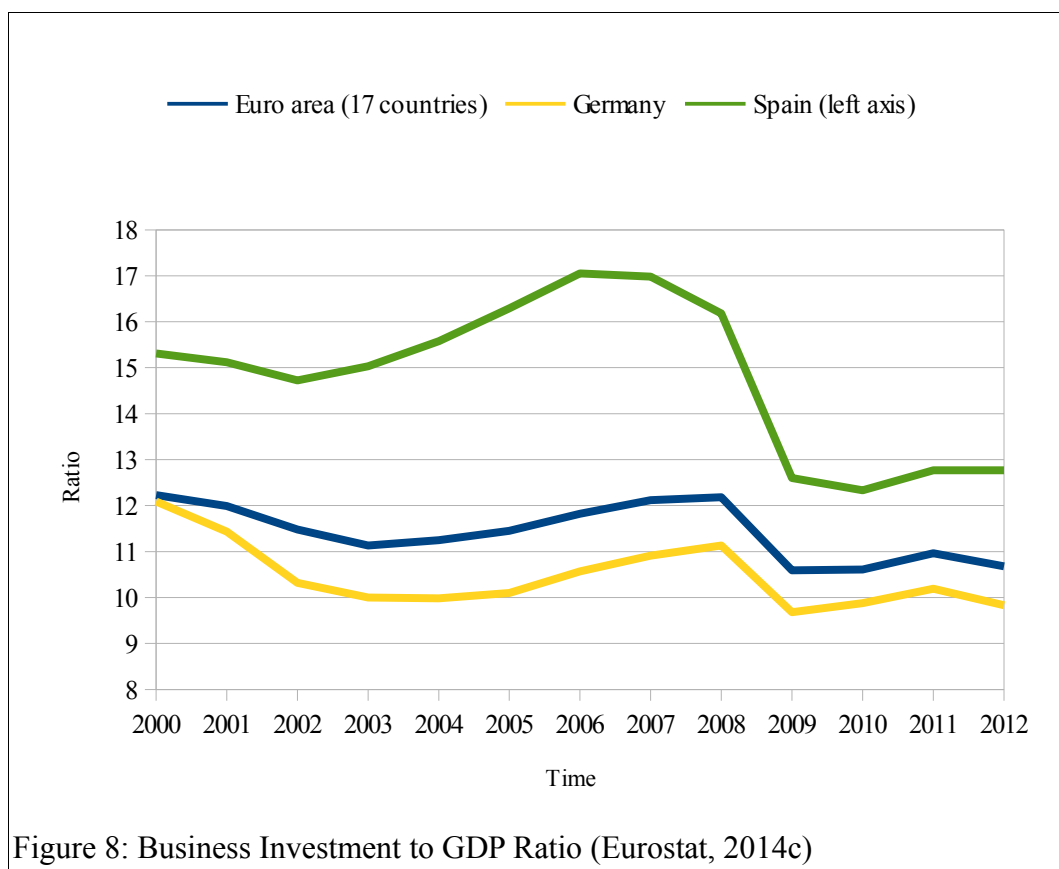
The Taylor rule estimation has provided some guideline of how expansionary or restrictive monetary policy was for these countries. It is therefore interesting to see if the macroeconomic developments in Spain, the EA and Germany are in line with these findings. This can provide further empirical evidence regarding the impacts of the EMU and the common monetary policy on the imbalances in Europe. Figures 4 - 7 show the macroeconomic indicators in Germany, Spain and the EA. They emphasise the substantial differences between two of the largest EA member states and subsequently one of the dilemmas the ECB is facing in choosing the appropriate monetary policy. While the EA inflation rate is very close to the ECB's 2% target, the Spanish rate lies substantially above and the German rate below for most of the pre-crisis period (Figure 4). These differences are clearly consistent with the Taylor rule estimation, but need to be understood in the light of the broader macroeconomic context as well.



German growth was below the EA average throughout the pre-crisis period. In particular, at the end of the 1990s the German economy was in a bad state with high unemployment, low growth and structural problems. One particular problem were high labour costs, which incentivised firms to shift their production to Eastern Europe (The Economist, 2013a). The “Agenda 2010” implemented in 2002/2003 is now widely seen as one of the main reasons why the German economy turned around. It was a reform program, which relied on major structural changes aimed at increasing the flexibility of the labour market and reducing costs, accompanied by severe cuts to the welfare state (Zhong, 2012). The reforms were praised and criticised at the same time, but they were effective in restoring the competitiveness of the German economy. In addition to the reform, the rise of emerging markets like China created large demands for German exports, as German companies are world leaders in chemicals, machinery and cars. This has led to a comparatively large current account surplus (Figure 6)(The Economist, 2013a). As the GDP figures show, German growth rates started improving around 2003/2004 and business investments have started to rise again. It is interesting to note that these changes are roughly consistent with the time when the EONIA fell below the target predicted by the Taylor rate. Despite the gradual fall in long-term interest rates evidenced by Figure 1 investments as a percentage of GDP have been stagnating for most of the period analysed.

For Spain, the case has been almost reversed. In the post-Franco era Spain had above average growth rates during the 1990s while transitioning towards democracy (The Economist, 2004). Despite its high growth rates, high wage rigidities, rising labour costs and a lack of investment in education and R&D were reported to lead to low productivity growth before the crisis (OECD, 2005). Moreover, Spain has had a widening current account deficit, due to a lack of export orientation and increasing consumer wealth (The Economist, 2004). These macroeconomic tendencies were partially associated with the implementation process of the EMU, after which the term premium (gap between the market and artificial rate) decreased markedly. This suggests that the devaluation risk of Spain was high previous to entering the monetary union and lowered through the common currency (Boivin et al., 2008). Figure 1 illustrates the fall of the long-term interest rate on Spanish debt securities. It is interesting to note that the drop in long-term interest rate coincides with the strong rise in investments shown by Figures 7 and 8. The monetary union made it easier for Spain to finance a strong expansion, which turned out to be unsustainable. Again, the evidence is extremely consistent with the Taylor rule graph presented in the previous section.





According to the latest OECD Forecast for the EA from May 2014 expected GDP growth in 2014 is 1,2% compared with 2,2% for the whole EA and in 2015 1,7% compared with 2,8%. It also predicts a mild rise in inflation for 2015 (OECD, 2014). There are marked differences between the periphery and the core countries. Despite the fact that Germany is facing a number of issues such as stagnating wages and falling public and private investment ratios, it is currently one of the fastest growing European countries with one of the lowest unemployment rates (The Economist, 2013a). Headline inflation forecasts suggest that inflation in Germany and other core countries will rise from around 1% in 2014 to 2% in 2015 (OECD, 2014). Spain has been hit much worse during the crisis and still has record unemployment rates, inflation rates close to 0% and subdued GDP growth rates. Opinions regarding the future prospects of Spain are mixed (Chislett, 2012; Johnson, 2012). As Figure 6 shows, the Spanish current account deficit has been declining, as Spanish businesses have started to orientate themselves towards foreign countries due to a lack of domestic demand (Johnson, 2012). In addition, the labour reform of 2012 has led to falling labour costs and more job creation, increasing competitiveness of Spanish goods (OECD, 2013). OECD forecasts predict a

steep increase in Spanish growth rates and slight increases in its inflation rate for 2014 and 2015 (OECD, 2014). However, economic recovery until recently has been slow, due to the large amounts of corporate debt, non-performing loans and the need for restructuring (Buck, 2014). Chapter 4 discusses extensively what these macroeconomic developments imply for the current monetary policy choice of the ECB.

4 The Trade-offs of Monetary Policy in a Heterogeneous Currency Union

The previous chapter has demonstrated that the critics of the EMU have a lot of theoretical and empirical support for their claims. Nonetheless, on the EU level there is not much political support for the idea of abandoning the currency union that took years to build and improve and that many still see as a force of economic integration. The commitment to save the currency union is reflected in Mario Draghi's statement of July 2012 that "within our mandate, the ECB is ready to do whatever it takes to preserve the Euro" (Wolf, 2014). Given that the abandonment of the Euro is an unpopular idea among the politicians that have spent the past six years trying to save it, one question suggests itself: if there is no one-size-fits-all policy for the EA, but dissolving the EMU is infeasible, what kind of trade-offs is the ECB looking at when setting its policy? In other words, even if having no EMU was the first-best solution, what would be the second best? In any given situation the ECB has three options: it can do nothing or it can either pursue expansionary or restrictive monetary policies. Recently the sluggish recovery has increased the pressure on the ECB to further ease its monetary policy stance (Jones, 2014). In June 2014 the ECB lowered the interest rates on the Main Refinancing Operations and the deposit facilities from 0.25 to 0.15 and 0.00 to -0.10 percent, respectively. In a recent update on monetary policy Mario Draghi (2014) explained the monetary policy stance:

"We will maintain a high degree of monetary accommodation and act swiftly, if required, with further monetary policy easing. We firmly reiterate that we continue to expect the key ECB interest rates to remain at present or lower levels for an extended period of time. This expectation is based on an overall subdued outlook for inflation extending into the medium term, given the broad-based weakness of the economy, the high degree of in-utilised capacity, and subdued money and credit creation."

This statement indicates that the ECB is planning on keeping interest rates close to the zero-lower bound for a prolonged period of time and potentially undertake further expansionary policies. This chapter considers the three choices the ECB has in the current situation and the risks associated with them. It attempts to evaluate the current policy stance and highlight how the heterogeneity of the EMU contributes to the creation of a dilemma for the ECB.

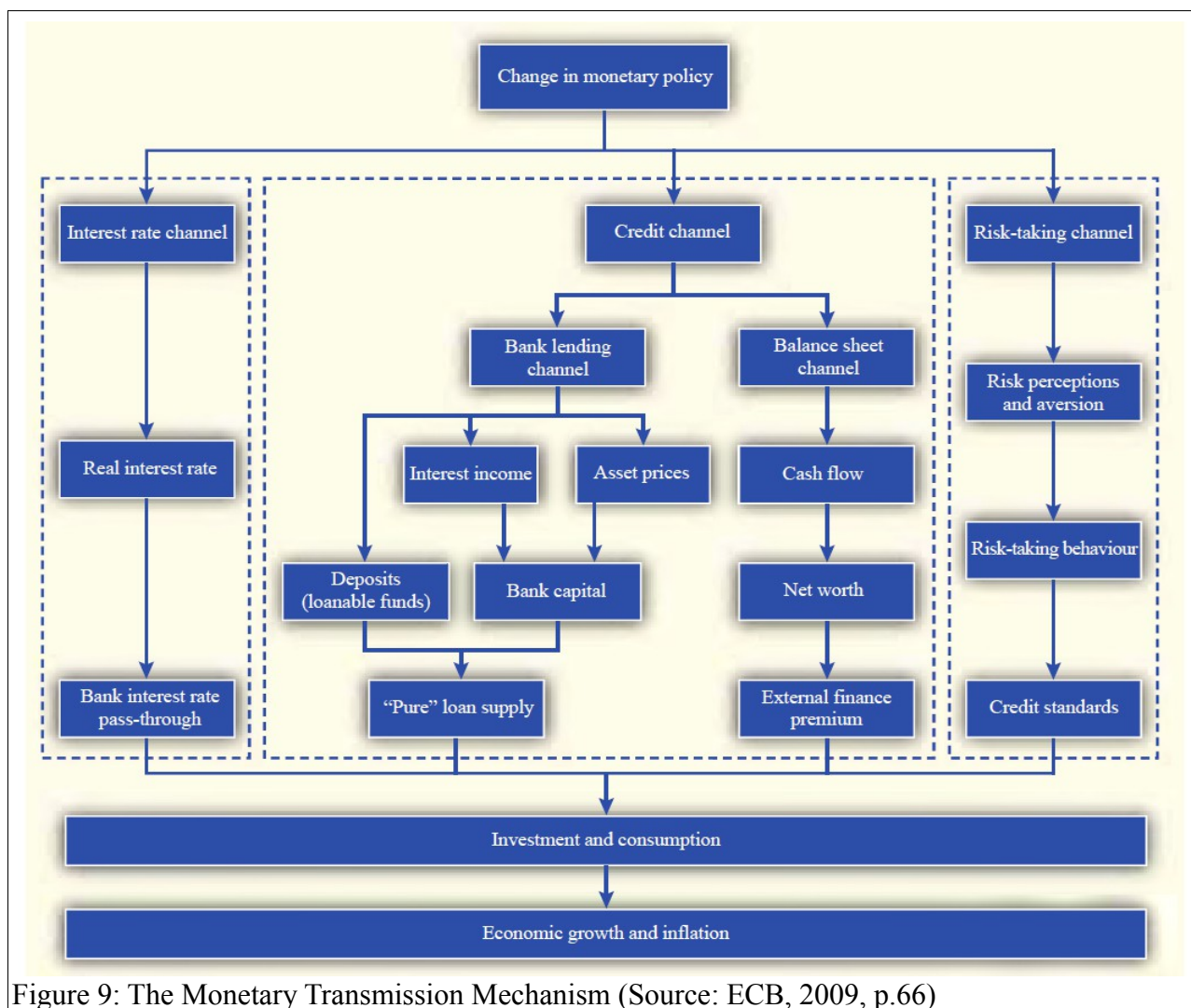


Figure 9: The Monetary Transmission Mechanism (Source: ECB, 2009, p.66)

The discussion in this section relies strongly on the monetary transmission mechanism (MTM), a key piece in monetary theory: It describes how a change in monetary conditions is propagated through the economy and affects real economic variables like output and employment. Its contemporary version consists of a variety of channels: the interest-rate, credit, risk-taking, exchange rate and equity channels of monetary transmission. Due to limitations of scope this

section focuses on the former three channels as illustrated in Figure 9. In addition, it puts some emphasis on other aspects of monetary policy related to the risk of financial instability after the crisis.

4.1 The risks associated with raising interest rates

4.1.1 The Interest Rate Channel

Theory

There are two main reasons against raising interest rates in the current environment: one of them is related to the idea that rising interest rates have a negative effect on consumption, investment and output in the short-run. The channel describing the inter-temporal substitution and wealth effects on investment and consumption expenditure in response to a change in monetary policy is referred to as the interest-rate channel of monetary transmission (Borio & Zhu, 2012). It is one of the theoretically and empirically best established channels of the MTM. The simplest textbook analysis of the interest rate channel is within the context of a traditional Keynesian IS-LM model. Here, a monetary expansion leads to a fall in the real interest rate, which then triggers an increase in investment - including consumer durable expenditure - and subsequently in output (Mishkin, 1996). This model has been enriched in a variety of ways, for example, by introducing a differentiation between nominal and real variables and giving expectations a prominent role (Meltzer, 1995). New Keynesian economics has developed the framework to include price and wage rigidities. In this, more realistic, description of the economy the reason for short-term effects of monetary expansion on the real economy is that prices and wages adjust only gradually. Therefore a monetary expansion is not immediately passed through to inflation, but a fall in nominal rates leads to a temporary fall in the real interest rate and therefore a change in investment and consumption and vice versa (Mishkin, 1996). A complete monetary framework takes into account that these changes in the real variables can then be the cause for a further reaction of the monetary authority. Absent another reaction of the monetary authority, the real rate returns gradually to its long-run value. The effect of monetary policy on real variables via the interest-rate channel is therefore a short-term effect (Taylor, 1995).

Empirical Analysis

There are several aspects of the interest channel that are noteworthy: firstly, during the crisis the

monetary transmission mechanism was strongly impaired due to uncertainty and financial imbalances. A large part of the transmission of monetary rates to market rates relies on the transmission via the banking system: During normal times the EONIA is fairly close to the rate set by the ECB on its Main Refinancing Operations (MRO). As Figure 10 illustrates, only between the end of 2008 and mid-2013 did the relationship between the EONIA and the MRO rate not hold. Instead, there was a differential between the two, which shows that the ECB temporarily the tight control it normally has over other short-term rates in the economy. It is reasonable to assume that these distortions have also affected other interest rates in the economy and have so impaired the interest rate transmission of monetary policy.

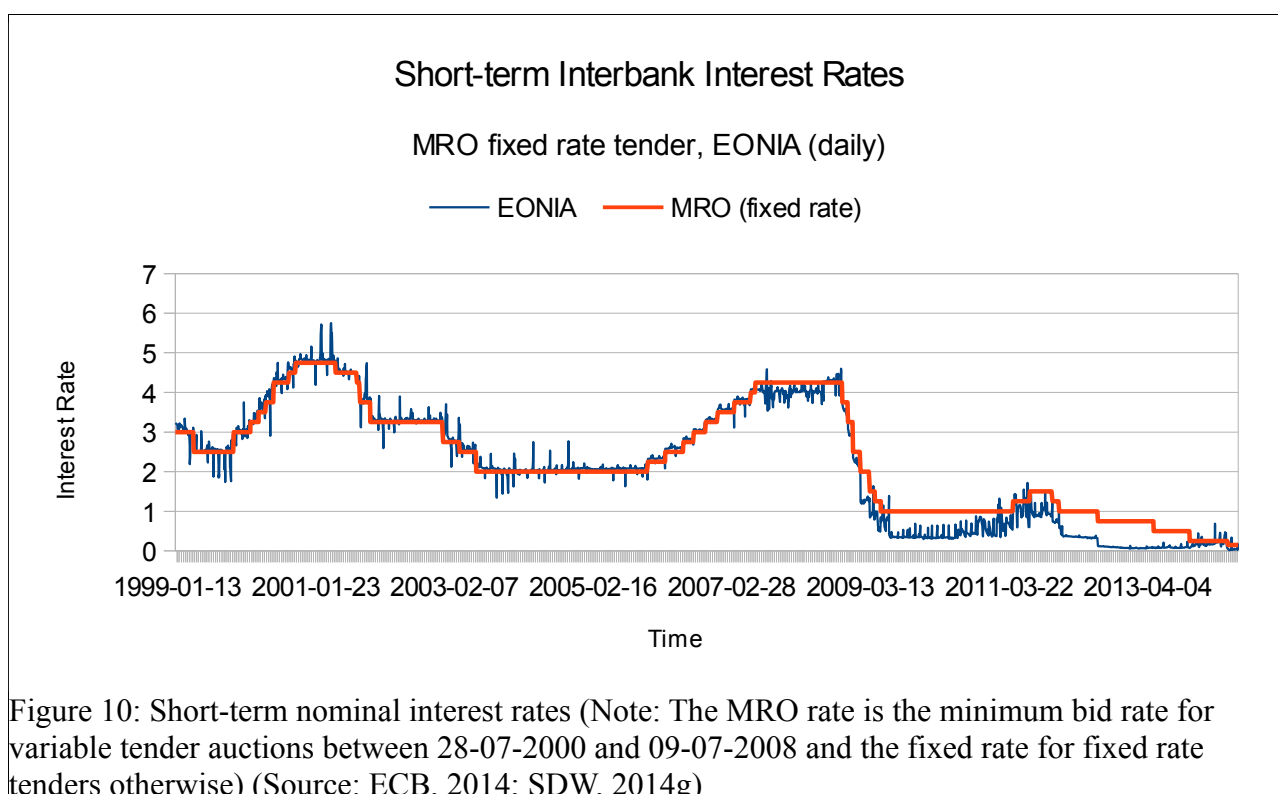
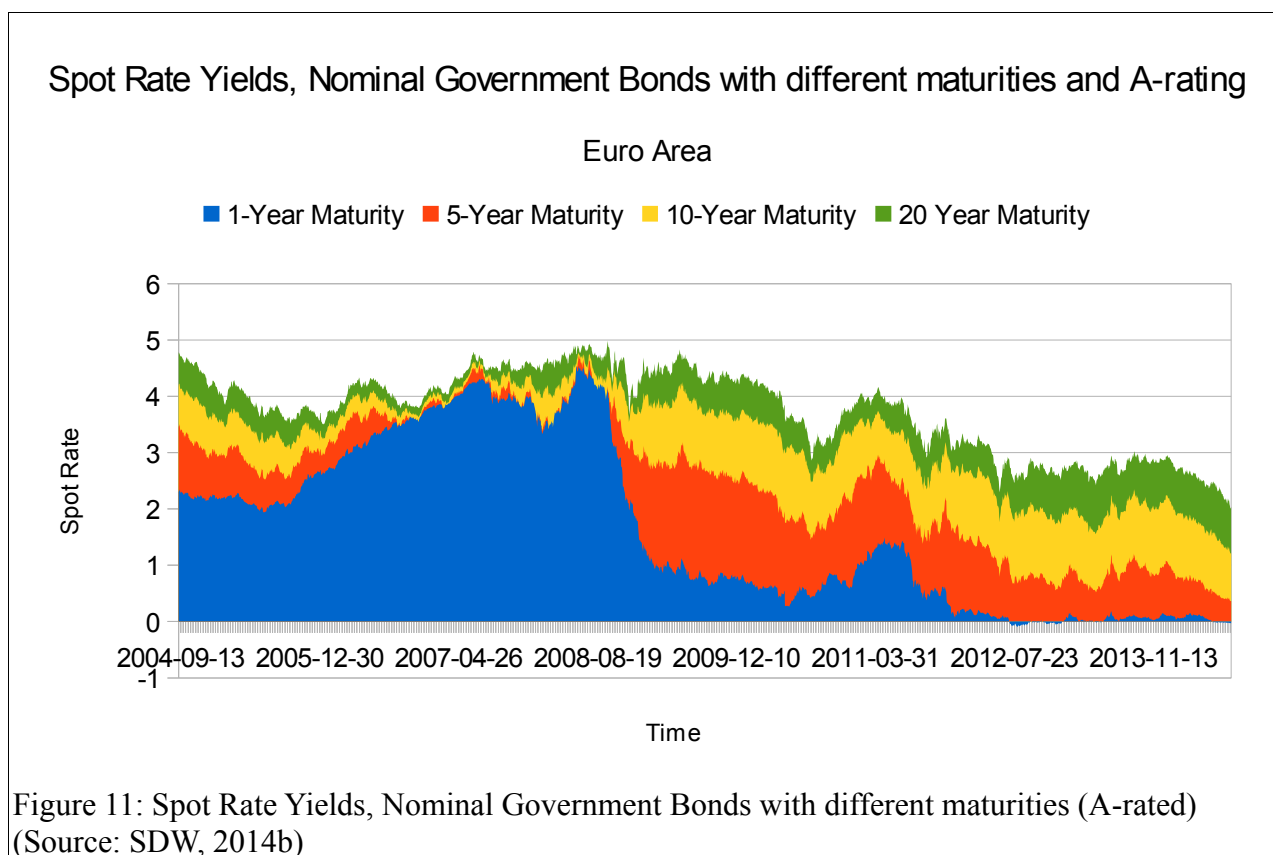


Figure 10: Short-term nominal interest rates (Note: The MRO rate is the minimum bid rate for variable tender auctions between 28-07-2000 and 09-07-2008 and the fixed rate for fixed rate tenders otherwise) (Source: ECB, 2014; SDW, 2014g)

Another noteworthy point is that the important interest rates for the pass-through of monetary policy to real variables are the real rates and in particular long-run real interest rates. Given that CBs control the nominal short-term rate it is important to understand the links between nominal and real as well as short and long-term rates. The former depends on the degree of real rigidities and various institutional factors and its estimation is subject to some controversy – but, as pointed out above, a fall in nominal rates should generally lead to a fall in real rates due to the fact that prices and wages

are sticky in the short-run. The latter relationship between short-term rates and long-term rates is theoretically described by the expectations hypothesis of the term structure. According to this theory a rise in short-term real rates translates to a rise in long-term real rates as these rates are a weighted average of expected future short-term rates. This implies that rises in the long-term rate are lower than those of the short-term rate if market participants expect the change of short-term rates to be temporary and larger if they expect further increases in the short-term rate (Taylor, 1995). This implies that, theoretically, the interest rate channel can operate when the short-term nominal interest rate is zero, as expansionary monetary policy increases inflation expectations and brings down long-term rates. This effect can be supported by forward guidance by the CB, which can signal that it will keep short-term interest rates low for a prolonged period of time (Mishkin, 1996; Taylor, 1995). Figure 1 shows development of the rate on 10-year government bonds in Spain and Germany and illustrates a marked fall in these rates in Germany and more recently also in Spain. The interest rate channel predicts a positive effect of this rise on investment and consumption. Figure 11 shows some evidence for the effectiveness of monetary policy on lowering the long-term rates in the EA. It depicts the development of the yield curve spot rates of A-rated government bonds in the EA with different maturities from 1 year to 20 years. The graph clearly shows the pronounced drop in 1-year yield in response to the monetary policy undertaken by the ECB. Shortly before and during the crisis, the yield curve was rather flat, with very small term-spreads, but has steepened considerably as long-term rates have not fallen as much as more short-term rates. Nonetheless the graphs show that over time the more long-term rates have started to fall as well. The fall in long-term rates is most likely due to the forward guidance efforts of the ECB to raise inflation expectations via keeping interest rates low. Given that monetary policy seems to have been effective in lowering long-term rates, it is very likely that raising short-term rates would have the opposite effect, thus weakening an already fragile economic recovery.



This analysis has to be taken with some caution though. First of all, a number of scholars have argued that empirical studies find contradicting results regarding the magnitude of the interest-rate channel in practise (e.g. Hubbard, 1995). Empirical studies are complicated by the fact that due to institutional arrangements the MTM is slightly different in all countries. Angeloni et al. (2002) report, for example that in Germany interest-sensitive components like investment and consumption play a minor role for explaining the shifts in output in response to a monetary policy shock. In Spain, on the other hand, there is evidence of an almost pure interest rate transmission through a decline in investment (Angeloni et al., 2002). Furthermore, Figure 11 shows that the term spread between short-run and long-run rates on government bonds has varied considerably over the past ten years. Long-run rates remained largely unaffected by the rise in the short-term rate before the crisis. In fact, they also show a rather sluggish adjustment after the crisis. Adrian et al. (2010) report similar findings for the U.S.: between 2004 and 2006, for example, the FED raised short-term interest rates, but the long-term rate remained largely unaffected leading to a fall in the term spread. The evidence suggests that in recent periods neither the FED nor the ECB had much control over the long-term rates. This calls into question the idea that CBs have control over the relationship

between short-term interest rates, long-term interest rates and economic activity. Moreover, a number of studies have highlighted that the focus on long-run rates could actually be misleading and have looked in more detail on the effects of the term structure on the economy (see section 4.2.1)

This section has shown that long-term rates have been gradually falling in Germany, but started a steeper decline only recently in Spain. This means that the effects of low long-term rates on investment and consumption in the periphery could start to manifest themselves in a more pronounced way in the near future. Raising interest rates could be highly counterproductive in such an environment. It is, however, notable that the decline of long-term rates on Spanish government debt coincides with the commitment made by the ECB in 2012 to do whatever it takes to save the Euro. Since this statement and the subsequent policy actions, long-term rates between Germany and Spain have started to converge again – more accurately, Spanish rates have started to decrease to the extremely low German levels. Given the differences in the macroeconomic outlook and stability of both economies it is questionable whether this convergence is in fact reasonable. The graphs in this section also show a detachment between short-term and long-term rates and the sluggish response of the latter to the former. This raises the question whether the EMU has somehow contributed to a more unstable link between short-term and long-term rates for the EA as a whole.

4.1.2 The Credit Channel

Theory

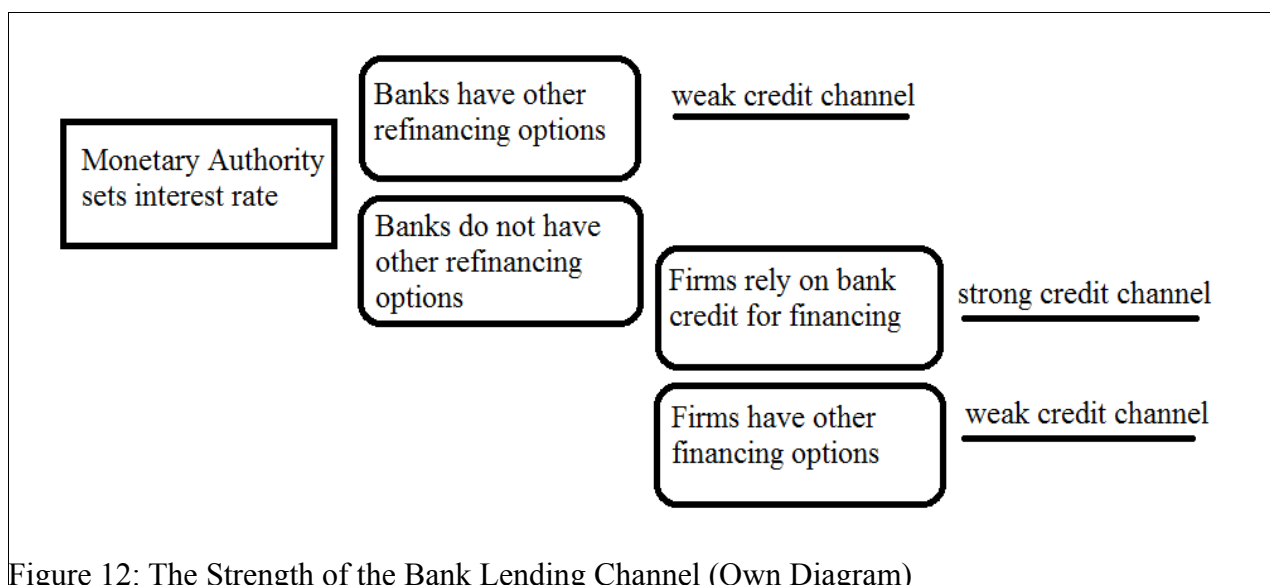
A critical point about the interest rate channel is that, theoretically, it operates under the assumption of no capital market imperfections, meaning that financial markets efficiently allocate capital. This implies that it focuses on the aggregate variables in the economy and not on distributional aspects of monetary policy, which stem from financial market frictions. This does not mean that the interest channel is wrong, but in the presence of financial market frictions it is almost certainly incomplete. It has been shown that the interest channel alone cannot explain the cyclical behaviour of a number of aggregate demand components, such as investment and inventories, and problems of asymmetric information in the banking sector (Hubbard, 1995). One channel that puts a particular emphasis on financial market frictions is the credit channel of monetary transmission – it also supports the view that low interest rates are good for economic recovery, but emphasises the risk of structural

imbalances if rates are too low (see section 4.2.2).

Contrary to the interest channel the credit channel mechanisms rely mainly on the short-term rather than the long-term interest rates (Mishkin, 1996). Monetary policy affects the amount of credit supplied via the balance sheet channel and the bank lending channel. The balance sheet channel describes the idea that if monetary conditions become more restrained, the net-worth of borrowers falls for a number of reasons: the monetary tightening leads to an unexpected decrease in the price level. This jump leaves the real value of the firm's assets unchanged, but increases its nominal liabilities. Moreover it reduces expected future cash flows given that asset prices and profits tend to be pro-cyclical and contractionary monetary policy causes output to decrease via other transmission channels. Lower net-worth makes it harder for the borrower to obtain capital given that net-worth and lending conditions are inversely related. This is partially due to the fact that borrowers can provide less collateral and partially to an asymmetric information problem. The borrower has more information regarding the riskiness of the investment project than the bank and has an incentive to understate this risk. The bank wants to avoid this moral hazard problem, because it bears the costs of the bankruptcy if it gives out a loan. It therefore becomes rational for the bank to raise credit standards to decrease the adverse selection problem and thus to constrain credit and therefore firm investment. The balance sheet channel thus gives borrower heterogeneity an important role in the transmission mechanism (Cecchetti, 1995; ECB, 2009; Mishkin, 1996). The chain of events has been famously formalised by Stiglitz & Weiss (1981). This part of the credit channel, where a fall in the borrower's net-worth leads to an increase in the external finance premium for borrowers and thus a fall in credit is often referred to as the “financial accelerator”, a term coined by Bernanke et al. (1994, 1999). It explains how relatively small changes in interest rates can have potentially large impacts on investment via credit rationing via an increase in credit spreads (Cecchetti, 1995). A recent empirical study by Gertler & Karadi (2014) provides compelling evidence on this phenomenon.

The second channel is the bank lending channel. It refers to the bank's ability to service credit demand. Banks largely finance themselves through deposits and short-term loans, therefore, if the CB raises the interest rate, the costs of refinancing on the interbank market increase and credit supply decreases. Figures 23 and 24 suggest that this reduction in loans is mostly due to the demand of loans in the presence of higher credit standards, as banks seem to pass on their increased

financing conditions to their customers. In addition, increasing rates are often accompanied by a fall in asset prices, which deteriorates the balance sheet position of the credit institution. In the case that banks play an important role for the extension of credit to certain classes of borrowers, the decrease in available funds leads to less credit for these borrowers and thus less investment spending if the borrowers rely on bank loans (ECB, 2008; Mishkin, 1996). The overall importance of monetary policy on the real economy via the banking sector therefore depends on whether borrowers can substitute bank loans with other forms of financing and whether banks can substitute CB liquidity through other forms of short-term funding. If the answer to both questions is negative, then a temporary shortage of liquidity for the banking sector can have strong economic implications via the availability of loans to the real economy (Cappiello et al., 2010; ECB, 2008).



Empirical Analysis

Pre- and post-crisis data across regions on the credit market confirms the strong divergence. Figures 13, 14 and 15 depict the development of loans on the balance sheets of NFCs (non-financial corporations) in millions of Euros and as a percentage of country GDP over time. The left axis in the diagrams has different scales as the loans-to-gdp-ratio of the NFC sector developed very different in the EA, Germany and Spain. Its volatility and mean were lowest in Germany and highest in Spain. Currently debt levels in Spain remain high.

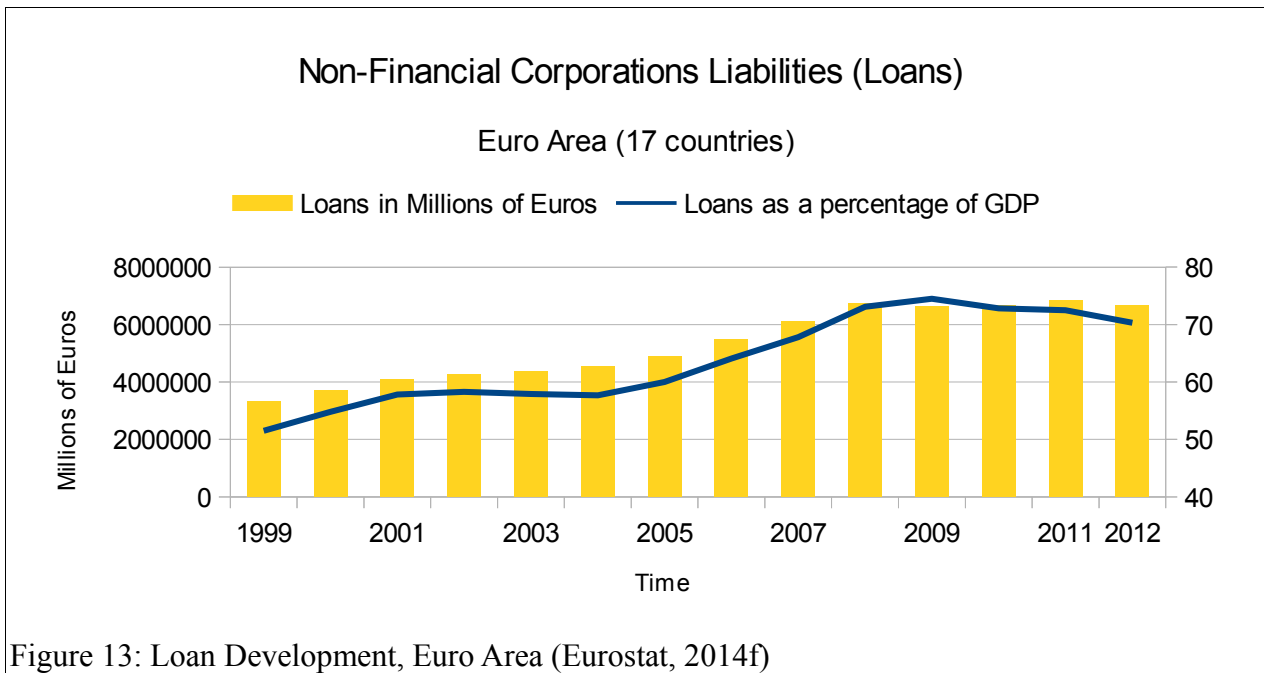


Figure 13: Loan Development, Euro Area (Eurostat, 2014f)

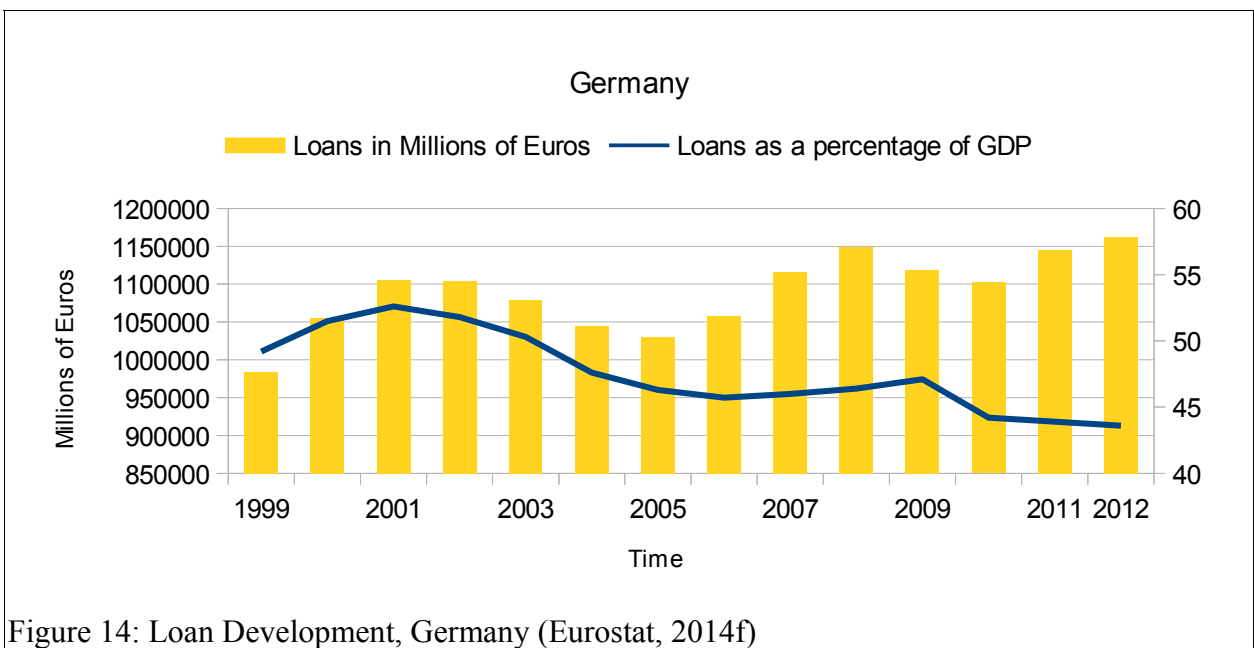


Figure 14: Loan Development, Germany (Eurostat, 2014f)

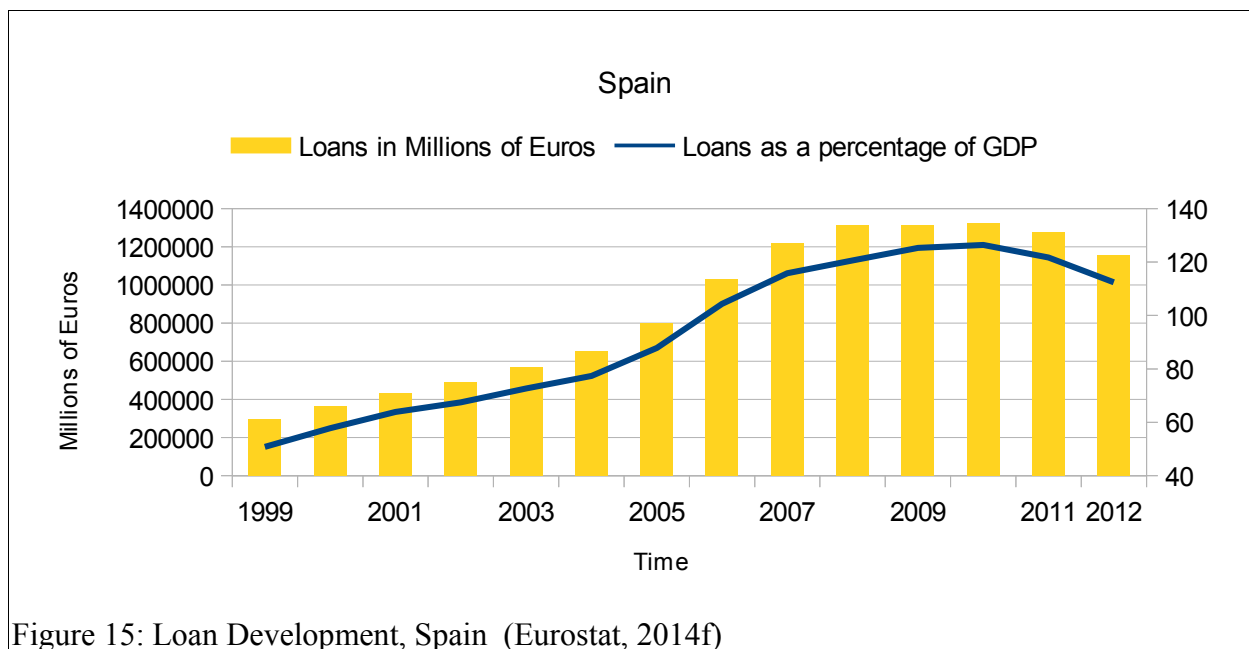


Figure 15: Loan Development, Spain (Eurostat, 2014f)

Some researchers have investigated both the effects on the ability and the willingness of banks to lend during the crisis. The evidence suggests that in the countries under financial stress (Ireland, Greece, Portugal, Spain and Italy) the bank lending channel was a constraint on the banks ability to lend until Q4 of 2009, while the borrowers' net-worth, particularly of SMEs, had a negative effect on credit supply for the whole period. In the other European countries in the sample both aspects of the credit channel are insignificant (Ciccarelli & Maddaloni, 2013). This suggests that monetary policy played a different role for the periphery and the core countries.

Microeconomic data from the SAFE illustrates the development of the access to finance for Spanish and German Small and Medium- Sized Enterprises (SMEs): It clearly shows that from this perspective as well, the needs of Germany and Spain are very distinct. The latest available data from the SAFE (2013) still indicate that SMEs in Spain and to a lesser extent in the EA at large struggle to obtain the financial means they need. Figure 16 shows the averages between 2010 and 2013 of how many firms reported to have applied or not applied for a bank loan in the past 6 months. The percentage applying is highest in Spain with 31% of firms applying for a loan, compared to Germany and the EA with 22% and 25%, respectively. In Germany, almost 60% of the firms report that the reason for not applying are sufficient internal funds, which is consistent with the comparatively good turnover and profit situation for German firms (ECB, 2014d).

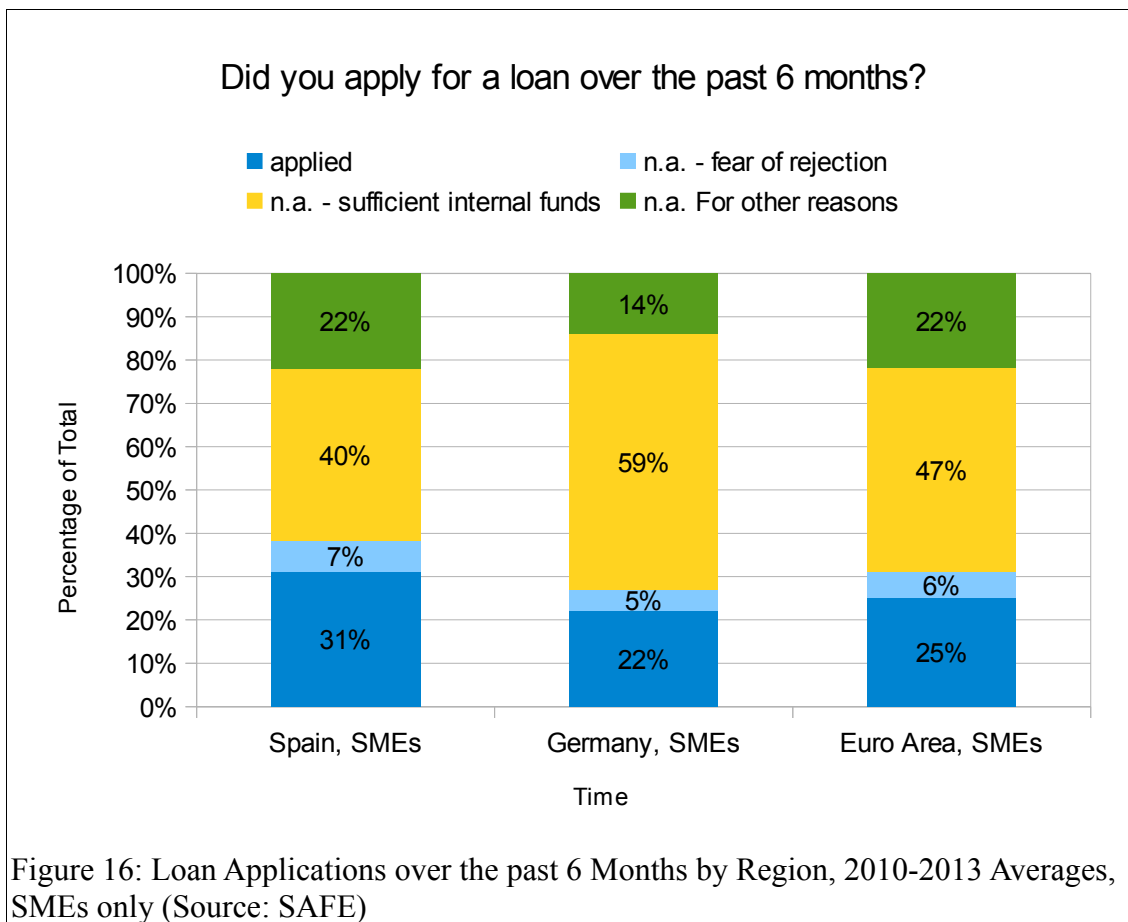
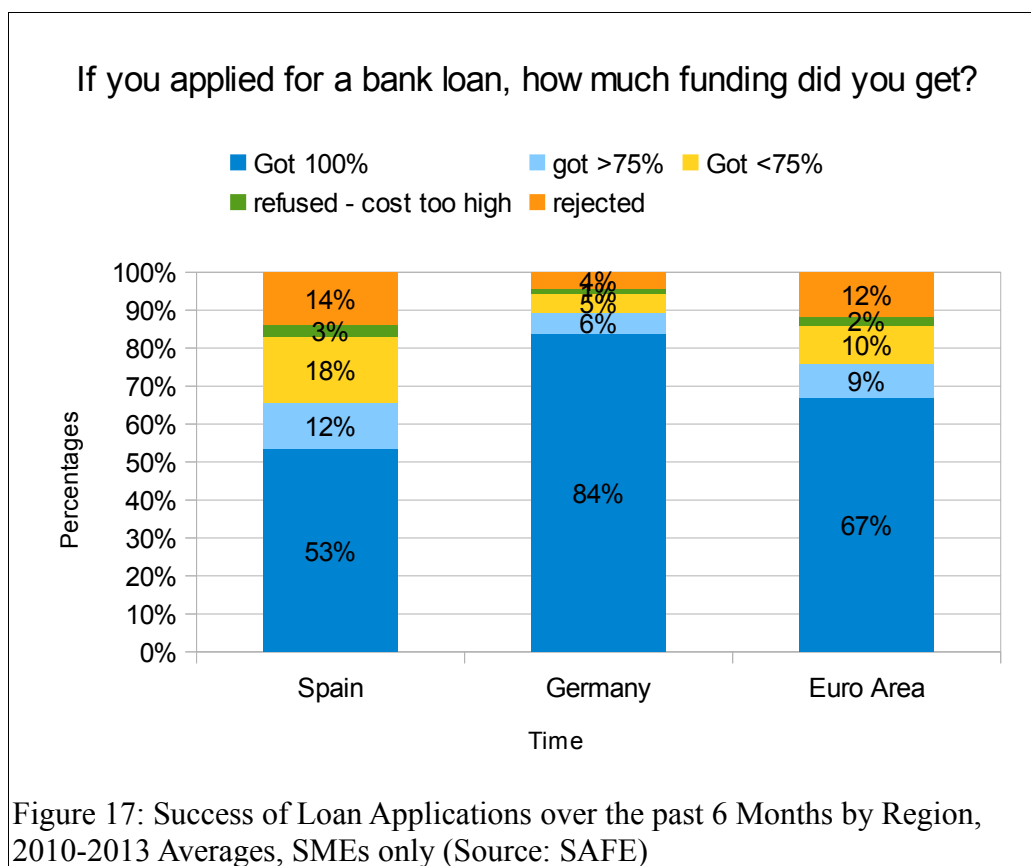


Figure 17 shows the outcomes of the application process for the firms who applied. The differences between the three regions are pronounced. While 84% of German firms got exactly what they applied for, in Spain only half of the firms got what they applied for and 17% got rejected or refused the offer. The EA figures lie in between those two extremes. Comparing the survey periods with each other shows hardly any variation on average in the EA, but marked variation in Spain (Figure 18). The availability of funding worsened gradually until the end of 2012, after which it started improving again. This sharp decrease in credit availability coincides with the second Spanish bank crisis at the end of 2012, which resulted in a rescue package worth €100bn from the European Union for a number of Spanish credit institutions (Tremlett, 2012).



The data indicate that Spanish firms are still severely credit constrained, because banks are unwilling to lend. Given the fact that the policy rate is close to zero it is unlikely that monetary policy could markedly worsen this situation via the bank lending channel. Credit constraints could also be due to the fall in the profitability of giving out loans due to the development of the spread between the deposit and the loan rate depicted in Figure 23. Raising the policy rate is most likely going to narrow the spread in the short-run, which could lead to further credit restrictions. Furthermore, as pointed out by Cicarelli & Maddaloni (2013) borrower's net-worth has been a constraint, given that banks are cautious about who to lend to. Raising interest rates could lead to further restrictions on credit through the balance sheet channel.

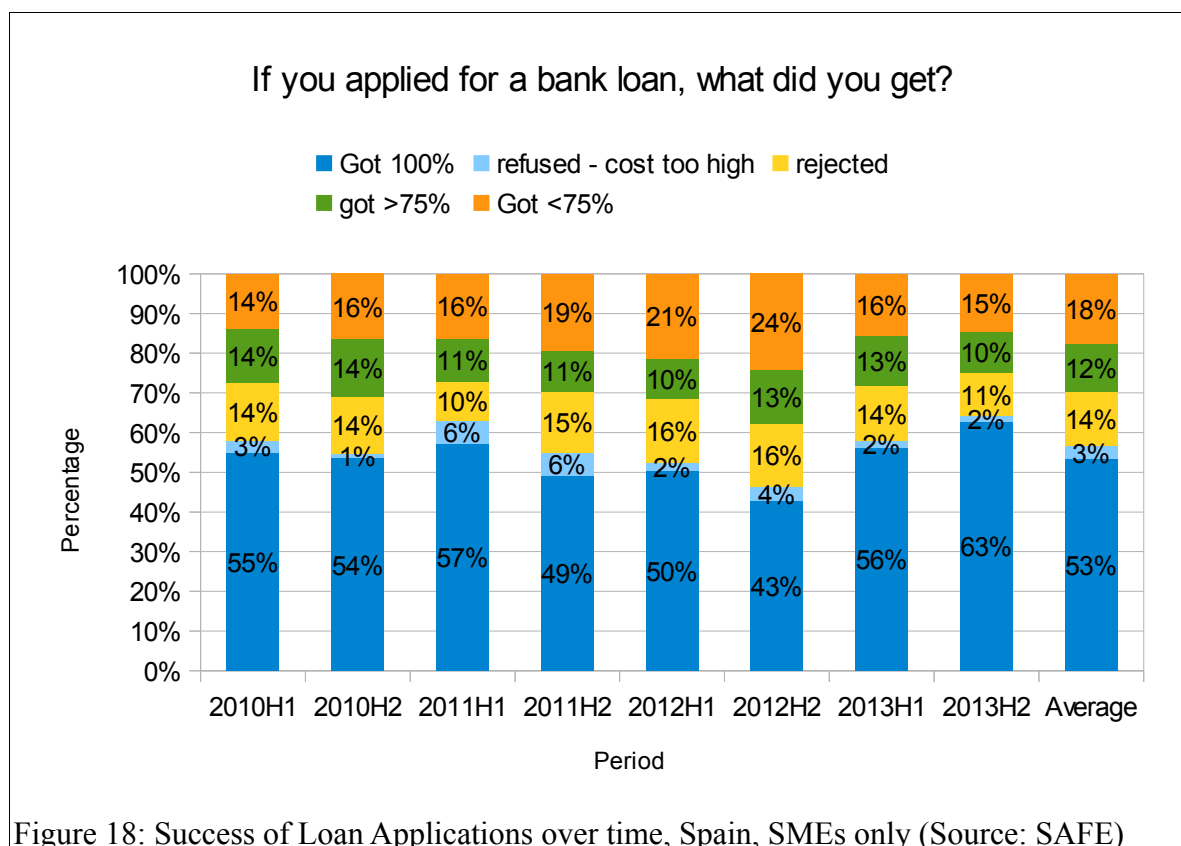


Figure 18: Success of Loan Applications over time, Spain, SMEs only (Source: SAFE)

In the current situation interest changes and credit markets are also tied to a financial stability concern. The ECB has defined financial stability „as a condition in which the financial system – intermediaries, markets and market infrastructures – can withstand shocks without major disruption in financial intermediation and in the effective allocation of savings to productive investment.“ (ECB, 2013, p.6). Under normal conditions, rising interest rates have a negative effect on economic activity, but in the current situation of high uncertainty and high debt levels, raising interest rates could potentially trigger a wave of mass bankruptcies and further financial turmoil. This depends on how vulnerable economic agents are to interest raises. This section focuses on NFCs, even though for completeness one would have to take into account the situation of households as well. The indebtedness of the corporate sector in both the EA (70% Loans-to-GDP) and Spain (110% Loans-to-GDP) depicted in Figures 13 and 15 could be considered alarming, as it implies that both regions are particularly vulnerable to interest rate raises. In addition, Figures 13-15 show that six years after the crisis the loan-to-GDP ratio is still high in Spain and the EA and declining only slowly. Figures 19-21 illustrate data from the SAFE regarding the percentage of firms reporting that their net interest payments (interest expenses minus interest income) have been

increasing over the past 6 months. In the EA the percentage peaked in 2011H2 and has since then declined to 28%. However, there are still more firms reporting an increase in their interest payments than a decrease, which implies that the percentage of firms becoming more vulnerable to an interest rise is most likely increasing.⁷ The same is true to an even more worrying extent for Spain, where between 2010 and 2013 on average 48% reported a net interest increase and only 12% a decrease. Similar to the EA, the percentage of firms with increased interest payments seems to be declining, which could be in line with the slow economic recovery indicated by the macroeconomic data. German data shows a trend towards reduced net interest levels. An even more meaningful indicator is the ratio of interest payments to earnings: The Economist (2013b) reports that in 2013 40% of corporate debt in Spain was still owed by companies who were unable to cover their interest payments from their pre-tax earnings. The estimated figures for Portugal and Italy were 50% and 30% respectively. These are the companies that rely on continued credit support by banks to be able to survive and are particularly vulnerable to changes in their nominal debt contracts.

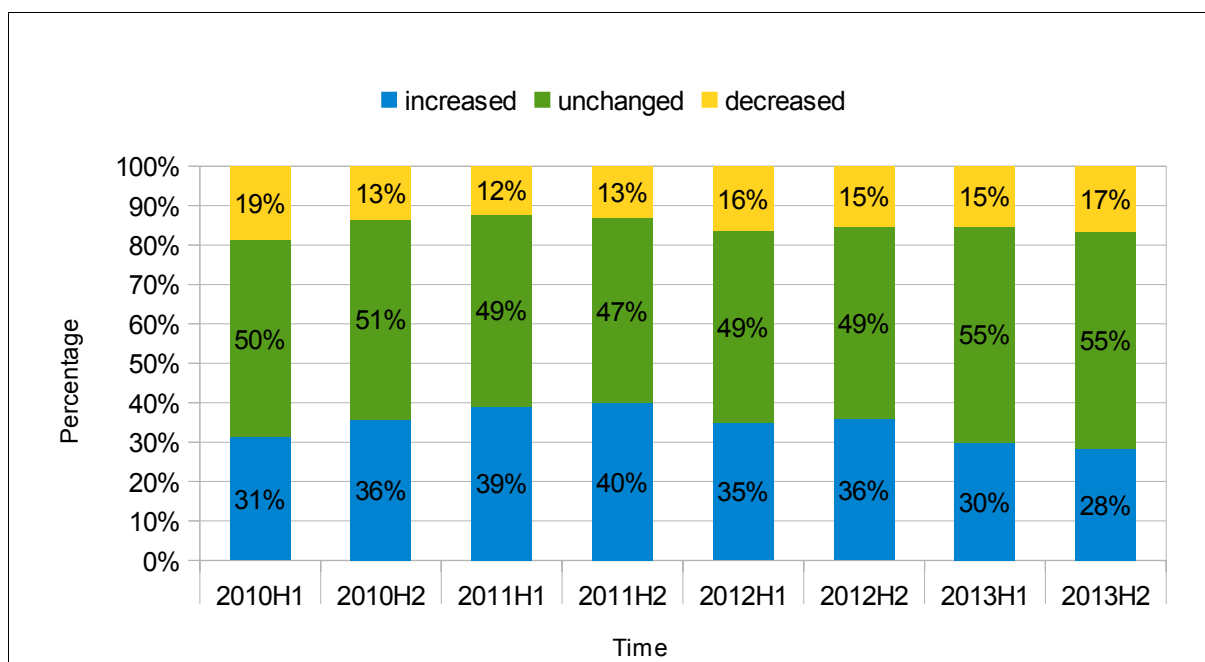
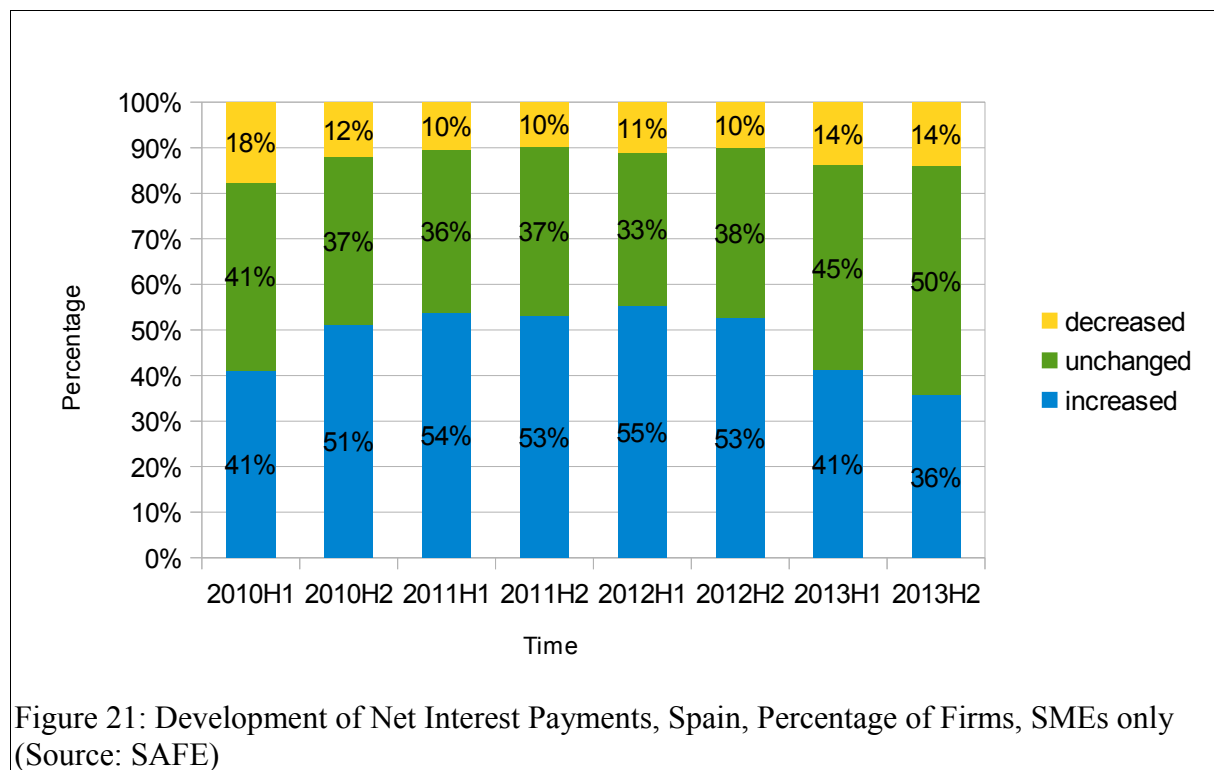
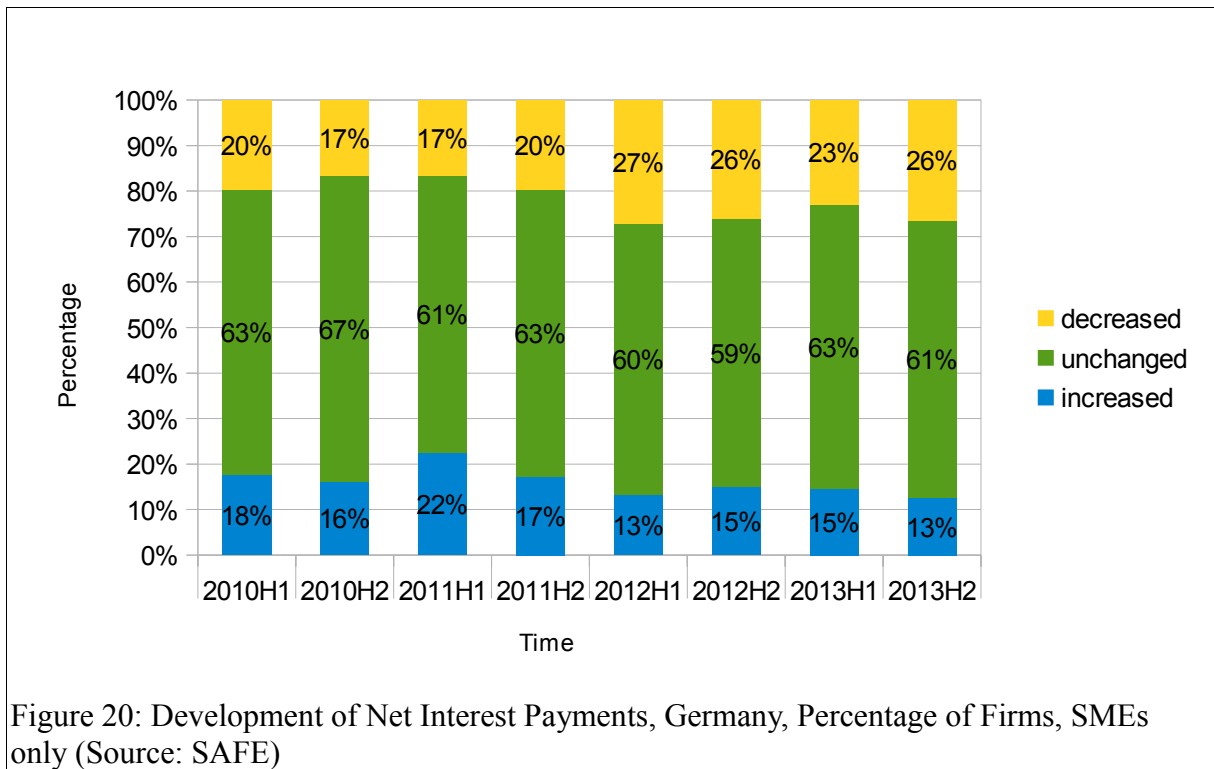


Figure 19: Development of Net Interest Payments, Euro Area, Percentage of Firms, SMEs only (Source: SAFE)

⁷ It should be noted again that the SAFE data is severely limited by the fact that it does not include information on the size of changes.



In addition, Figure 22 shows a strong growth of the percentage of risky loans on Spanish bank balance sheets, which illustrates that it could hit banks hard if interest rates rise. Until now banks have put off taking larger shocks to their balance sheets. An estimation of PwC suggests that European lenders will need to unwind €2,5 trillion of loans over the next years of which an estimated € 1 trillion could be non-performing. This process has been only picking up very slowly over the past years, amid fears of insolvencies and subsequent job losses (Stothard, 2013). Raising interest rates could accelerate this process to a point where it puts extreme stress on the financial system.

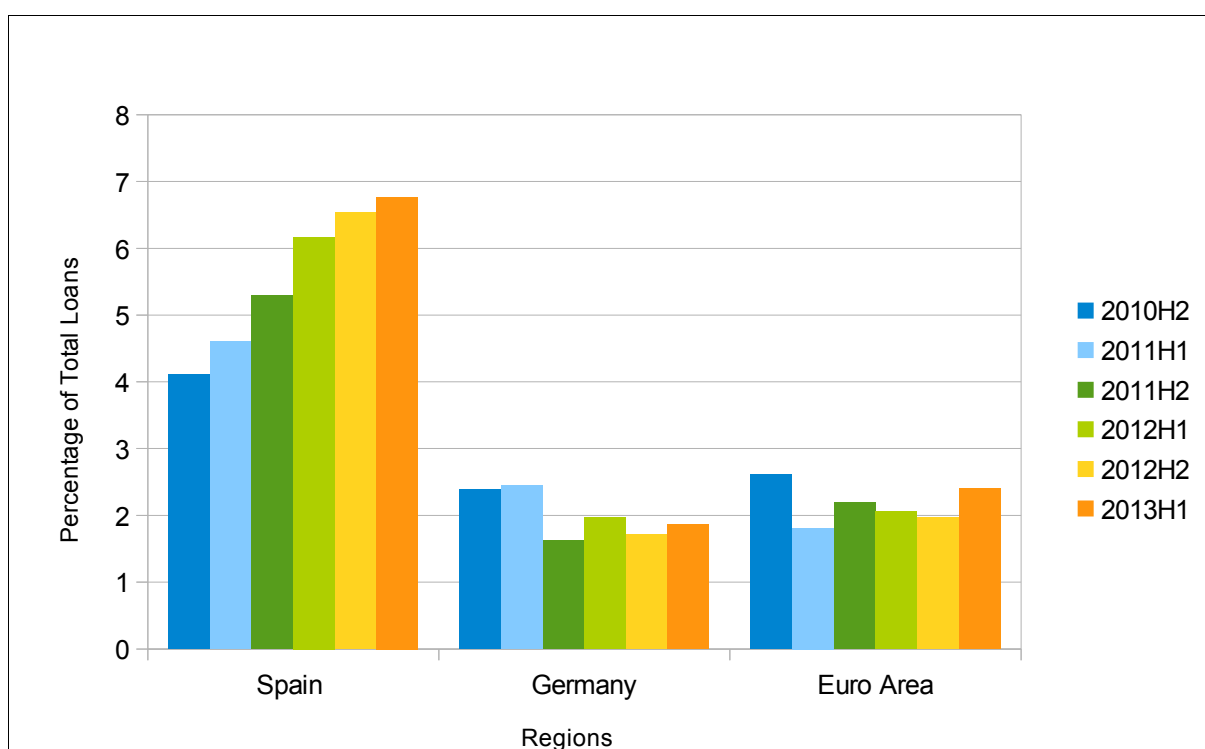


Figure 22: Development of Gross Total Doubtful and Non-Performing Loans as a Percentage of Total Debt Instruments and Total Loans and Advances (All Domestic Banking Groups and Stand-Alone Banks) over Time and across Regions (SDW, 2014c)

4.2 Risk Associated with Leaving Monetary Policy Unchanged

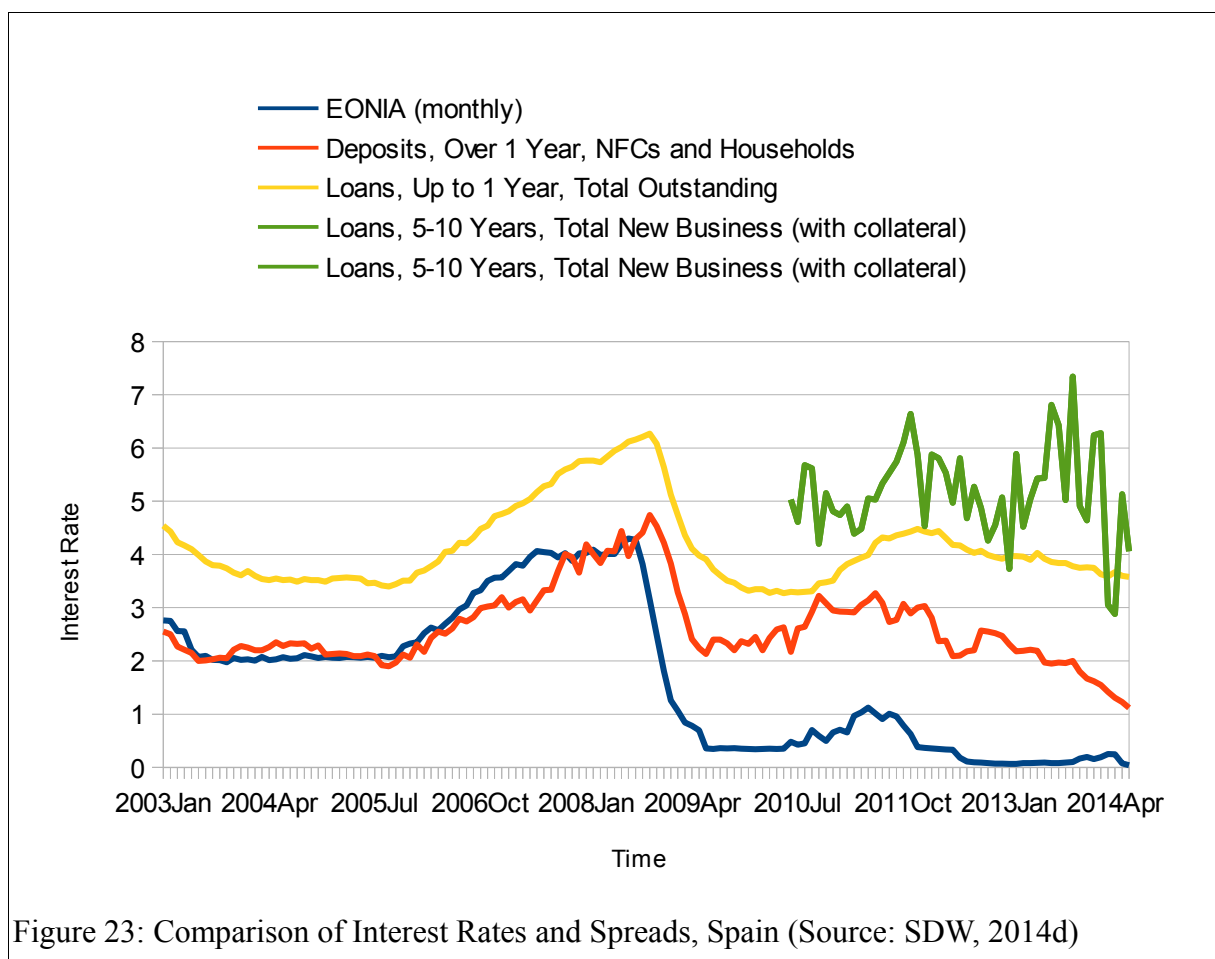
4.2.1 The Predictive Power of the Term Structure of Interest Rates

Section 4.1.1 has discussed the potential negative effects of raising short-term interest rates on the

EA recovery via its effects on raising long-term interest rates and lowering investment and consumption. Recently, a number of scholars have been looking more closely at the relationship between long- and short-run rates. Empirically, the term structure of interest rates has a large forecasting power for real economic activity. Between 1987 and 2008 US data shows a perfect almost one-to-one negative correlation between 4-quarter changes in the term spread and 4-quarter changes in the Federal funds target (Adrian et al., 2010). Adrian et al. (2010) review a substantial body of literature that has demonstrated that an inversion of the term structure is a stable predictor of recessions. Empirical results for the U.S. show that if the spread falls below a certain threshold in response to a monetary tightening, unemployment tends to rise (Adrian & Estrella, 2008). The traditional explanation for the predictive power of the term spread rests on the informational value conveyed by an inverted term structure for future economic activity. Adrian et al. (2010) provide an alternative, causal mechanism, which stresses the importance of bank balance sheets. Empirically financial intermediaries borrow to lend. In fact, they tend to borrow short-term and lend long-term, which implies that the term spread influences the marginal profitability of an extra dollar of loans. If the term spread is large, the net interest rate margin of banks increases and loans become more profitable. If the term spread decreases, so does the profit margin of banks and their willingness to give out loans. This mechanism suggests that a steeper yield curve may induce banks to lend more, because lending is more profitable for them. These effects are visible in a contraction or expansion of bank balance sheets and thus tie financial prices to quantities (Adrian et al., 2010). The mechanism is amplified by the balance sheet channel, which is discussed in section 4.1.2.

If the relationship between short-term and long-term rates was stable, the predictive power of the term-spread would not matter for monetary policy, because policy makers could control the term spread by controlling the short-term interest rate. As discussed in chapter 4.1. empirical data suggests otherwise. Figures 23 and 24 complement the analysis by showing the development of various bank interest rates in Germany and Spain over time. On the one hand, they show the financing side, namely the EONIA⁸, which is one of the main short-term refinancing rates on the interbank market, and the interest rates bank pay on short-term deposits for NFCs and households. On the other side the graphs show the rates banks currently get from their outstanding portfolio of loans with 1-year maturity and rates they charge for new and secured loans with 5-10 year maturity.

⁸ Recall that the EONIA is normally extremely close to the ECB's main policy rates.



For Germany the graph shows that the deposit rates followed the EONIA closely, while the loan rates of both maturities have been falling simultaneously. The spread between the financing and lending side has been relatively constant during the crisis, suggesting that the profitability of the core bank business hasn't been severely affected in Germany. The developments in Spain illustrate a different story. The deposit rates did not fall with the EONIA, but stayed largely at their pre-crisis level, which led to a narrowing in the interest spread between outstanding loans and outstanding deposits. The spread was almost zero in 2011 and has started to widen since then as deposit rates started falling in early 2013. It is also notable that the rate for long-term loans has been rather volatile, but clearly above the rate for outstanding, short-term loans. Given the sluggish adjustment or even slight disconnect between short-term and long-term rates evidenced by Figures 11, 23 and 24 there could be a risk of leaving short-term interest rates low for too long. If long-term rates adjust only slowly, they could continue to fall or stagnate as short-term interest rates rise and narrow the term spread, triggering unanticipated economic consequences.

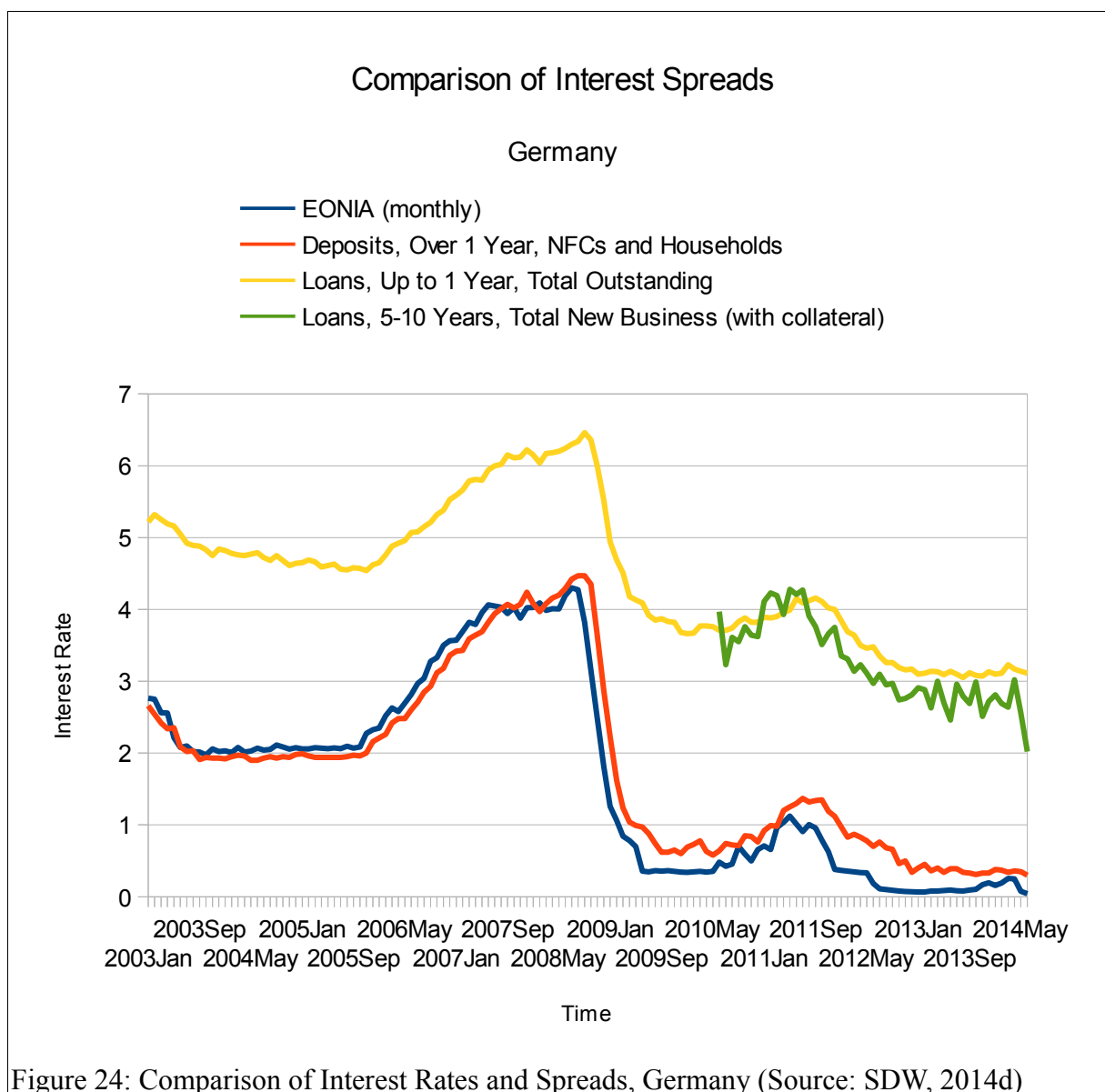


Figure 24: Comparison of Interest Rates and Spreads, Germany (Source: SDW, 2014d)

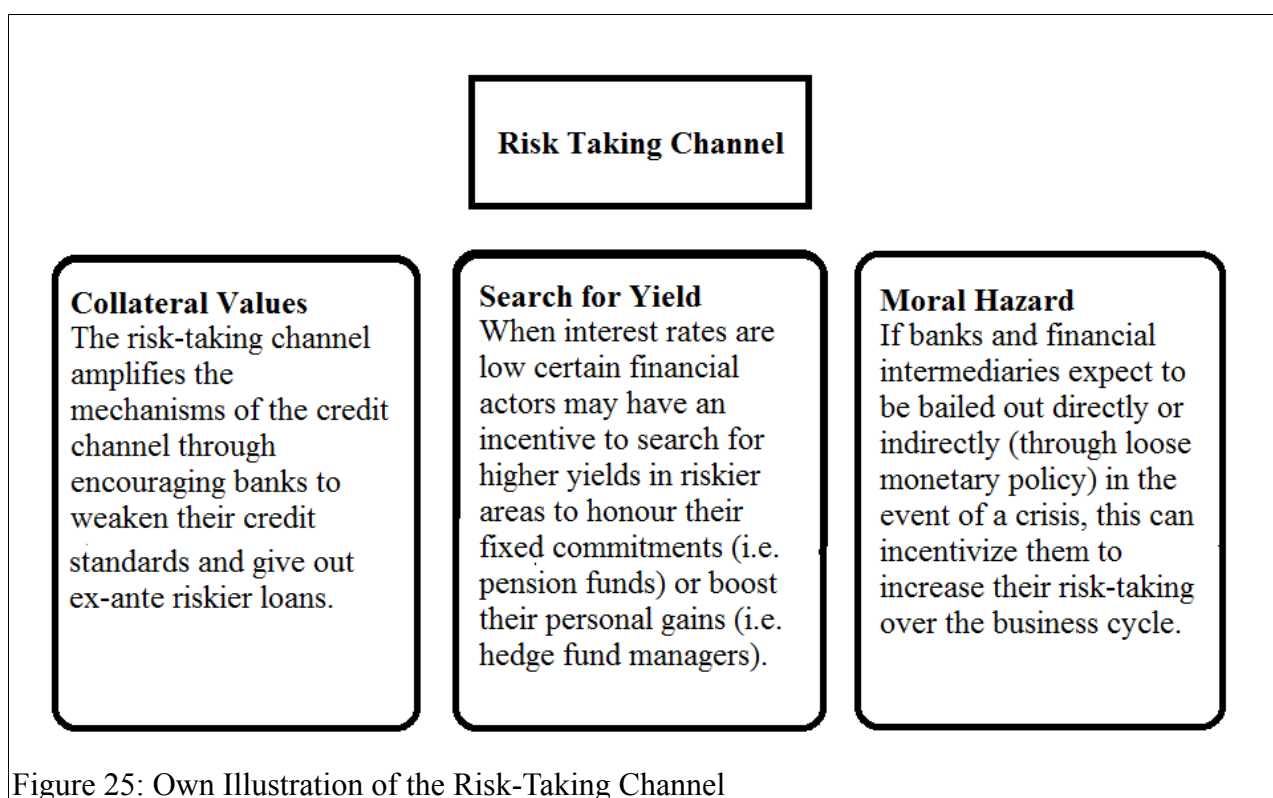
4.2.2 Credit, Asset prices and Business Cycles

Theory

Sections 3.3. and 3.4 have discussed the Taylor rule and how it provides a metric for assessing whether monetary policy might have been too expansionary over certain periods. A substantial body of literature has established that interest rates that are set too low can cause a number of structural imbalances in the economy and can amplify business cycles. First of all, borrower's net-worth is strongly pro-cyclical via its link to cash flows and economic activity. Secondly, credit markets are

tied to asset prices, which also exhibit strong pro-cyclical tendencies. During a boom asset prices rise and output increases which increases cash flows and borrowers' net-worth and therefore the availability of financial resources. One of the most seminal contributions in this area is a model by Kiyotaki & Moore (1997), which shows the effects of a fall in the net-worth of borrowers on credit and aggregate output. In the most basic model, land functions as a means of production and as collateral and there are some credit-constrained and some unconstrained firms. If the net-worth of the borrowers falls due to a productivity shock, the constrained firms are unable to borrow and to invest in land, which reduces the demand and therefore the price of land. This is the immediate effect in period t . However, the more important effect in the model is the dynamic effect. Due to their inability to invest in the previous period and the lower worth of land, constrained borrowers produce less and their net-worth falls even more in subsequent periods. Kiyotaki & Moore (1997) show how this model and extension of the model can create credit and output cycles through these static and dynamic multiplier mechanisms. Similar models include Shleifer & Vishny (1992) and Bernanke & Gertler (1989, 1995). These models provide mechanisms that tie credit to asset prices and subsequently to borrowers' net-worth.

In the aftermath of the financial crisis, a number of scholars have argued that risk was an overlooked component in this discussion and have advocated the inclusion of a risk-taking channel of monetary transmission (Borio & Zhu, 2012; Rajan, 2010; Taylor, 2009). Economists have treated risk as exogenous in most standard models, partially due to the fact that these models rely on rationality and linearisation and are often unfit to deal with the issues related to risk and long-term cycles (Borio & Zhu, 2012). The risk-taking channel focuses on the impact of changes in monetary policy on the behaviour of economic agents through their perception of risk or behaviour towards risk. Figure 25 illustrates three aspects of the risk-taking channel.



Firstly, the risk-taking channel adds to the explanation of the correlation between credit, asset price and business cycles via the amplification of the pro-cyclical nature of financial markets, similar to the mechanism illustrated above (Cappiello et al., 2010). It has been shown that liquidity and risk-taking can reinforce each other and create positive feedback loops (Adrian & Shin, 2009; Borio & Zhu, 2012). A number of studies have demonstrated that easier (tighter) monetary policy is in fact associated with weaker (tighter) credit standards (e.g. Altunbas et al., 2010; Jimenez et al., 2014; Dell'Ariccia et al., 2013; Gaggl and Valderrama, 2010). Jimenez et al. (2014) conduct a study using micro-data from Spain since 2002. They find that, when the monetary policy rate was lowered, banks with low capitalisation granted more loans to ex-ante risky firms than highly capitalised banks. These banks also required lower collateral and lent higher amounts. The literature suggests that during an economic boom the risk in the banking system increases not only because capital-constrained banks lend more, but also because there is a shift in the composition of the loan portfolio. Particularly loans granted at later stages of credit booms have higher ex-post default rates (Borio & Zhu, 2012). Some of the studies find that the effect is amplified by high securitisation, weak bank regulation and the duration of the low-interest rate environment (e.g. Maddaloni & Peydro, 2011).

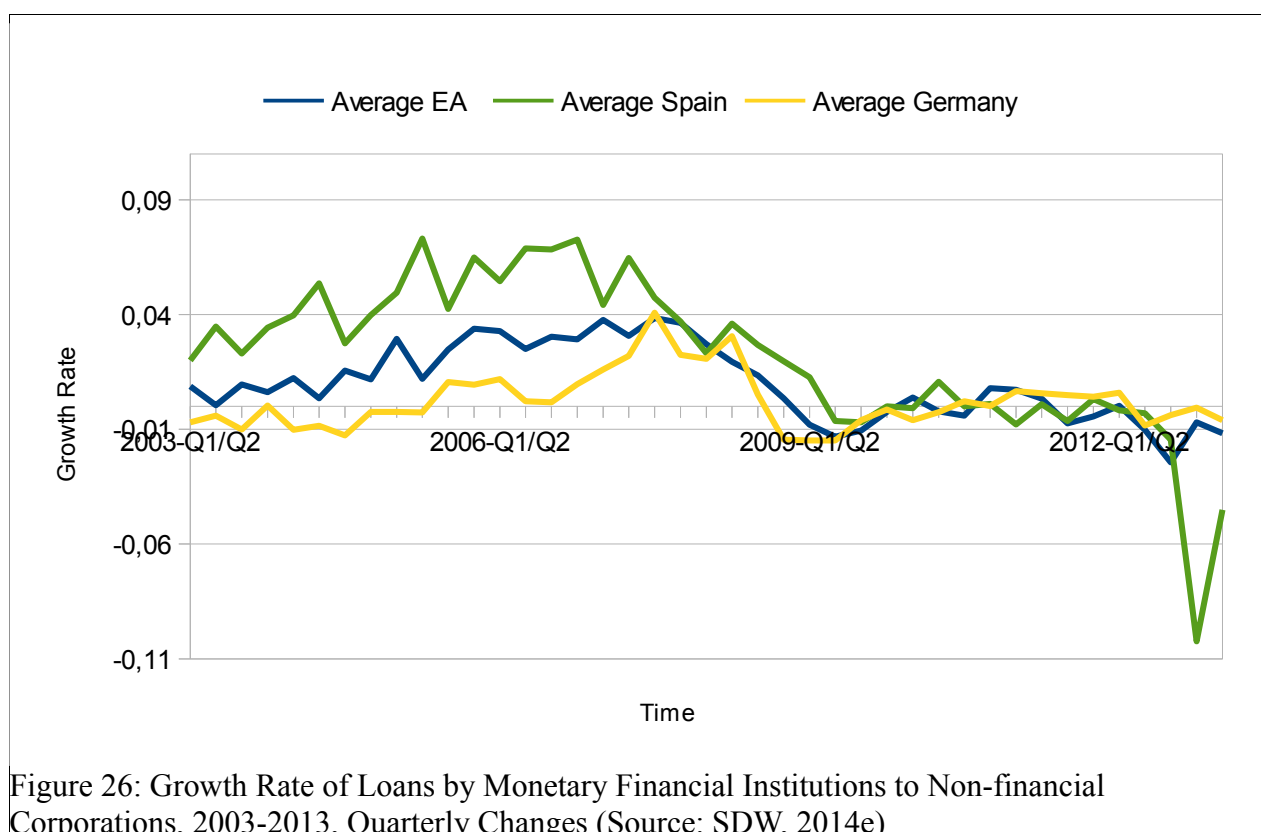
Secondly, target rates of returns can often be rather sticky, due to long-term contracts, regulations, institutional arrangements or difficulties in adjusting expectations to new situations (Borio & Zhu, 2012). Pension funds or insurance companies, for instance, have fixed-rate commitments. If safe investments do not pay an interest rates high enough to honour their contracts, these firms will engage in a “search for yield” as their only survival strategy, meaning that they will invest in risky projects, booming assets or other speculative forms of investment. This form of risk shifting is also present in other financial domains due to misaligned incentives. Managers of financial intermediaries – particularly, but not exclusively, in the shadow banking sector – operate under strong competition and a lack of supervision and personal stake in their decisions. In fact, the compensation function of investment bankers is often convex in returns, which means that it encourages risk taking as there is a large upside and a limited downside to risk. This combination leads to a variety of behaviours (e.g. herding, underestimating tail risks) which increase systemic risk. These incentive distortions can be aggravated by low monetary policy rates given that the compensation of managers is proportional to their rate of return, which is automatically higher when the risk-free rate is higher. Moreover, the lower the risk-free rate, the easier it becomes to use leverage to boost returns (Rajan, 2005). These effects can be amplified if monetary policy makers engage in forward guidance or economic agents expect bailouts. Through more transparency and forward guidance CBs can lower the risk premium by suggesting that they will do everything in their power to keep inflation stable. The effects of this policy can be highly asymmetric, if there is an “insurance effect”, where agents expect the CB to ease monetary conditions in downturns. In this case, banks and other financial intermediaries expecting to be “rescued” by the CB intervention can have an incentive to increase risk-taking over the business cycle (Borio & Zhu, 2012).

The increased interest in the effects from the credit and risk-taking channel of the MTM is related to the fact that it can lead to boom-and-bust cycles similar to the recent financial crisis. Many studies have established a strong link between credit and asset price growth and financial crisis (Borio & Lowe, 2002; 2004; Eichengreen & Mitchener, 2003; Kindleberger, 2005, chapter 4). A number of authors show that credit growth empirically has the highest correlation with banking crisis out of a number of factors (Gourinchas & Obstfeld, 2012; Schularick & Taylor, 2012). The costs of downturns associated with credit bubbles are substantial (Jorda et al., 2013; Reinhart & Rogoff, 2009). For this reason there has been much debate about whether monetary policy contributes to these developments: The body of literature, which claims that financial deregulation and loose

monetary policy are two of the main contributing factors to unsustainable credit booms is growing (e.g. Detken & Smets, 2004; Goodhart & Hofmann, 2008; Reinhart and Rogoff, 2008; Rajan, 2005). Taylor (2007) and Ahrend et al. (2008) show how low interest rates can fuel house price inflation, which in turn leads to higher demand and investment, improved credit standards and more sub-prime loans. More supporting evidence comes from the literature discussed in section 3, which emphasises how asymmetric policies within the EMU have contributed to imbalances given that the EMU does not have OCA properties. On the other side, many authors, particularly policy makers, deny that monetary policy was overly expansionary before the crisis and significantly contributed to a housing or credit boom. Bernanke (2010) argues that econometrically there is only a weak correlation between monetary policy and house prices within the U.S. and in cross-country studies and that other factors may be better suited to explain asset price bubbles.

Empirical Analysis

The debate is not yet settled, but a growing body of research points to the fact that loose monetary policy and keeping interest rates low for a pro-longed period of time can distort market incentives and lead to structural imbalances, excess credit and unsustainable asset price rises. Given that the ECB currently uses forward guidance, promising low short-term interest rates for a pro-longed period of time to bring down long-term rates, these effects of low interest rates and expansionary policies need to be monitored closely. Figure 26 shows the development of the growth rate of loans by Monetary Financial Institutions (MFI) to NFCs. Before the crisis growth rates were particularly high in Spain and rather subdued in Germany. This development fits well into the discussion of the macroeconomic developments in Germany and Spain and how they were affected by monetary policy in the pre-crisis period. Since the onset of the crisis, credit growth has been oscillating around zero in Germany and the EA. This implies that at least in the short-run there is little risk of another credit-fuelled boom, even in Germany. Spanish credit growth has clearly not yet recovered from the crisis.



Previous sections have shown the development of term spreads, which has eroded bank profitability in parts of Europe. Dobb et al. (2013) estimate the losses for banks due to the extremely low interest rates between 2007 and 2012 at -\$230 billion. Life insurance companies were similarly negatively affected. In the current situation, a search for yield could therefore be a potential risk: Fears of another housing bubble are currently particularly present in the UK, but may have some spillover effects on other economies like Spain. The Financial Times reports that investors have started to regain confidence in the Spanish property markets (Johnson, 2013; Financial Times Reporters, 2014), but these trends cannot be confirmed by looking at data on the house price index on residential property, which is available until the final quarter of 2013 (Figures 27 and 28). Only the German property market has been increasing in value between 2010 and 2013. This development is, however, not particularly alarming, as the German property and construction sector hasn't grown much during the crisis and has long been considered undervalued (The Economist, 2013a). Nonetheless, if the Taylor rule estimations in section 3.4 can be considered reliable, there could be a connection to the relatively loose monetary conditions in Germany.

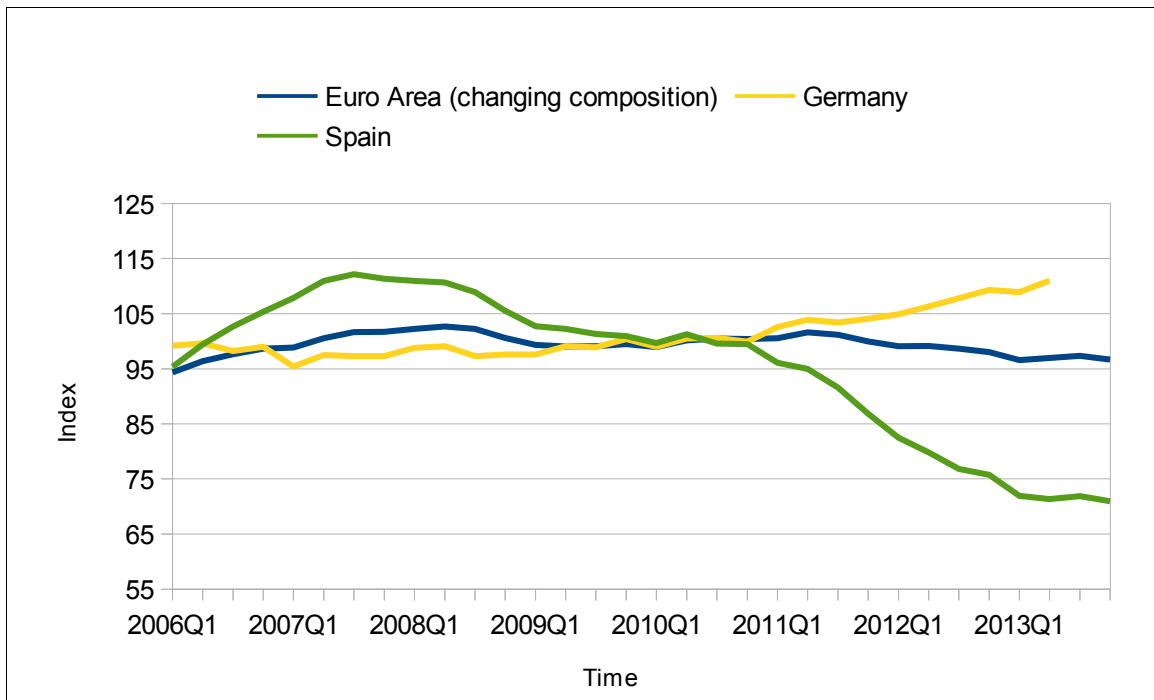


Figure 27: Regional Comparison of the Development of the House Price Index on Residential Property (2010 = 100) (Eurostat, 2014d)

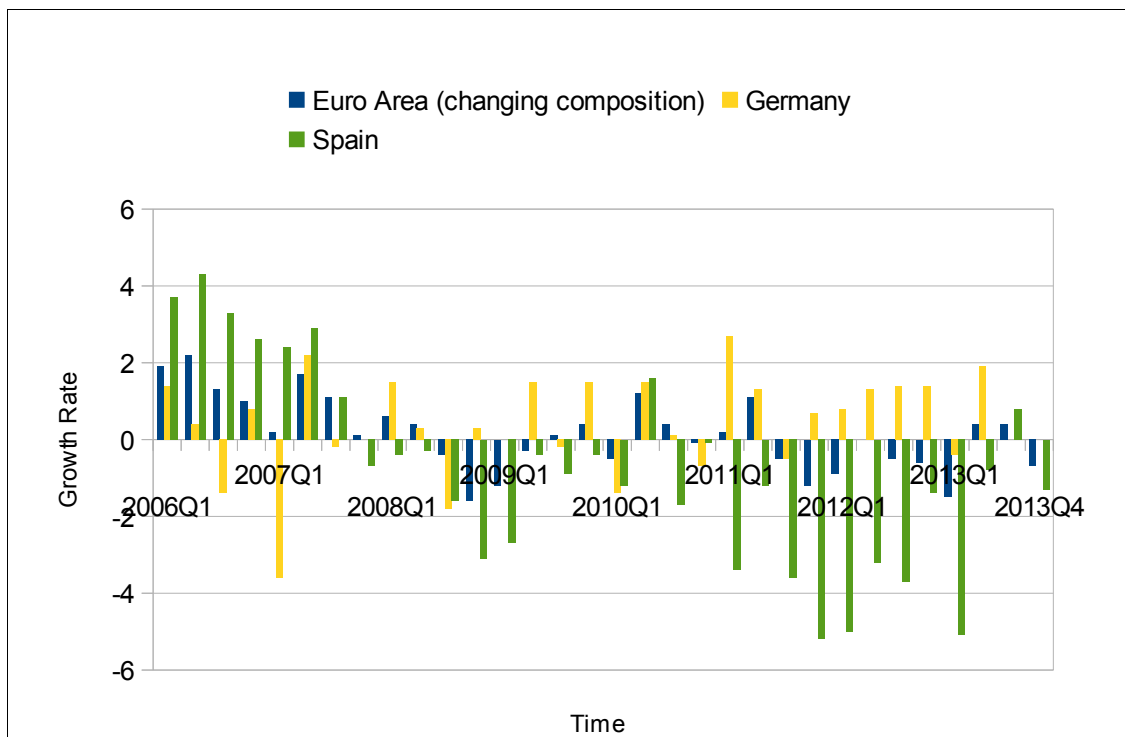


Figure 28: Quarterly Growth Rates of the House Price Index on Residential Property (2010 = 100) (Eurostat, 2014d)

Dobb et al. (2013) report on the development of other asset classes: Bond prices increased as interest rates fell, but there is no significant evidence of a rise in equity-prices and price-earnings and price-book ratios are close to their long-term averages in the EA. Evidence suggests that investors have looked for higher returns in emerging markets as purchases of emerging market bonds by foreign investors increased from \$92 billion in 2007 to \$294 billion in 2012 (Dobb et al., 2013). Similar trends exist in the banking sector with Spanish banks such as Santander and BBVA expanding heavily towards Latin America in the face of low profits within Europe (Wheatley, 2012). The data shows very little risk of short-term imbalances due to asset price or credit growth, despite the fact that the Taylor rule estimation in section 3.4 suggests loose monetary conditions, particularly for Germany. This could be due to two main factors: firstly, the sluggish economic recovery and uncertainty regarding the future prospects of the EA and, secondly, the development of macro-prudential regulations outlined in section 3.4 and their dampening of the effects of monetary policy.

4.2.3 Restructuring and the Speed of Recovery

Theory

One downside of keeping interest rates too low is that it could impede the restructuring necessary to reduce the imbalances created during the boom. During an unsustainable credit-fuelled boom like the one before the financial crisis in countries like Spain, some industries grow faster than others. In particular, the non-tradable, speculative sectors increase their shares in total output. Figures 29 and 30 show such trends for Spain, especially in the construction sector, and to a lesser extent for the EA as a whole. Figure 31 supports this evidence by illustrating the path of the credit growth in the sectors with the highest growth rates on average between 2003 and 2007 in Spain. After the boom it is necessary for the economy that excess capacities built up during the boom are eliminated. This requires that the least productive and/ or most indebted firms become insolvent and make room for a sustainable and healthy recovery of the economy. However, after a financial crisis banks are in a vulnerable position (e.g. Figure 22) and do not want to take unnecessary hits to their balance sheets.

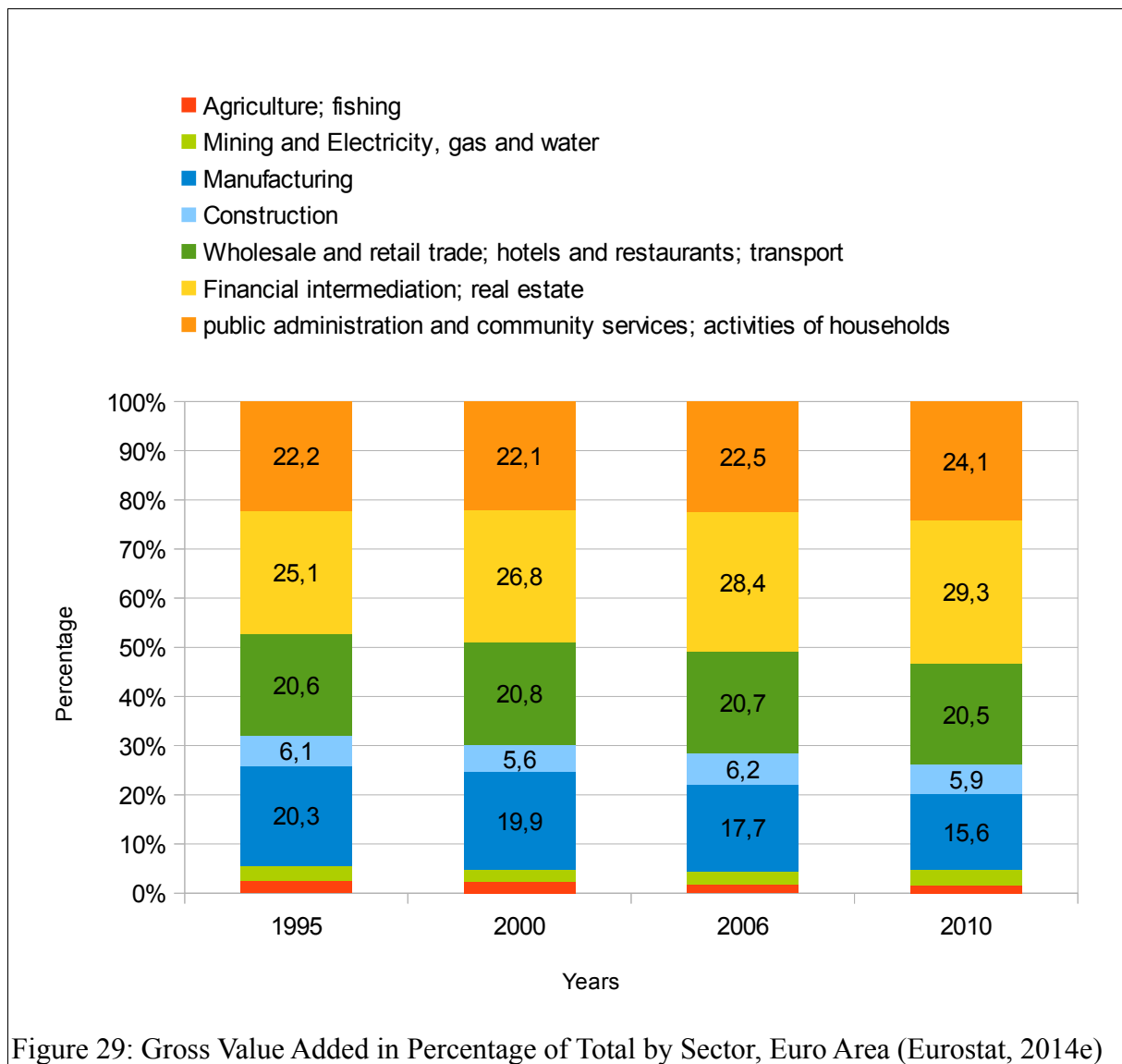


Figure 29: Gross Value Added in Percentage of Total by Sector, Euro Area (Eurostat, 2014e)

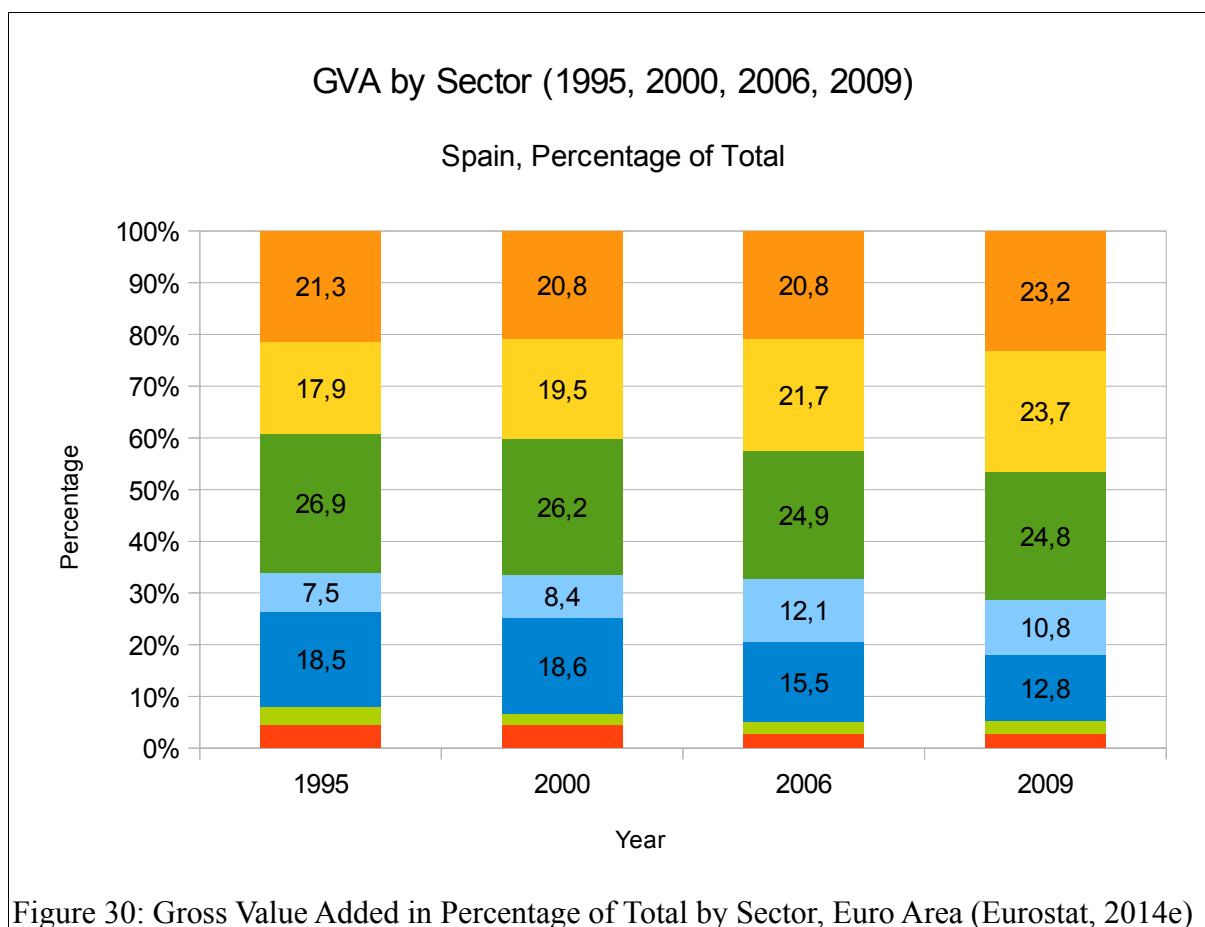
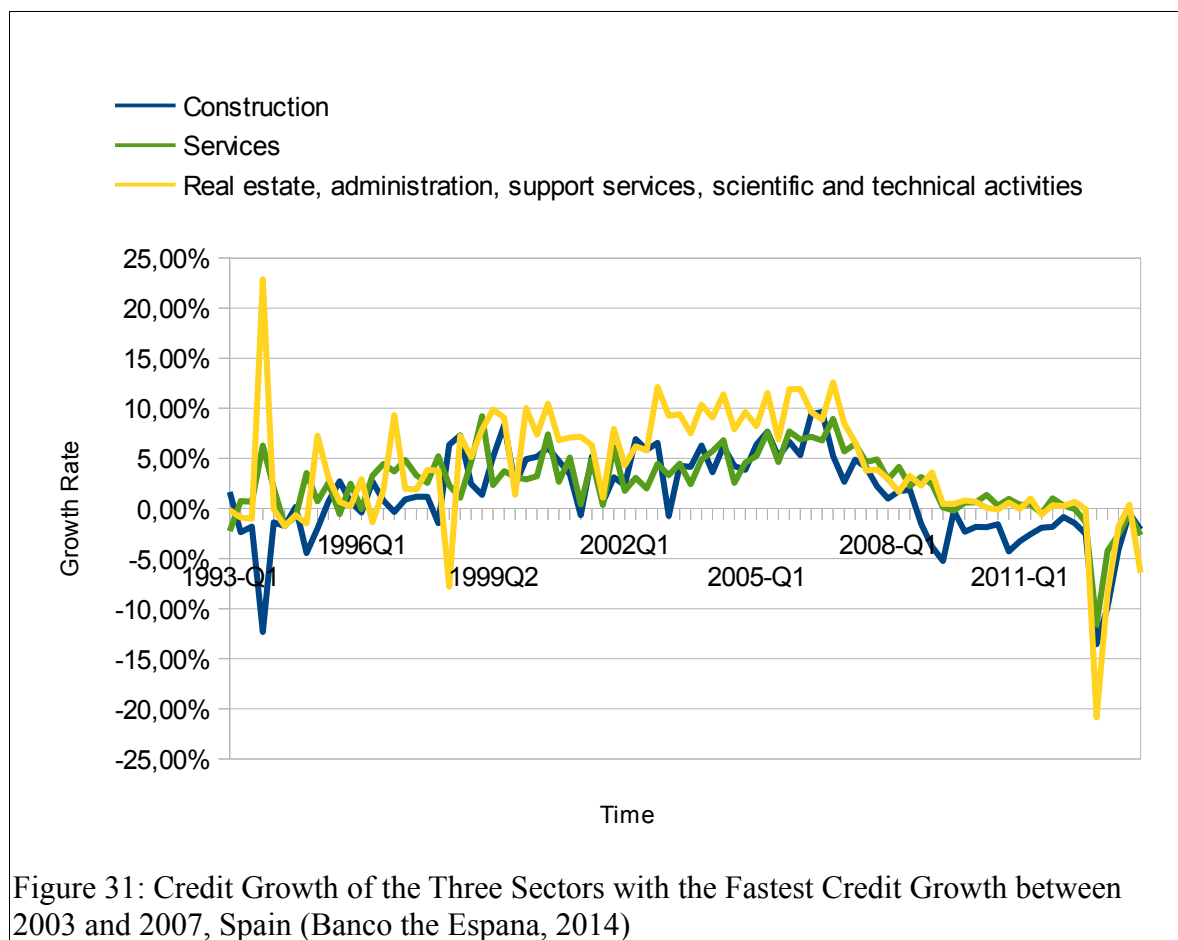


Figure 30: Gross Value Added in Percentage of Total by Sector, Euro Area (Eurostat, 2014e)

If possible, many banks will therefore continue to lend to traditional customers even though they may not be particularly profitable or under severe financial distress for a prolonged period of time. There is a risk that these companies turn into “zombie” firms, meaning that even as the rest of the economy starts to recover, they rely on continued credit support (BIS, 2012; Peek & Rosengreen, 2003). In recent years a discussion about zombie companies particularly in the periphery countries (Ireland, Spain, Portugal and Greece) and the UK has arisen and the CBs' monetary policy stance has been questioned in the process. Even key policy makers, have started to worry about the structural implications of accommodative monetary policy in the post-crisis environment:

“The idea is not the settled view of the BoE [Bank of England], but Sir Mervyn and other senior staff worry that with households, banks and companies surviving only because of low interest rates, the country might wake up in five years still with weak growth, high debts and huge economic problems.” (Giles, 2012)



The problem is best understood from an historical account: During the Japanese financial crisis in the early 1990s both banks and the government supported certain unproductive firms to prevent further liquidity shocks to the system and preserve employment (Caballero et al., 2008). A number of studies have shown that the existence of zombie firms has effects on the whole economy (Caballero et al., 2008; Peek and Rosengren, 2003). In Japan, zombie firms forced healthier firms out of the market, evidenced by the fact that the productivity of the firms exiting was often higher than that of the firms surviving. This, in turn, led to an expansion of the market share of unproductive companies and in some cases to an overall decline in average productivity in most zombie industries (Nishimura et al., 2005; Ahearne & Shinada; 2005). The problem in Japan was extremely persistent as almost none of the zombie firms ever went bankrupt, but rather succeeded in undergoing substantial restructuring in the early 2000s, a decade after the crisis (Fukuda & Nakamura, 2011). Japan is not the only example of a country where banks or governments stepped in to keep firms with financial difficulties alive at the cost of the productivity and innovative power of

their economies: There is a large literature on soft budget constraints and their implications for transition economies, such as Poland, the Czech Republic, Russia and China.⁹

Empirical Analysis

Credible empirical evidence on the account of zombie firms in Europe is scarce, given the difficulties in identifying zombies and the necessary level of restructuring (Stothard, 2013). One crude indicator for restructuring are insolvency rates. The latest Financial Stability Report suggests that restructuring has been most pronounced in those countries and sectors, which demonstrated the highest growth rates during boom times – especially the construction sector in boom countries like Ireland and Spain has been downsized considerably (ECB, 2014b). Insolvency rates can, however, give no indication of whether restructuring is sufficient and how lenders behave towards their borrowers. The SAFE data can provide some suggestive evidence on how banks react to the profitability of their borrowers: if firms which report worse performance are more likely to get a loan and to better conditions, this could be seen as banks giving preferential treatment to weak borrowers. Given the limitations of the SAFE data set “worse performance” can only be identified by a reported decrease in profits over the past 6 months. This is clearly not a perfect indicator, because it tells nothing about the size of the change or the level of profitability. Figure 32 shows that SMEs with decreased profits do not have a much higher percentage of loan applications than firms with unchanged or increased profits in either region. However, they do seem to be more likely to apply for loan overdrafts or credit lines. As one would expect, Figure 33 demonstrates that there is a significant negative correlation between a deterioration in performance and the success of the loan application. The results are qualitatively similar in all regions: firms with decreased profits have lower success rates and are more likely to not get the full amount they applied for. The differences between the two groups of firms are lowest in Germany and fairly pronounced in both the EA and Spain.

⁹ Consult, for example, Kornai et al. (2003) for an overview of the topic.

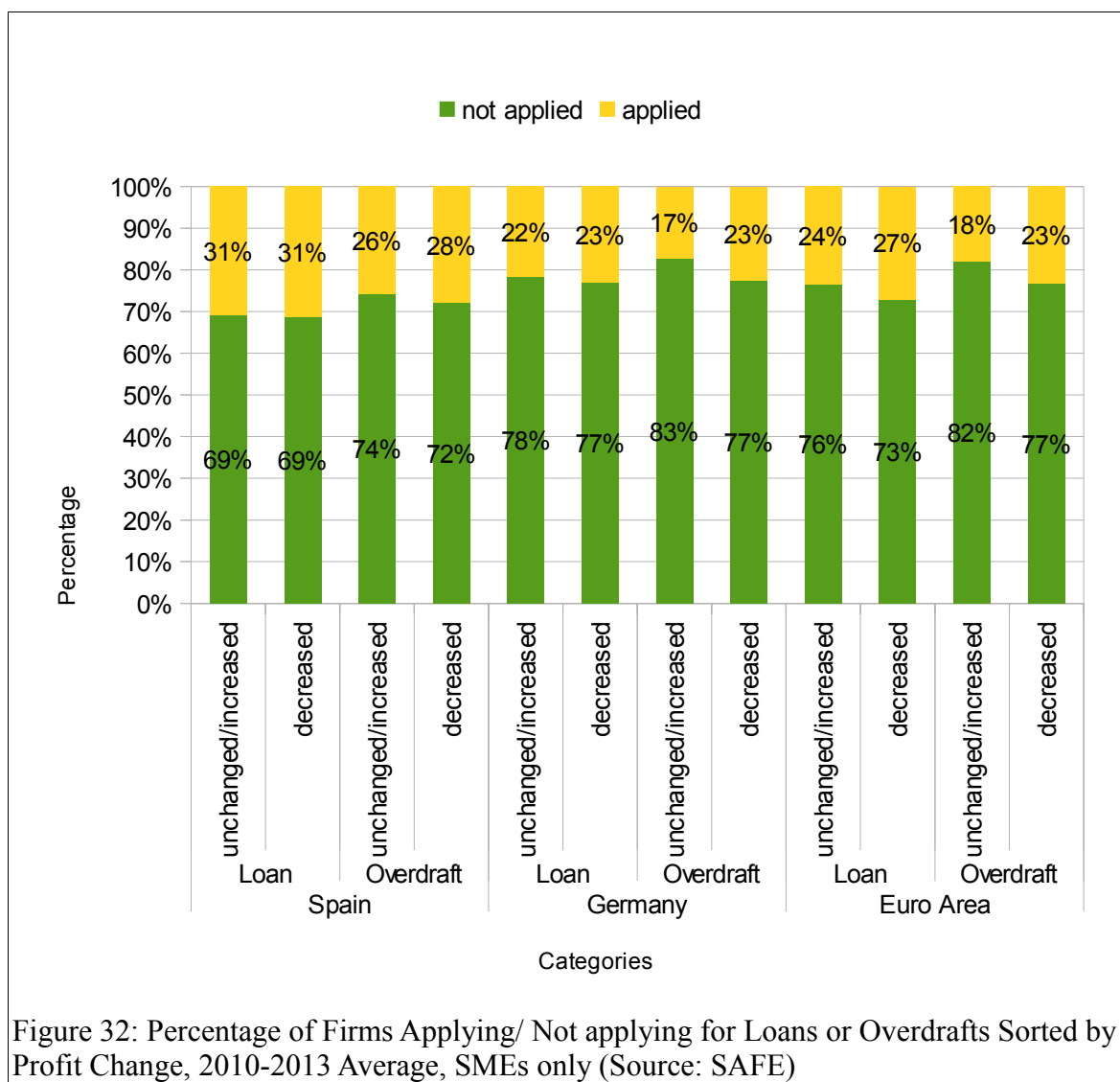


Figure 32: Percentage of Firms Applying/ Not applying for Loans or Overdrafts Sorted by Profit Change, 2010-2013 Average, SMEs only (Source: SAFE)

So far the data does not give rise to the suspicion that banks may be supporting worse performing firms. However, Figures 34 illustrate the development of the conditions of available bank financing to a company over the past six months. They show that decreasing profits are positively correlated with more decreases and less increases in interest rates. The results for required collateral and financial costs (other than interest rates) are qualitatively similar and the graphs are therefore not included. This is true for all regions, even though the differences are much lower for Germany than the EA and Spain. The interpretation of this result is controversial: It could either be supporting evidence for the idea that banks support struggling borrowers by giving the preferential conditions or it could show that the profitability measure is a bad indicator to measure firm performance. With the available dataset it is hard to make a final assessment.

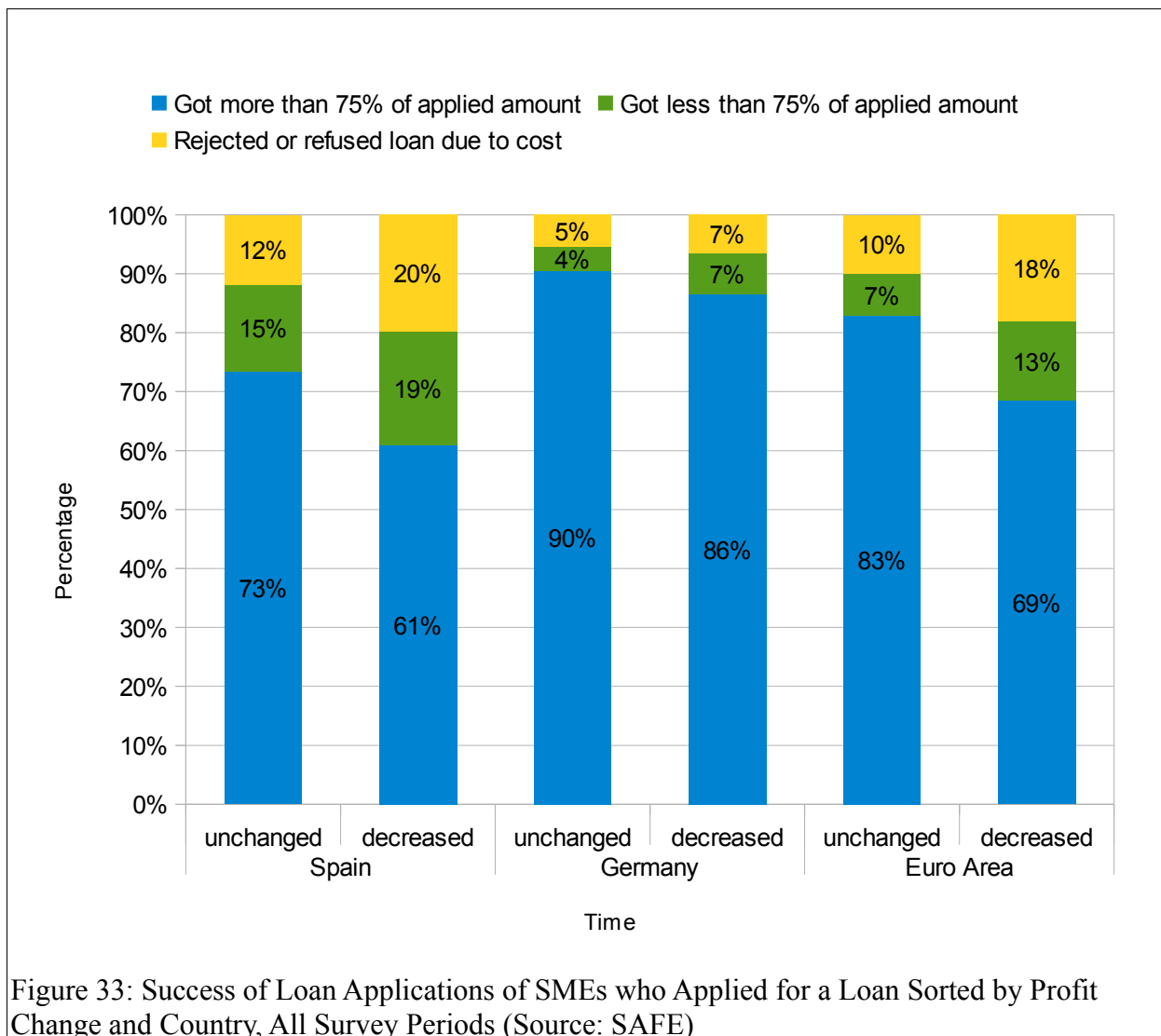
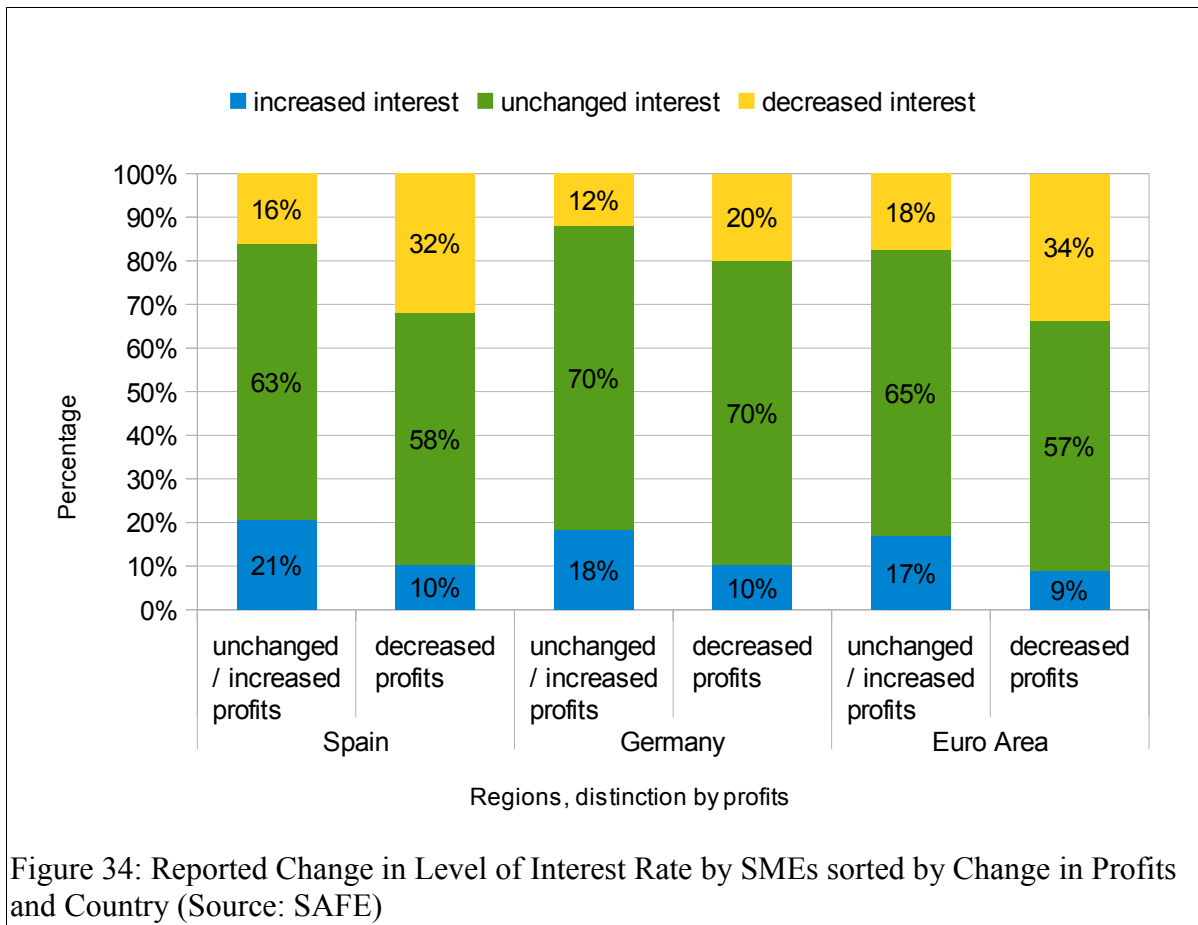
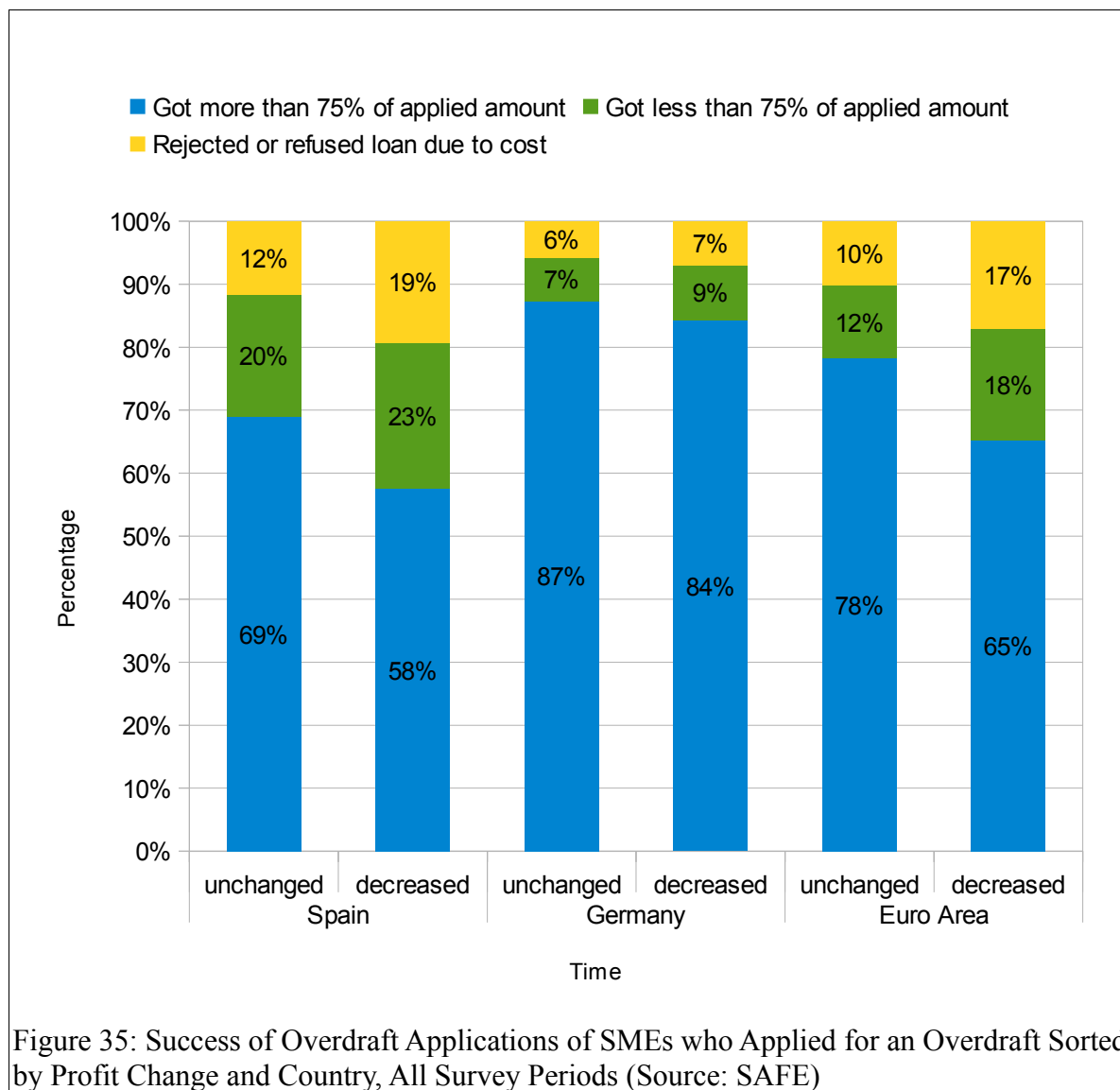


Figure 33: Success of Loan Applications of SMEs who Applied for a Loan Sorted by Profit Change and Country, All Survey Periods (Source: SAFE)

One study that works with a more detailed data set from a banking perspective is Albertazzi & Marchetti (2010). It analyses the behaviour of Italian banks with poor capitalisation after the collapse of Lehman Brothers and finds heterogeneous effects for banks of different sizes. Large banks exhibit a “flight to quality”, while the trend for small banks is reversed. In a test of some competing hypotheses regarding this result, the authors find that the result is most likely due to ever-greening practises by small banks, which are not aimed at restructuring otherwise profitably firms, but with avoiding losses to bank balance sheets. The study therefore supports the idea that there is a certain presence of zombie companies in Italy.





Within this debate it is necessary to be aware of the fact that raising interest rates is not the only solution to the problem of continued high indebtedness, vulnerability to financial shocks and systemic risk in the banking sector. So far economic recovery is slowly speeding up in many countries and may lead to a faster process of de-leveraging and restructuring: This theory is supported by the latest analysis in the Financial Stability Review (ECB, 2014b). Table 1 adds some supporting evidence from the SAFE dataset, showing that of all the firms whose profits increased in the same half year, on average 42-47% also de-leveraged, while of those with decreasing profits only 25-26% did. This suggests that firm profitability plays a large role in reducing leverage. This evidence is cause for mild optimism that as the economy recovers, the process of de-leveraging may speed up even if interest rates remain low.

Percentage of firms reporting decreasing debt-to-asset ratios			
	Spain	Germany	Euro Area
higher profit	47%	42%	47%
lower profit	26%	26%	25%

Table 1: Interaction between Profit and Leverage Ratios
(Source: SAFE)

Moreover, low interest rates encourage risk-taking *ceteris paribus*. However, since the financial crisis more effort has gone into lifting institutional constraints to restructuring and designing a macro-prudential framework that reduces systemic risk (Stothard, 2013; The Economist, 2013b). This section illustrates another dilemma faced by the ECB: On the one hand, raising interest rates could trigger disorderly restructuring and financial instability in the countries with highly indebted private and financial sectors; on the other hand, the lack of restructuring could lead to a slower recovery. The fact that this trade-off concerns only the periphery countries adds yet another dimension to the complex process of finding an adequate monetary policy for the EA.

4.3 The Risks of Further Monetary Expansions

4.3.1 The Zero-Lower Bound and Unconventional Policies

Further monetary expansions could clearly worsen the effects discussed in the previous section and lead to greater imbalances for those EA countries which are already confronted with loose monetary conditions. However, there is a more pressing problem associated with further monetary expansion: the ECB has exhausted its most conventional tool - the interest rates on its standing facilities and main refinancing operations - as interest rates are close to the zero-lower bound (ZLB). This implies that lowering long-term rates through the promise of continuously low short-term rates is the only interest rate policy at the disposal of the ECB. Section 4.2.1 has already illustrated potential problems with this approach. The ECB has relied on a number of “unconventional tools” during and after the crisis and needs to further rely on these measures as long as interest rates are at the ZLB.¹⁰ These policy tools are associated with considerable uncertainty regarding their long-term effects

¹⁰ For a discussion of unconventional tools and their workings the interested reader could consult Joyce et al. (2012) or Pattipeilohy et al. (2013).

and effectiveness. Unlike many of the effects discussed in this thesis the monetary transmission of unconventional policies is neither theoretically nor empirically well developed (Joyce, 2012).

A substantial body of research has now established that unconventional monetary policies did have the intended effects on inflation and output during the crisis¹¹, however, they may come at the costs of certain risks: threats to CB independence, distortions to asset prices and thus market signals and the mis-management of CB balance sheets (Kozicki et al., 2011). CB independence is closely linked to credibility. Given the prominent role of expectations for monetary policy, it is crucial that the public trusts the central bank to adhere to its mandate and announce its policies reliably and credibly (Mishkin, 2011). During the crisis, the ECB has had to support periphery governments through purchases of government bonds. Even though these purchases were sterilised, meaning that they did not affect the monetary base, they were a quasi-bail-out of these governments under financial distress. The ECB acted to preserve the EMU, but in doing so, it engaged in the fiscal domain, which could tarnish its credibility and has raised questions whether it is supporting unsustainable levels of government debt (Joyce et al., 2012). Even more seriously, the ECB has committed itself to further help if necessary. Not only could this damage the credibility of the CB it could also have future costs for the EMU: Bordo et al. (2013) find in a comparison of several currency unions that a no-bailout rule seems to be important to get the sub-units of a currency union to be fiscally prudent, which is a key requirement for the monetary union to function. Furthermore, by taking such measures the ECB has interfered with market prices with yet unknown consequences. The risk premia on government bonds of the crisis countries have recently been fairly low despite their slow recovery - Spanish, Italian, Irish and Portuguese 10-year-bonds were reporting yields between 2,7-3,5% while Greek bonds had a yield of 6,2% (8 May 2014). Figure 1 illustrates the drastic fall in long-term yields after the ECB stated that it would preserve the Euro at all costs (Wolf, 2014). Whether low prices reflect the true risk embodied in these bonds is questionable. Finally, contrary to conventional interest rate policy, unconventional monetary policy measures have a qualitative and quantitative effect on CB balance sheets. The former refers to an expansion of the balance sheet, while the latter refers to changes in the composition of the balance sheet and both can have an impact on the exposure of the CB to financial instability and sovereign debt crisis (Lenza et al., 2012). Hannoun (2012) reports that post-crisis, CB assets exceed 20% of

11 For a literature review see, for instance, Gambacorta et al. (2012).

GDP on average in advanced economies. The ECB's balance sheet in particular had an annual compounded growth rate of 8,7% between 2007 and Q2 2013, which is much lower than the growth rate for the UK (30,8%) or US (28,1%), but still substantial (Dobb et al., 2013). Concerning qualitative changes, the US, UK and Japan have largely focused on government securities (and credit market interventions in the US), while the ECB largely relied on an expansion and slight alteration of already existing and fairly well-understood monetary channels such as liquidity provision (Dobb et al., 2013, Pattipeilohy et al., 2013). The current (13 August 2014) outstanding amounts on the ECB balance sheet from its unconventional policy measures are small compared to the total exposure of other CBs. Joyce et al. (2012) suggest that the difference in policies was partially due to the fact that the ECB was addressing a different problem, namely the structural imbalances within the EMU. Other CBs were focused on decreasing yields on various assets to stimulate economic activity. At this point in time it is impossible to assess what the consequences the measures taken will have for the EMU and its member states. It is likely that due to the worse economic situation in the periphery the ZLB constraint will also be binding for a long time for the core countries.

5 Discussion and Conclusion

Chapter 3 has set out the theoretical framework for the analysis, discussing the establishment of the EMU, putting some emphasis on the question whether the EA really is a region suited for a common monetary policy. Many scholars have argued that the member states are in fact too heterogeneous and that relying on one monetary policy in the light of asymmetric shocks can actually worsen the imbalances within the EA. The empirical part of this thesis provides supporting evidence for the asymmetric developments in Germany and Spain and how they were tied to monetary policy. Given that the EMU still exists, this thesis has been devoted to analysing the choices the ECB faces in the presence of the currency union by comparing data from Germany and Spain.

The data shows that Germany is doing well compared to the EA on average and particularly Spain. The OECD growth and inflation forecasts predict an improvement in both growth and inflation, which has been below the 2% target. In addition, the credit market seems to be healthy, with micro-economic data indicating that firms do not face substantial problems in getting the bank finance

they need. Despite low interest rates, credit growth is oscillating around zero. Given that Germany did not suffer from structural imbalances such as strong growth in the non-tradable industries or property booms there is little need for a restructuring or de-leveraging of the economy. Data on housing markets shows a sustained, but gradual increase in residential property prices. Even though GDP growth and inflation are rather low, a simple Taylor rule assessment indicates that monetary policy may currently be too expansionary for Germany – the effects of which could manifest themselves in the mid-term. The situation for Spain is rather different: growth rates are slow, the inflation rate is close to zero, SMEs struggle to obtain finance, banks have a comparatively large amount of doubtful loans on their portfolios and property prices have been falling rapidly. Even though six years have passed since the peak of the financial crisis, there is very little improvement visible in the macroeconomic indicators for the Spanish economy. A Taylor-rule assessment suggests that monetary policy for Spain is approximately right, while the Taylor-type rule of Johansson & Ljungberg (2013) suggests that further easing would be necessary.

The ECB therefore faces a dilemma: Expansionary policy could raise the inflation rate in Germany above the 2% target and potentially widen the differential between Spanish and German inflation, improving the competitiveness of Spanish relative to German exports. In the current situation much of the adjustments in Spain have to take place via cutting costs, which is economically painful, particularly in an economy with already high unemployment rates. It is not entirely certain that further expansionary policies would help the Spanish credit market to recover, because much of the problem seems to be the low net-worth of borrowers and the fact that low policy rates are not being fully transmitted to other rates in the economy. This trend seems to have been improving lately. In any case, further monetary expansions would have to rely on unconventional policies, which may have some unintended long-run consequences for the EA as a whole. On the other hand, in the near future the need for a higher interest rate is most likely going to increase in Germany. A large literature has studied the potential negative effects of low interest rates on asset prices and credit cycles. While German data currently gives little reason to worry about these developments, they are certainly mid- and long-run concerns. What becomes evident when looking at the data is that tightening monetary policy in the current environment could have disastrous consequences for Spain, mainly because NFCs and financial intermediaries are extremely vulnerable to interest rate raises and a monetary tightening could therefore trigger further financial turmoil. It could also put a stop to the rather slow process of recovery that has been visible in the most recent data.

What the data shows without a doubt is that the required monetary policy in Germany and Spain was not identical either before or after the crisis. For the ECB balancing the needs of eighteen distinct countries is a rather tricky task. It seems fitting to say that task in the EA is not to find the optimal monetary policy, but the least worst. In the light of the risks discussed regarding the choices of the ECB in the current situation it, keeping interest rates close to the ZLB seems like a reasonable policy stance. Nonetheless, the discussion of the importance of the term spread, the disconnect between short- and long-term rates and the association of low rates and structural imbalances suggests that the promise that rates will remain low for a pro-longed period of time is potentially dangerous. Even though the ECB is currently balancing a number of risks, it should be noted that this does not necessarily imply that the EMU is doomed to failure. As pointed out before, there are four factors, which contribute to the OCA properties of a region: trade integration, the correlation of business cycles, the degree of labour mobility and the federal structures (Frankel & Rose, 1998). The question is whether the EU has the means to foster such an integration to an extent that would make the EA homogeneous enough for a single monetary policy. The absence of a fiscal union has, for example, often been cited as one of the main problems of currency areas such as the EA. Bordo et al. (2013) compare federal monetary unions such as the United States, Canada, Argentina, Brazil and Germany and conclude that many institutional structures have developed in response to crises. If the EA follows a similar trajectory as these countries, it is likely that that it will come out of the crisis with stronger centralist structures. Given the current turbulences in the EA and the strong separatist tendencies on a country and within-country level, it is questionable whether the EA possesses the necessary popular backing to create the federal structures to deal with imbalances in the union. The current outlook for the EMU and the effectiveness of monetary policy in Europe therefore does not encourage optimism.

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APPENDIX

#	Time period	Fieldwork period	Wave
1	2009H1	17 June 2009 and 23 July 2009	Common wave
2	2009H2	19 November and 18 December 2009	ECB wave
3	2010H1	27 August and 22 September 2010	ECB wave
4	2010H2	21 February and 25 March 2011	ECB wave
5	2011H1	22 August and 7 October 2011	Common wave
6	2011H2	29 February and 29 March 2012	ECB wave
7	2012H1	3 September and 11 October 2012	ECB wave
8	2012H2	18 February and 21 March 2013	ECB wave
9	2013H1	28 August and 4 October 2013	Common wave
10	2013H2	20 February and 24 March 2014	ECB wave

Table I. SAFE Survey Waves (Source: SAFE User Guide - Anonymized Microdata)

Wave	AT	BE	DE	ES	FI	FR	GR	IE	IT	NL	PT	EA
2009H1			302	308		300			303			3079
2009H2	203	202	1001	1004	100	1001	200	101	1004	252	252	5320
2010H1	200	203	1000	1000	100	1003	200	100	1000	256	250	5312
2010H2	500	517	1000	1000	500	1004	500	500	1000	502	509	7532
2011H1	502	500	1006	1001	500	1002	500	502	1001	500	502	8316
2011H2	500	503	1000	1000	500	1005	500	500	1000	500	503	7511
2012H1	506	500	1006	1001	500	1001	500	500	1000	500	500	7514
2012H2	500	500	1002	1003	500	1002	500	500	1003	500	500	7510
2013H1	501	500	1000	1001	501	1002	500	500	1000	500	500	8305
2013H2	500	507	1000	1000	502	1005	500	500	1001	504	501	7520

Table II. Number of interviews conducted with euro area firms, broken down by country (Source: SAFE User Guide - Anonymized Microdata)

Variable	Survey Question	Values
Survey Period	Survey Period	2010H1 – 2013H2
Country	Area	DE, ES, EA
Company Size	How many people does your company currently employ either full or part time in all its locations?	Micro (From 1 employee to 9 employees) Small (From 10 employees to 49 employees) Medium (From 50 employees to 249 employees) Large (250 employees or more)
SME Dummy	Is the company a SME?	1 – yes 0 – no
Industry	What is the main activity of your company?	Mining, Construction, Manufacturing (including Energy, Gas and Water), Wholesale and Retail Trade, Transport, Real Estate, Other Services
Constraining Factors	On a scale from 1-10, where 10 means it is extremely pressing and 1 means it is not at all pressing, how pressing are each of the following problems that your firm is facing?	Finding Customers, Competition, Access to Finance, Costs of production or labour, Availability of Skilled Staff or Experienced Managers, Regulation, Other
Interest Expenses	Please tell me whether net interest expenses (interest expenses minus interest income) have decreased, remained unchanged or increased over the past 6 months in your company?	1 increased 2 remained unchanged 3 decreased
Total Profits	Please tell me whether profits (net income after taxes) have decreased, remained unchanged or increased over the past 6 months in your company?	1 if the firms profit decreased 0 if the firms profit remained unchanged/ decreased
Loan Application		1 applied 2 did not apply because of possible rejection 3 did not apply because of sufficient internal funds 4 did not apply for other reason
Loan Application Dummy	Could you please indicate wheter you applied for a bank loan (new or renewal, excluding overdraft and credit lines) over the past 6 months [...]?	1 applied 0 did not apply
Loan Application		1 applied 2 did not apply because of possible rejection 3 did not apply because of sufficient internal funds 4 did not apply for other reason
Loan Application Dummy	Could you please indicate wheter you applied for a bank loan (new or renewal, excluding overdraft and credit lines) over the past 6 months [...]?	1 applied 0 did not apply
Level of Interest	Could you please indicate whether the level of interest was increased, remained unchanged or was decreased by your bank over the past 6 months?	1 increased 2 remained unchanged 3 decreased
Financial Cost (without interest)	Could you please indicate whether your financial cost was increased, remained unchanged or was decreased by your bank over the past 6 months?	1 increased 2 remained unchanged 3 decreased
Required Collateral	Could you please indicate whether the required collateral was increased, remained unchanged or was decreased by your bank over the past 6 months?	1 increased 2 remained unchanged 3 decreased

Table III. Variable Description

Correlation Matrix									
	size	sector	interest_e xp	Profit-fall	Loan- dem	Overdr- app	interest	collateral	fin_cost
size	1.00								
sector	-0.2126	1.00							
interest_exp	0.0864	-0.0101	1.00						
profit_fall	-0.0943	0.0537	-0.1635	1.00					
loan_dem	-0.0442	0.0280	0.1085	-0.0358	1.00				
overdr_app	-0.1757	0.0636	-0.1560	0.1553	-0.1743	1.00			
interest	-0.1126	0.0890	-0.1535	0.2124	-0.0878	0.3255	1.00		
collateral	-0.1124	0.0646	-0.1041	0.1528	-0.0397	0.1910	0.3844	1.00	
fin_cost	-0.1181	0.0624	-0.1221	0.2199	-0.0817	0.2422	0.5243	0.3877	1.00

Table IV. Correlation Matrix, SMEs, Euro Area, 2010-2013

Summary Statistics					
Variable	Observations	Mean	Std. Dev.	Min	Max
size	51939	1.925355	.7954538	1	3
sector	51939	2.734766	1.19802	1	4
interest_exp	47335	1.804162	.6754384	1	3
profit_fall	50986	.4705213	.4991351	0	1
loan_dem	51507	2.653775	1.07921	1	4
overdr_app	9982	1.938189	1.372759	1	5
interest	36605	2.120694	.6063711	1	3
collateral	12277	2.00505	.5190794	1	3
fin_cost	27849	2.104456	.5339365	1	3

Table V. Summary Statistics, SMEs, Euro Area, 2010-2013