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Are some EMU members more favoured by the ECB's interest rate decisions than others?

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Abstract

The ECB has the ultimate responsibility for the single monetary policy. The ECB's goal is maintaining price stability over the medium term; this means ensuring inflation stays in the region of 2 percent. If some EMU members are more favoured by the ECB's interest rate decisions then this would cause implicit problems and overall, the monetary union would face problems regarding structural divergences between member countries. These divergent problems would make each country differ from each other with regard to inflation and GDP growth. Thus the ECB has the difficult task of deciding a single interest rate that fits all member countries. Calculations based on interest rates versus forecasts on output gaps and inflation do illustrate a pattern that shows that some countries are more favoured by interest rate decisions than others. This poses a crucial question as to whether all countries benefit from membership in the monetary union and, by extrapolation, does the ECB as an institution have enough power to execute pivotal monetary politics?

Key words: ECB, EMU, Eurozone, interest rate, monetary policy, output gap, inflation.

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List of abbreviations

ECB	European Central Bank
EMU	European Monetary Union
EU	European Union
GDP	Gross Domestic Product
NCB	National Central Bank
MRO	Main Refinancing Operations

1. Introduction

The European Monetary Union (EMU) has been in operation for a decade. The union has been under heavy scrutiny, and some members of the European Union (EU) still have not ratified their obligations to become members in the EMU. One main reason these countries have given to not join the EMU is because monetary policy decisions are centralized at the European Central Bank (ECB). The ECB and its three decision-making bodies have the ultimate responsible for the single monetary policies and the joint interest rates. These interest rate decisions were intended to treat all member countries equally but the effects as to how well the decisions fit each EMU country are different. The Treaty on the European Union entrusts the monetary policy to the ECB and the institutional framework for the single monetary policy ensures that the central bank is independent from political influence.[1] However, there is significant evidence that the Governing Council of the ECB is, in fact, affected by national needs and desires, which, ultimately, could affect those interest rate decisions.[2] Economic theory and empirical data illustrates that the interest rate is highly correlated with economic development and inflation. In particular, interest rates and output gaps have co-varied over time for the Eurozone.[3] In order to see if some member states in the EMU are more favoured than others by the interest rate decisions taken by the ECB we will look at economic forecasts and key interest rates for the period from 2000 to 2009. If there are indications that some member countries are more favored by the interest rate policy then what would this imply for the EMU and the countries that are under the single monetary policy? The question is an important one to investigate because, if it is true that some states are more favoured, meaning some states are not favoured or does not fit the Eurozone monetary framework, then not only will these countries face problems, but, that in turn, means greater difficulties for the ECB. These difficulties include: a restricted ability to stabilize the member countries' economies, the ECB's reactions to boosts and recessions would be ineffective, inflationary differences may arise due to structural divergence problems within the union, and the EMU countries' relative competiveness could decline due to increasing costs and different real interest rates. Ultimately, all of these problems could induce countries to leave the monetary union.[4]

[1] The European Central Bank (2004), *The monetary policy of the ECB*, p.13.
[2] De Grauwe, *Economics of Monetary Union*, p. 184-186.
[3] De Grauwe, *The Eurozone: Problems and Prospects*, p. 10.
[4] IBID, p. 14, 17.

1.1 Problem formulation and study objectives

The question outlined in this bachelor's essay is formulated as follows, "Are some EMU members more favoured by the ECB's interest rate decisions than others?" The question is rather straightforward and simply asks whether the interest rate decisions made by the ECB favour some of the European Monetary Union's member states more than others, which might imply that the ECB looks at and form their interest rate decisions around certain member state's economic performances. The countries who are not favoured then suffer economically because significant problems and disadvantages arise. In order to be able to answer the question stated above we need to examine forecasts of economic performance, such as output gap and inflation growth, for all the EMU member states and compare these with interest rate decisions made by the ECB. An econometric analysis of the data is not included because individual analysis and calculation of the data is sufficient to establish any patterns.

1.2 Purpose

There are many reasons to choose to write a bachelor's essay within the macro field and with a special focus on the EMU, the ECB, and its interest rate decisions. First and foremost, macroeconomics and economic politics is crucial because such decisions affect all corners of society. The European Union and the ECB lies within this main focus because many countries in Europe, (even Sweden although not yet a member of the monetary union), are affected by the union's policy decisions. The complexity a single monetary union implies is interesting to unravel and the task to examine whether interest rate decisions favours some member states, is challenging. Also, the EU and the EMU is a broad and much explored research field with ample authorship. This essay attempts to both evaluate the main research concerning the EU and to draw conclusions as to whether countries benefit from the single monetary policy. This becomes an obvious problem if countries do not benefit equally by the monetary policies and that in turn could imply that policy changes are necessary to correct any inequalities. However, the main goal of this essay is not to negate the work of the ECB. The focus is only to investigate if some countries are in fact favoured by the interest rate decisions and what economic consequences this might cause. It should also be emphasized that much of the information that describes the work of the ECB is gathered from publications made by the ECB itself. This could be critiqued as the ECB may be biased in their description of their work, although, other writers and views are presented when it comes to defining the problems

within the ECB and the single monetary policy which shed light on whether ECB's work in fact is operating as stated or not.

1.2.1 Previous research

Other research in the same field suggests that the EMU and its single monetary policy is biased and does not favour all countries equally. Paul de Grauwe, and his writings in "*The Eurozone: Problems and prospects"* implies that the Eurozone has significant divergence problems and that the single monetary policy does not fit all. However, he has not investigated which countries that are favoured and how this has varied over time for the Eurozone as a whole. Moons and Van Poek have also examined whether the single monetary policy fits all countries equally well, and their research in "*Does one size fit all? A Taylor-rule based analysis of monetary policy for current and future EMU members"*, suggests that the ECB's policy does not fit individual EMU members equally well, and that addition of new member states will not change this. This thesis' focus on which countries benefit from the monetary policy; and the findings thus sheds light and contributes to a part of the research field that has not been much explored.

1.3 Delimitations

Some difficulties were encountered when writing this essay in finding appropriate data on economic performance for each member country, and for the Eurozone as a whole for the entire time period. In order to use appropriate data for forecasts on output gap and inflation, we are forced to exclude all interest rate decisions made in 1999 and interest rate decisions made 4 February and 7 March in 2000 due to a lack of available data on forecasts of output gaps for these dates. However this has no significant effect on the results and conclusions made in the analysis: there is enough substantial data on the other interest rate decisions made up until 13 May 2009. Another issue in assessing the data was how to handle interest rate decisions made by the ECB that resulted in no change or no new stance (and was not presented in the key interest rate table 1 on page 23). These were not included in the following calculations on interest rates, output gaps, and inflation, but nevertheless they have to be considered because no change in the interest rate remains a decision that ultimately affects the EMU member countries.

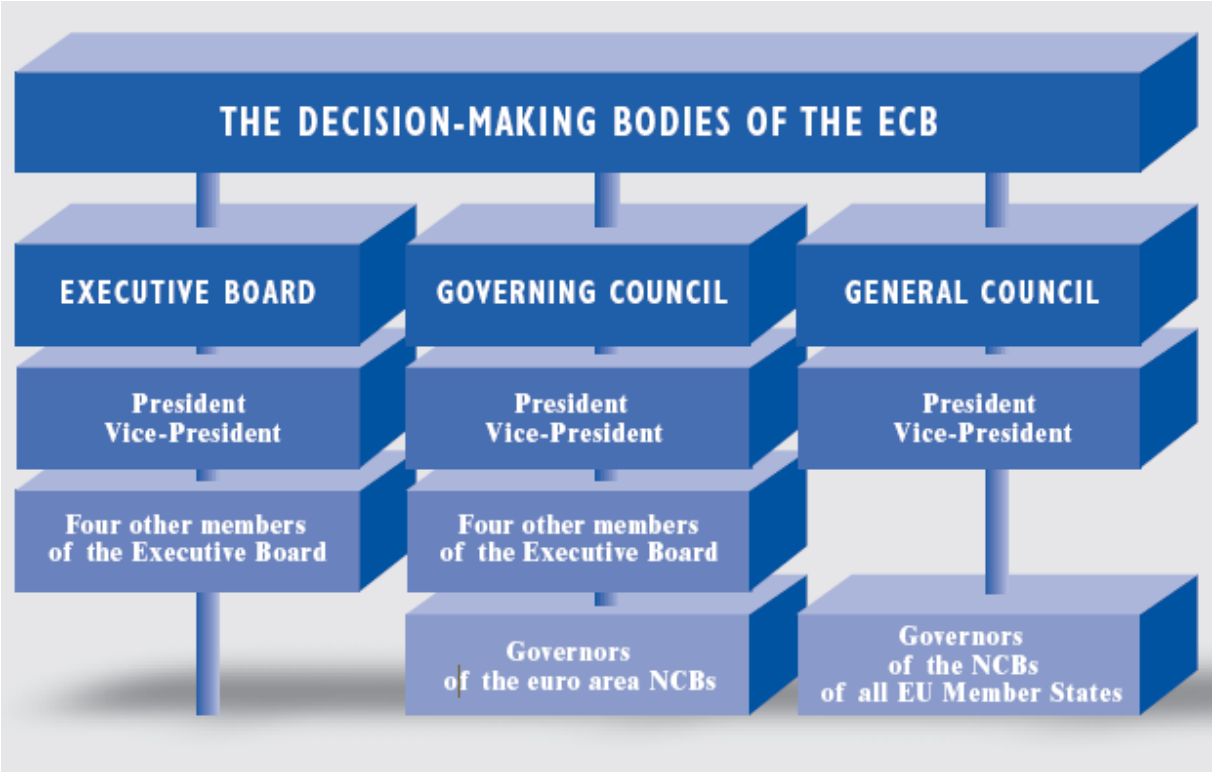
1.4 Outline

The essay is divided into three sections: an introduction to the ECB, a quantitative data analysis, (which includes a comparative analysis) and, a conclusion. The introduction to the ECB looks at the design and objectives of the ECB and its single monetary policy, and is important in order to understand the work of the ECB and any potential problems. The data analysis and calculations are presented in the quantitative section. The final section will try to answer the outlined problem.

2. Introduction to the ECB

The Treaty on the European Union was signed in Maastricht on the 7th February 1992. Among other things, it stipulates that monetary policy is entrusted to the Euro system.[5] The Euro system consists of the European Central Bank and the national central banks (NCBs) of all the countries who joined the EMU[6]. Today, there are 16 such NCBs. The ECB consists of two decision-making bodies: the Governing Council and the Executive Board. These two bodies are responsible for the preparation, conduct, and implementation of the single monetary policy. The General Council is the third decision-making body of the ECB. Figure 1 below illustrates the decision-making bodies of the ECB.

Figure 1. The decision-making body of the ECB[7]



The chart illustrates the three decision-making bodies of the ECB which all have different responsibilities. The Executive Board and the Governing Council are the main decision-making bodies of the ECB.

The Executive Board of the ECB consists of the President, Vice-President, and four other

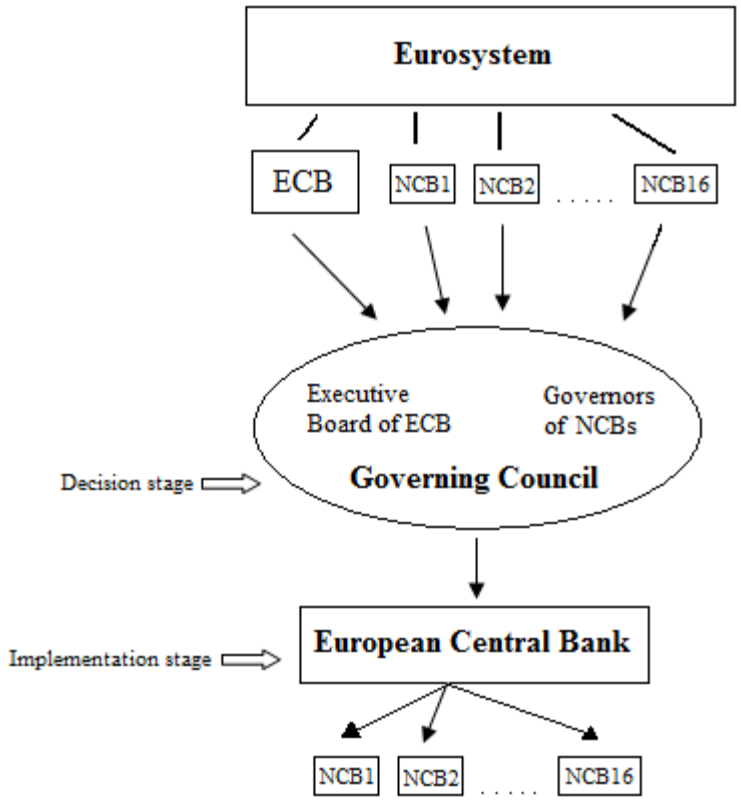
[5] The European Central Bank (2007), *How the euro became our money. A short history of the Euro banknotes and coins.*
[6] De Grauwe, *Economics of Monetary Union*, p. 181.
[7] The European Central Bank (2004), *The monetary policy of the ECB*, Chart 1.1, p. 10.

members. They are all selected by the head of state and governments of the Euro area countries and their main duties include: convening meetings of the Governing Council, implementing monetary policy, and overall responsibility for the current business of the ECB. The Governing Council of the ECB consists of the six members of the Executive Board and the sixteen governors of the member countries' NCBs. The responsibilities of the Governing Council are primarily to formulate the monetary policy of the Euro area and to adopt the guidelines entrusted to the Euro system. The last decision-making body of the ECB, the General Council, is composed of the President, Vice-President, and all the governors of the NCBs of the EU member states. This body will remain in existence as long as there are EU member states that have not joined the EMU. The General Council works to strengthen the coordination of monetary policies among the non-EMU member states, to collect statistical information, and to make the transition towards full EMU membership smoother.[8]

It has to be emphasised that the ECB is only a part of the entire Euro system, and it has no mandate to take decisions on its own, as the NCBs are also involved in decision-making.[9] Throughout this essay I will thus use 'ECB' as a synonym for the Euro system and the reader should note that the ECB then refers to a broader concept. The organizational framework of the Euro system and its decision-making structure can be seen in figure 2 on the following page. From this figure it is clear that the decision-making procedure has an integrity that involves the NCBs, the Governing Council of the ECB, and the ECB as a whole.

[8] The European Central Bank (2004), *The monetary policy of the ECB*, p. 11.
[9] De Grauwe, *Economics of Monetary Union*, p. 182.

Figure 2. Organizational framework of the Euro system[10]



The Euro system consists of the ECB and the 16 NCBs. The decision-making begins with all of the NCBs governors requesting a specific interest rate level, and the ECB requests an interest level for the Eurozone as a whole. The Governing Council of the ECB is responsible for setting the official interest rate. The ECB as a whole, with its three decisions-making bodies, and the NCBs, implement that monetary policy.

Figure 2 above illustrates that the decision-making is channelled through the ECB and the 16 NCBs who may want different interest rate levels. These requests are passed on to the Governing Council of the ECB who fixes what the interest should be. In turn, ECB's three decision-making bodies, together with the NCBs, implement the decision.[11]

Article 108 of the Treaty established a central bank independent from political influence and so an institutional framework for the single monetary policy. Theoretical analysis and substantial empirical evidence indicates that the independence of the central bank is pivotal in maintaining price stability. According to the Treaty, the ECB, and the NCBs are forbidden to seek or take instructions from any Community institution or government. The Community institutions and the governments of the member states are also restricted in their influence

[10] De Grauwe, *Economics of Monetary Union*, figure 7.10, p. 182.
[11] IBID, p. 182.

upon the decision-making of the ECB.[12] Below follows a brief description of the main tasks of the ECB: price stability and interest rate policy, open market operations, and the ECB's obligations toward member states. Finally, the problems within these areas will be outlined.

2.1 The ECB's price stability and interest rate policy

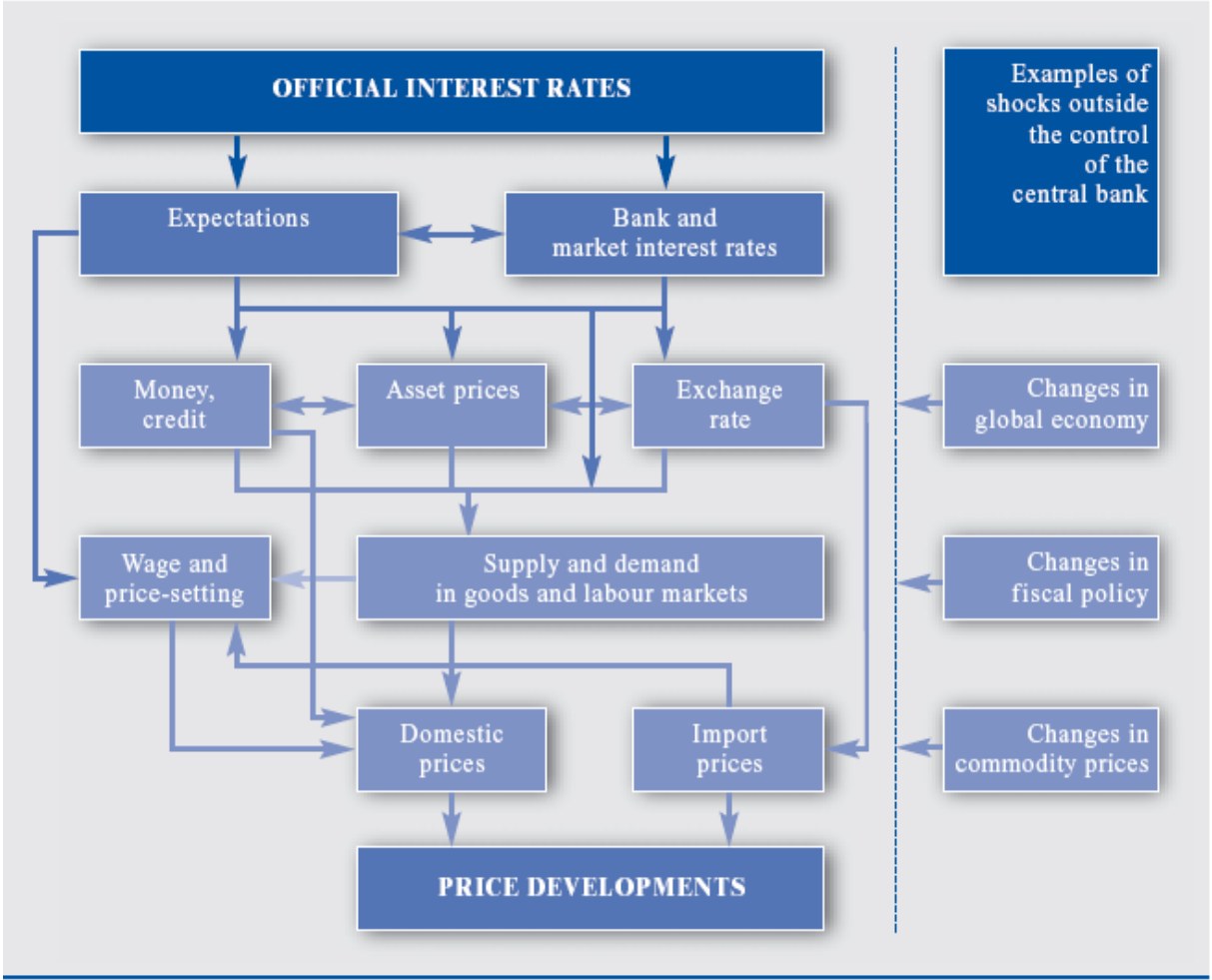
The Treaty defines the primary objective of the ECB and its single monetary policy as to maintain price stability. This goal, in combination with an ECB institution characterized by political independence, is called the *German model*.[13] Also, the ECB and the Euro system shall "support the general economic policies in the Community with a view to contributing to the achievement of the objectives of the Community"[14]. This means that a high level of employment and sustainable non-inflationary growth is to be guaranteed. However, these aspects are only assured if price stability is maintained. The Treaty's focus on price stability is legitimatized by the fact that macroeconomic theory and empirical evidence show that monetary policy cannot influence any real variables such as unemployment or GDP level in the long run. In the long run, monetary policy can ultimately only influence the price level, the so-called monetary neutrality. If this is right, then the only natural objective for the ECB is to assure price stability.[15] Because the ECB is an institution that priorities price stability over output and employment stabilization, the ECB may be called a 'conservative' central bank.[16] Whether the money neutrality theory is relevant for economic policies has been debated over the years. Researchers like Lucas and Lothian, agree that money neutrality is accurate in the long run but others like Hsing and Gupta find evidence that money does affect output in the long run and that the effect varies between countries.[17] This debate between different researchers' results raises serious doubt on the universality of the neutrality of money, and thus the ECB's claim to base their monetary policies on this theory might have implications.

The transmission mechanism through which the interest rates affect primarily prices (and also the economy as a whole) is important here. The channels of monetary policy transmission

[12] The European Central Bank (2004), *The monetary policy of the ECB*, p.13.
[13] De Grauwe, *Economics of Monetary Union*, p. 164.
[14] The European Central Bank (2004), *The monetary policy of the ECB*, p 10.
[15] IBID, p 43
[16] De Grauwe, *Economics of Monetary Union*, p. 168.
[17] Upadhyaya; Dhakal, Atlantic Economic Journal, *Neutrality of money and the Fisher hypothesis: Further empirical test*.

consist of multiple layers and begin with a change in the official interest rate level. Figure 3 on the following page illustrates the transmission mechanism from first impulse through to effects on the economy and the price level.[18]

Figure 3. Illustration of the transmission mechanism from interest rates to prices[19]



The official interest rates are set by the ECB. These influence people's expectations and behavior on the money-, finance-, and labor market. Bank and market interest rates are directly affected by the ECB's interest rates. These in turn affect the exchange rate, domestic prices, and consumer behavior. The transmission mechanism is very complex and this scheme illustrates why the ECB's only target is price stability.

The ECB holds the monopoly on issuing money, as agreed by the monetary union, and this ultimately affects the official interest rate. A change in money market interest rates affects other interest rates, primarily, those set by banks on short-term loans and deposits. In addition, expectations of future official interest rates influence long-term market interest rates and, in a further perspective, more indirectly government bond yields and long-term bank lending rates.

[18] The European Central Bank (2004), *The monetary policy of the ECB*, p. 44.
[19] IBID, Chart 3.1, p 45.

However, the long-term rates highly depend on expectations for long-term growth and inflationary trends in the economy. The monetary policy can also affect other financial variables, such as exchange rates and asset prices (e.g. stocks), which in turn affect the saving, spending, consumption, and investment decisions of firms and households. As a consequence of a change in consumption and investment the level of domestic demand for goods and services will change relative to domestic supply, which may lead to influencing both wage and price-setting in that particular market. The exchange rate will change due to changes in the interest rate level and influence the price level (and thus inflation) either through a movement of domestic prices or the lower the cost of inputs into the production process. The result is either a lower price for final goods or an effect on the competitiveness of domestically produced goods in the international market. Ultimately, control of the price level and the stabilization of the economy is complex and the ECB's focus in only trying to influence the price level seems reasonable when looking at the many entwined channels through which their open market operations go through.[20]

The Treaty's goal for the ECB to maintain and guarantee price stability, signalling a solid and sustainable economic growth and inflation trend over time, plays an important role. The ECB's aim is to maintain price stability ultimately means that they want to anchor inflation expectations. In 1998, the ECB stipulated that price stability "shall be defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP[21]) for the euro area of below 2 percent. Price stability is to be maintained over the medium term".[22] The reasons for the Governing Council of the ECB to publicly announce and quantify the exact target of price stability are clearly stated as being fourfold: firstly, to clarify how the Governing Council of the ECB interprets the goal and makes the monetary policy easier to understand, secondly, the definition provides a clear and measurable standard to which the public can hold the ECB responsible, thirdly, deviations from the 2 percent goal can more easily be identified and attended and finally, the 2 percent goal functions as a guidance to the public around which it can form its inflation expectations.[23]

The ECB's interest rate policy decisions in practice are simplified in the following fashion: when the ECB recognizes that the economy has a strong GDP growth, and that prices are

[20] The European Central Bank (2004), *The monetary policy of the ECB,* p. 45-48.
[21] Please advice Appendix A for more information on HICP.
[22] The European Central Bank (2004), *The monetary policy of the ECB,* p. 50.
[23] IBID, p. 52.

rising too fast, they want to increase the interest rate. They do this in order to make people consume less and to increase incentive to save money in banks, and as a result, reduce the money supply on the market so that prices are stabilized. Conversely, if the economy has to be stimulated the ECB lower the interest rate in order for GDP to grow more rapidly and prices to stabilize or increase.[24]

It has to be emphasised that the effects of an interest rate policy decision are only felt for a couple of years after the policy was implemented: empirical data and evidence show that an increase in the short-term interest rate results in a temporary decrease in GDP, which peaks about two years after the initial monetary policy impulse and then evens out to the original level, and prices gradually adjusts to a permanently lower level. However, it is uncertain as to how fast and how much prices respond to an increase in the interest rate. Evidence show that the lag period stretches from two to four years and those prices are not affected with the whole increase but more in the region of 30 to 40 percent.[25] This means that when the ECB has to make interest rate decisions they base their decisions on forecasts and prognoses on GDP and inflation in the future: an interest rate decision made by the ECB today has to be based on forecasts on GDP and inflation one to four years in the future, it has to be forward-looking.

2.1.1 Open market operations

The ECB controls the liquidity situation on the market and the interest rate indirectly through *open market operations*[26] that signal the stance of the monetary policy to the public. There are different kinds of open market operations, and which one is used depends on the aims and structure of the monetary policy in position. The ECB can use reverse transactions, outright transactions, issuance of debt certificates, foreign exchange swaps, and the collection of fixed-term deposits.[27] The most important instrument is the *reverse transactions* which have a weekly frequency and a maturity of normally one week. The reverse transactions are executed by the NCBs in the member states and are carried out through standard tenders.[28] Standard

[24] The European Central Bank (2004), *The monetary policy of the ECB*, p 45.
[25] IBID, p. 48-51.
[26] Appendix B contains a more detailed description of the ECB's open market operations.
[27] The European Central Bank (2004), *The monetary policy of the ECB*, p. 8.
[28] IBID, p. 16.

tenders imply that the time and fashion from the announcement of the tender to the settlement of the transaction is set to a maximum of 24 hours.[29]

2.2 The ECB's obligations towards member states

The ECB should not have any prior expectations on particular member states' economic performances. The ECB also recognizes that financial institutions and the harmonization of rules and procedures are to be treated equally throughout the Euro area, irrespective of where they are located. This criterion has to be guaranteed in order to provide identical conditions for all institutions in the monetary union.[30] Because the EMU is a monetary union the area will experience divergence problems. Divergence could exist in any market, such as labor and financial, and in order to deal with these problems the ECB claims that their monetary policy should "aim to achieve over the medium-term an inflation rate for the area as a whole that is high enough to prevent regions with structurally lower inflation rates from having to meet the costs of possible downward nominal rigidities or entering periods of protracted deflation"[31]. Again, this ultimately means that the ECB should aim at 2 percent inflation rate and price stability over the medium term for the union as a whole.[32] The ECB has not outlined any further specific obligations towards the monetary union's members.

2.2.1 Interest rate desires and decisions

When deciding the interest rate for the Eurozone the procedure is initiated by the national governors, who desire certain interest rates given the economic conditions prevailing in their own countries. Firstly, the governors of the Governing Council of the ECB should not take note of their own national economic conditions and should only be concerned about the Eurozone as a whole. Secondly, the ECB Executive Board desires an interest rate based on Eurozone aggregates and the wishes of the country, which means that the ECB's desired interest rate will be an average of the economic performance for the Eurozone as a whole and an average of the wishes of each member country. When calculating this interest rate the ECB

[29] The European Central Bank (2004), *The monetary policy of the ECB*, p. 24.
[30] The European Central Bank (2008), *The implementation of monetary policy in the euro area: General Documentation on Euro system monetary policy instruments and procedures*, p. 73
[31] The European Central Bank (2004), *The monetary policy of the ECB*, p. 55
[32] IBID, p. 54-55

Executive Board is very much influenced by the large countries: for example, when calculating the aggregate interest rate, the ECB has to take relative size into account which favors large countries such as Germany, Spain and France.[33]

Problems within the main tasks of the ECB, outlined on the previous pages, will be identified and evaluated in the following section.

2.3 The ECB and potential problems

The EMU is a currency area and according to the theory on "optimal currency areas", there will always be divergences and asymmetries in business cycles between countries. These differences don't have to imply problems if they are transitory; however, countries will suffer from these differences if they are structural, and if those monetary policies that are meant to stabilize does not work.[34] Structural differences do exist between EMU member countries and consequently many problems within the main pillars of the ECB will arise.

The transmission mechanism is complex (as seen in figure 3) and the ECB has no ability to affect and correct all markets within an economy in the long run as an interest rate decision can ultimately only influence the price stability. Even so, the economy and its agent will change and adjust to an interest rate decision in the short and medium run. Since structural divergences exist between EMU member countries, their markets will be differently affected by changes in the interest rates. For example, if Italy has high unemployment and structural problems with wages and employment, and Greece does not, the two countries will be affected differently. This also applies to the financial market where stocks, other interest rates, and domestic production have different prerequisites. The structural differences between countries compel the ECB to carry out its monetary policies with precaution since it is clearly problematical to fully grasp what effects might arise within different countries.

Forecasts are problematic since it is difficult to estimate changes in productivity, consumer behavior, market forces, output gaps, inflation, and other factors that influence GDP growth. If the prognoses are in fact wrong and if the interest rate decisions are based on these forecasts, the outcome will be incorrect. If the interest rates are misguided, this could affect the EMU members negatively, and have effects on the economies that are hard to correct. The

[33] De Grauwe, *Economics of Monetary Union*, p. 184-186.
[34] De Grauwe, *The Eurozone: Problems and Prospects*, p. 9, 12.

ECB is considered a conservative central bank that is careful when trying to adjust the economy. Even if this is true, the ECB has, especially during certain years, changed and corrected the interest rate level several times within short intervals. Is this a sign of that the ECB corrects the interest rate levels due to new information on forecasts (implying that the former decisions were misguided), or is the ECB just careful when changing the interest rates and acts out its monetary policy gradually? The answer here is not obvious, but we can see that relying on economic forecasts is highly volatile.

Inflation differentials across regions in the union are normal features of a monetary union and they are an integral part of the adjustment mechanism that results from divergence in economic development across the union's countries. Inflation differentials may be due to transitory or structural factors. If the differences are transitory they are of little economic concern and only temporary. If they arise because of structural differences across countries, such as differences in income levels and standards and unemployment preferences, this might create economic problems. These inflation differentials could cause the paralysis of the ECB or at least make the bank's work substantially harder. Inflation differentials between the union's members also affect the real interest rate. When discussing interest rates throughout this essay, the nominal interest rates (r) have been the main focus. However, the real interest rate, R, (nominal interest rate – inflation: r-i) is more informative when comparing different countries.[35] As can be seen in the data in appendix C, the Eurozone countries have experienced different levels of inflation over time. However, they are all obliged to operate under the same nominal interest rate level, which ultimately means that the real interest rates will be different across countries. Figure 4 on the following page illustrates different real interest rates averages for the older member countries (before 2005) from 1997 to 2004.

[35] Fregert, Klas; Jonung, Lars, *Makroekonomi Teori, politik & institutioner*, p. 97.

Figure 4. Average real interest rates in Eurozone countries (1997-2004)[36]

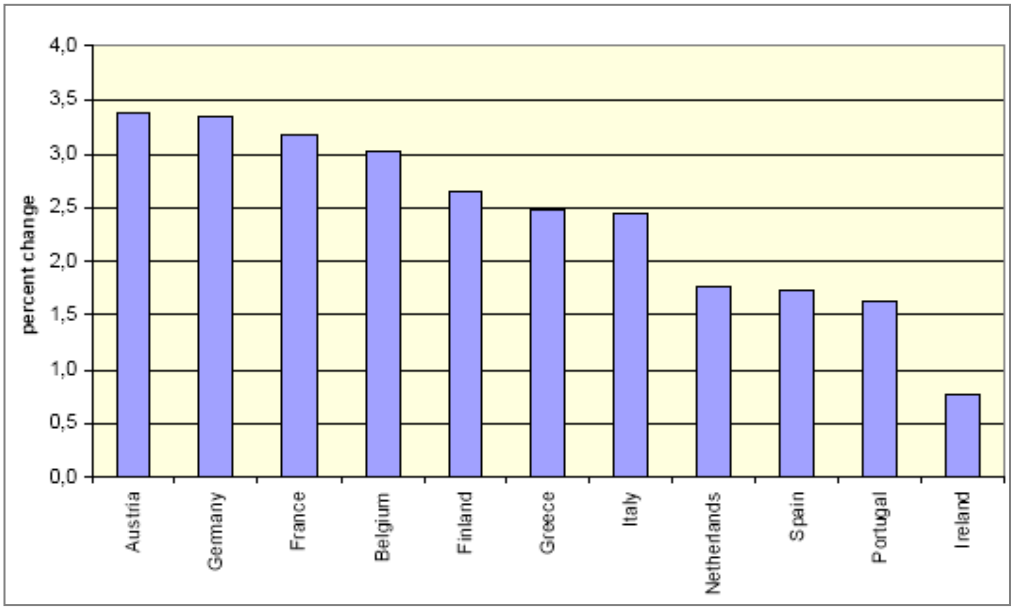


Figure 4 on the previous page, illustrates the fact that the *real interest rates differ* between the EMU countries. The countries that have experienced high inflation, like Ireland, will have a systematically lower real interest rate; and the countries with stable and low inflation, like Austria and Germany, will experience higher real interest rates. These differences will affect both the credit market and primary loans for the housing market differently in each country. As Paul De Grauwe also points out, this will lead to problematic spillover effects primarily in the housing market.[37] These divergent real interest rates are another aspect as to how structural differences create problems for the ECB and the EMU member countries.

According to the Treaty on the European Union, as outlined before, the ECB and the NCBs are forbidden to seek or take instructions from any Community institution or any government. The Community institutions and the governments of the member states are also restricted in how much influence they may exert upon the decision-making of the ECB: however, there is evidence, presented by Heinemann and Hüfner (2002), indicating that this is unlikely and that *national interest in fact plays an important role in the decision-making*; the differences in desired interest rates between countries and the bias that the ECB calculates the shared interest rate with regard to country size, illustrate that many member states are likely to be unsatisfied with the interest rate decisions of the ECB.[38]

[36] Fregert, Klas; Jonung, Lars, *Makroekonomi Teori, politik & institutioner*, p 13.
[37] De Grauwe, *The Eurozone: Problems and Prospects*, p 12.
[38] IBID, p. 200.

All the problems described above combine to make the problem formulation outlined in this essay an important one to answer and investigate. If some member states are more favoured than others, then this means that the countries that do not fit the EMU framework will face problems. In addition to the problems described above, the stabilization of the economy and reactions to boosts and recessions become problematic. Inflationary differences as well as asymmetric shocks hit countries differently and these illustrate the ECB's inflexibility to adjust these properly. Further, countries' relative competiveness could decline due to increasing costs and different real interest rates. All these problems could cause a paralysis of the ECB as no monetary policy is effective for all countries.[39] Whether some members are in fact more favoured by the ECB's interest rate decisions will be investigated and presented in the following data analysis and comparison section.

3. Data analysis and comparison

The following section describes how the analysis was executed, as well as presenting the motivation to the method of analysis and depicting a selection of data which will contribute to answer the question as to whether some EMU members are more favoured by the ECB's interest rate decisions than others.

As we compare and draw conclusions based on the forecasts made by the European Commission the interest rate decisions made by the ECB has to be analysed on the basis of the forecast that were available and applicable at that specific time. For example, the interest rate decision made on 28 April 2000 is analysed with data and forecast on output gap and inflation from the European Commission that was presented in Spring 2000; and the interest rate decision made on 13 May 2009 which uses the forecast made in Spring 2009 to predict future economic development. It should be noted that some forecasts have been used more than once in order to analyze the ECB's interest rate decisions. At times this was required because the ECB's interest rate decisions were more frequent than updates of the European Commission's forecasts. Why the ECB corrected their initial interest rate decisions more often than simply doing so when a new forecast was presented is unclear. Either they altered their view on the forecasts and thus revised the interest rate level or these updates illustrate the conservative manner of the ECB's monetary policy. However, any discrepancy between

[39] De Grauwe, *The Eurozone: Problems and Prospects*, p. 14, 17.

interest rate decisions and updated forecasts should not affect the results presented in this essay. The results are not affected in a biased way because all countries are systematically treated the same way and will be affected accordingly.

3.1 Interest rate decisions

When comparing interest rate decisions and the forecasts on output and inflation, it is important not to over-analyse the projected deviations from potential GDP or projected inflation. Data shows that some Eurozone-countries have experienced constantly higher inflation over time than other Eurozone-countries. This does not have to be a negative thing as long as the high inflation countries also have a higher productivity growth.[40] In fact the higher inflation in the high productivity growth countries is an equilibrating mechanism. This means that if productivity grows faster in one country than in another, this causes wages and the price of non-tradable goods to increase faster in order to keep the competitive position of both countries' tradable goods sector unchanged, the so-called Balassa-Samuelson effect.[41] However, this does not have to be applicable for all the Eurozone-countries in the analysis and comment on this phenomenon will be presented when relevant.

A table is presented on the following page with the key interest rates from 2000 to 2009. "Level" indicates the nominal interest rate level for the Eurozone and "change" indicates the percentage change from former interest rate level that each policy decision implied. The Governing Council of the ECB meets twice a month and assesses the economic situation and the stance of the monetary policy at its first meeting. If there is a monetary policy change, i.e. a change in the key interest rates, the Governing Council holds a press conference to publicly announce this.[42] It should be noted that the ECB Executive Board meetings, which resulted in no change or new stance of the interest rate, is not presented in the table. However their significance will be discussed in the conclusion.

[40] De Grauwe, *Economics of Monetary Union*, p. 200.
[41] De Grauwe, *Economics of Monetary Union*, p. 46.
[42] http://www.ecb.int/ecb/orga/decisions/govc/html/index.en.html, 2009-10-11

Table 1 [43]
Key interest rate data

Year	Date	Level	Change +/-
2000	28-Apr	3.75	0.25
	09-Jun	4.25	0.5
	28-Jun	4.25	0
	01-Sep	4.50	0.25
	06-Oct	4.75	0.25
2001	11-May	4.50	-0.25
	31-Aug	4.25	-0.25
	18-Sep	3.75	-0.5
	09-Nov	3.25	-0.5
2002	06-Dec	2.75	-0.5
2003	07-Mar	2.50	-0.25
	06-Jun	2.00	-0.5
2005	06-Dec	2.25	0.25
2006	08-Mar	2.50	0.25
	15-Jun	2.75	0.25
	09-Aug	3.00	0.25
	11-Oct	3.25	0.25
	13-Dec	3.50	0.25
2007	14-Mar	3.75	0.25
	13-Jun	4.00	0.25
2008	09-Jul	4.25	0.25
	8-Oct(1)	-	-
	9-Oct	-	-
	15-Oct	3.75	0.5
	12-Nov	3.25	-0.5
	10-Dec	2.50	-0.75
2009	21-Jan	2.00	-0.5
	11-Mar	1.50	-0.5
	08-Apr	1.25	-0.25
	13-May	1	-0.25

(1) On 8 October 2008 the ECB announced that, starting from the operation on 15 October, the weekly main refinancing operations would be carried out through a fixed rate tender instead of variable rate tenders

Ultimately each percentage change of the interest rate in the table above is compared with the forecasts from the European Commission on output gap and inflation, and all this raw data is

[43] http://www.ecb.int/stats/monetary/rates/html/index.en.html, 2009-10-15

presented in appendix C. One can see from table 1 that in 2004 there were no interest rate decisions, and comment on this and the potential implications will also be outlined in the conclusion.

3.2 Forecasts on output gap and inflation

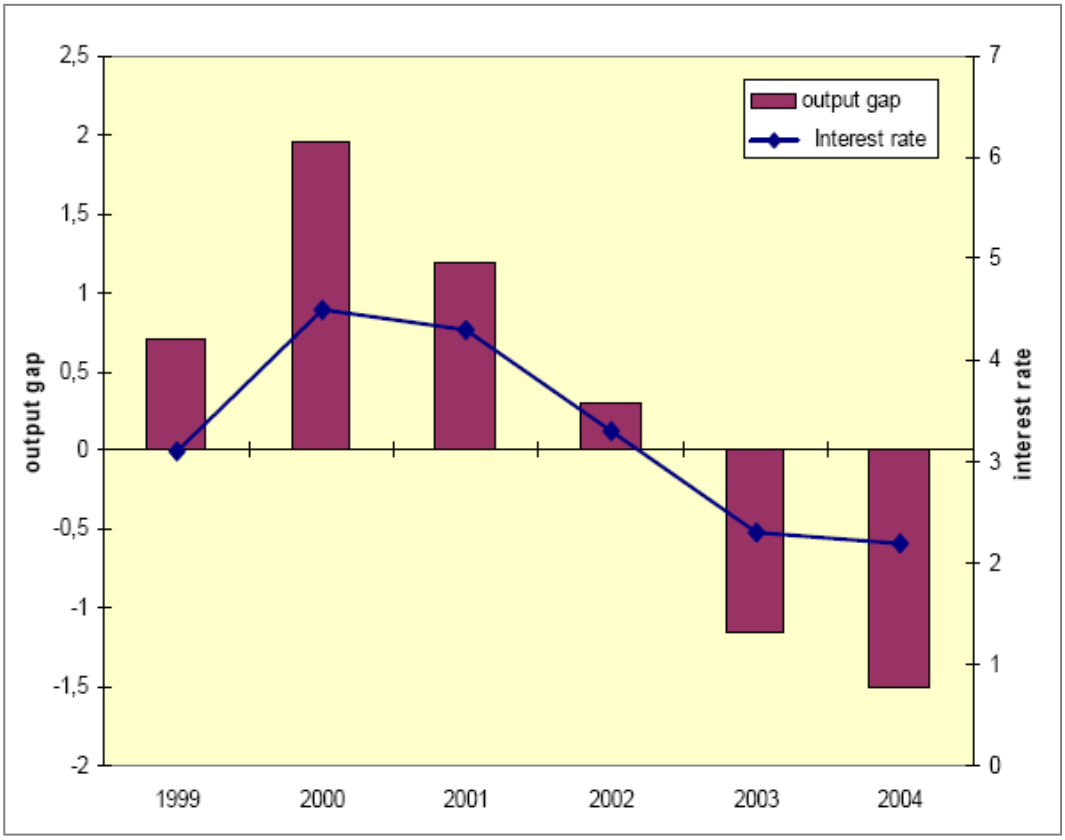
As the ECB's interest rate decisions are forward looking they have to be based on economic forecasts of one to four years into the future. In order to make an investigation as to whether interest rate policy decisions favour some countries more than others (based primarily on specific member countries' economic data) economic forecasts made by the European Commission stretching back to spring 2000 were analyzed. In particular forecasts for output gap relative to potential GDP growth and forecasts on inflation which are measured in HICP (see appendix A for description) were analyzed. We will only look at these two indicators as interest rate decisions are highly based on the expected development of GDP growth and inflation. The ECB also includes other factors in their profound analysis of the economy when deciding the interest rate level; but, significantly, the output gap relative to potential GDP and inflation is the key indicator; evidence shows that even though the ECB's only official goal is to ensure price stability, which is to keep inflation at about 2 percent, interest rates are also highly correlated and affected by output gaps: output gap movements have good predictive power of future inflation and thus the ECB will systematically react to output gap movements as well as inflation.[44]

Output gap and potential GDP growth are fundamental in assessing the cyclical position of an economy and they are essential components of the Stability and Growth Pact's surveillance process. Potential growth is a summary indicator of the economy's ability to generate sustainable, non-inflationary, growth and the output gap is an indication of the degree of deviation from this potential stabilized growth path. These economic indicators are difficult to calculate and forecasts on output gaps have to be interpreted with care. However, the output gap relative to potential GDP growth provides good indication as to what the appropriate mix of macroeconomic and structural policies should be taken in order to eliminate cyclical slack or raise the output potential of the economy.[45] There is empirical evidence that the output gap

[44] De Grauwe, *Economics of Monetary Union*, p. 173.
[45] http://ec.europa.eu/economy_finance/publications/specpub_list12526.htm, Economic Forecast Spring 2009, p. 37.

and the interest rate vary together, i.e. if the output gap is positive the interest rate will be higher and vice versa[46,47]. Below, figure 5 illustrates how the interest rate has co-varied with the output gap development over time for the aggregate Eurozone.

Figure 5. Short-term interest rate and output gap in the Eurozone (1999-2004)[48]



This figure clearly shows that when the output gap is positive the interest rate will be higher, and when the output gap is negative the interest rate will be lower. The evidence that the interest rate has followed the output gap over time, and therefore a pivotal indicator of how the ECB should set its interest rate level, will make us base our analysis from this point of view. The following section will outline the calculations and method used in assessing the data on interest rates and forecasts.

3.3 Calculations and method

In order to break down and compare the data on output gap, inflation, and interest rates a calculation of how the interest rate decisions (in table 1) fitted with each country's economic

[46] De Grauwe, *Economics of Monetary Union*, p. 174
[47] De Grauwe, *The Eurozone: Problems and Prospects*, p. 10.
[48] IBID, Figure 10, p. 10.

performance with regard to the output gaps and inflation was taken. The idea behind the calculations is to see whether the interest rates were better suited to some countries' economic performance than others. The results are presented both in relative numbers and percent, as countries have different denominators. A presentation in percent makes it possible to rank the countries and thus get an overview on which countries performed best and worst.

3.3.1 Calculations on interest rates: output gaps, and inflation

In order to present any data and figures that illustrate the connections between interest rates and output gaps and inflation three different calculations were conducted that will be presented below. Three other calculations that are based on the former will also be presented later on.

1) The first calculation explains the relationship between interest rates and output gaps. The method was to follow the idea that when the output gap is positive the interest rates should be adjusted upwards, and when the output gap is negative the interest rates should be lowered. We assume that when the output gap is zero the interest rate level should not change because the economy is performing exactly according to the stabilized growth path. For all the "older" EMU member states this means looking at 28 interest rate decisions made by the ECB and individually compare these with the forecasted output gaps for each country. For the new member states Cyprus, Malta, Slovakia, and Slovenia, this means looking at 16 interest rate decisions made by the ECB and in the same manner, and individually comparing these with the forecasted output gaps for these countries.[49] Each country is evaluated on a scale from zero to 100 percent, where 100 percent means that all the interest rate decisions were the right decisions with regard to the output gap situation and zero percent means that none of the interest rate decisions where right with regard to the forecasted output gaps. The results from the calculation on 'interest rate versus output gaps' are presented in figure 6 and table 2 at page 28.

2) When calculating and processing the data on interest rates versus inflation one has to bear in mind the price stability goal that the ECB primarily looked at when deciding and setting the interest rate. Price stability means that the inflation should be around 2 percent for the medium run. For this calculation we have assumed that this means that the inflation can vary

[49] Note that each interest rate change for the old countries is 3.6 percent since we have 28 observations (100/28) and 6.5 percent (100/16) for the new countries where we have 16 observations. It is important not just to look at the percent, but also the relative numbers in order to get a just image of the results.

around 2 percent with +- 0.2 percent and still be regarded as stable.[50] This implies an interval where levels of inflation at 2.3 percent or higher should be adjusted with a higher interest rate in order to decrease the inflation. Levels of inflation at 1.7 percent or lower should be corrected with a lower interest rate level in order to stimulate the economy and thus increase the inflation. An inflation rate that lies within the interval of 1.8-2.2 percent means that no change of the interest rate should be carried out. As outlined before, there are cases in some countries when the inflation is consistently higher than 2.2 percent. This does not have to be seen as an anomaly and can be explained by the equilibrating Balassa-Samuelson effect when productivity growth is simultaneously higher. However, to avoid any further subjective analysis and calculation than the estimated intervals already imply, let us assume that any inflation level at 2.3 percent or higher should imply a higher interest rate, without regard to a possible Balassa-Samuelson effect. In order to see if the changes in interest rate levels were the right decisions for each country's forecasted inflation situation, let us proceed in the same manner as for the "interest rates versus output gap" calculation. For the older member states 28 interest rate decisions are considered and for the new member states only 16, and these are compared with each country's forecasted inflation situation. Again 100 percent conformity means that all the interest rate decisions were the appropriate decisions with regard to the inflation situation and zero percent means that none of the interest rate decisions were right. Figure 7 and table 2 on the following pages illustrates the outcome of the calculations.

[50] This interval is subjectively created in order to avoid a too narrow calculation. To only consider exactly 2 percent as a stable inflation growth is too specific and the interval of 1.8-2.2 percent means that any country's inflation can vary within this interval without being regarded as unstable. One could imagine other intervals, and it has to be emphasized that other intervals would change the result presented in table 2 and figure 7. If we would include all the times the ECB had a monetary meeting but decided not change the interest rate level, we also would have ended up with a different result.

Figure 6. Conformity between interest rate decisions and output gaps

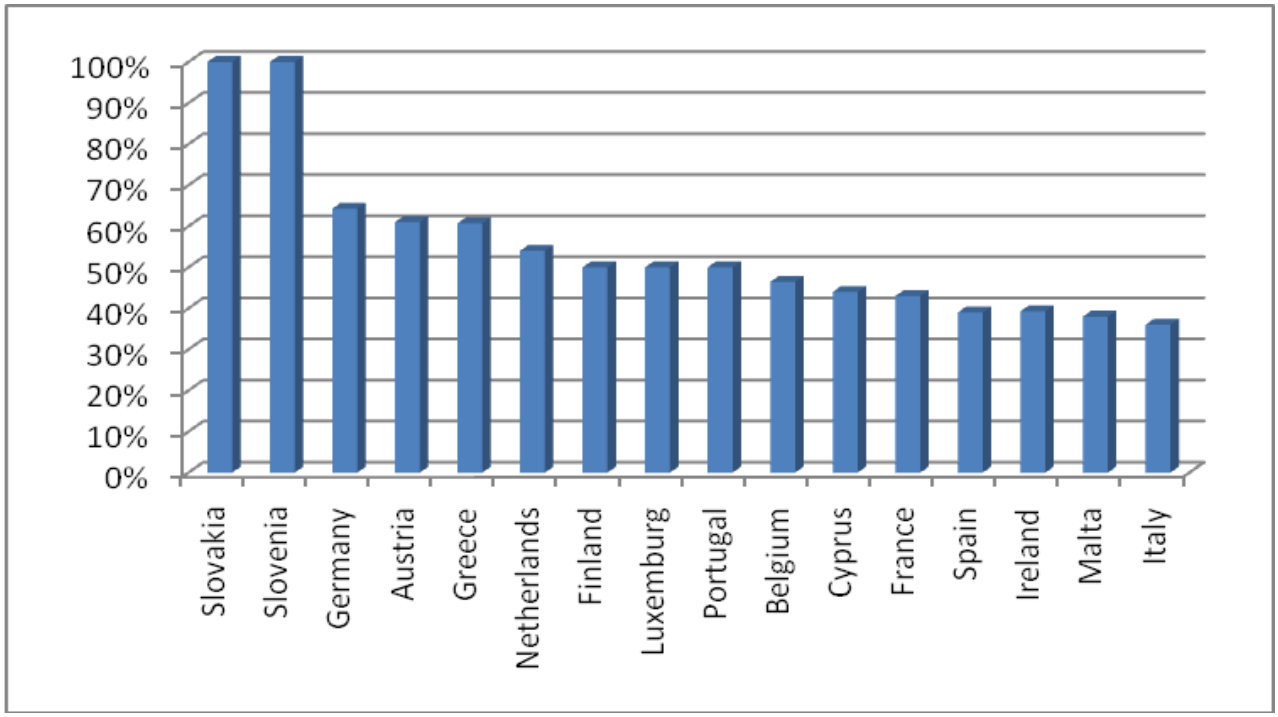


Figure 7. Conformity between interest rate decisions and inflation

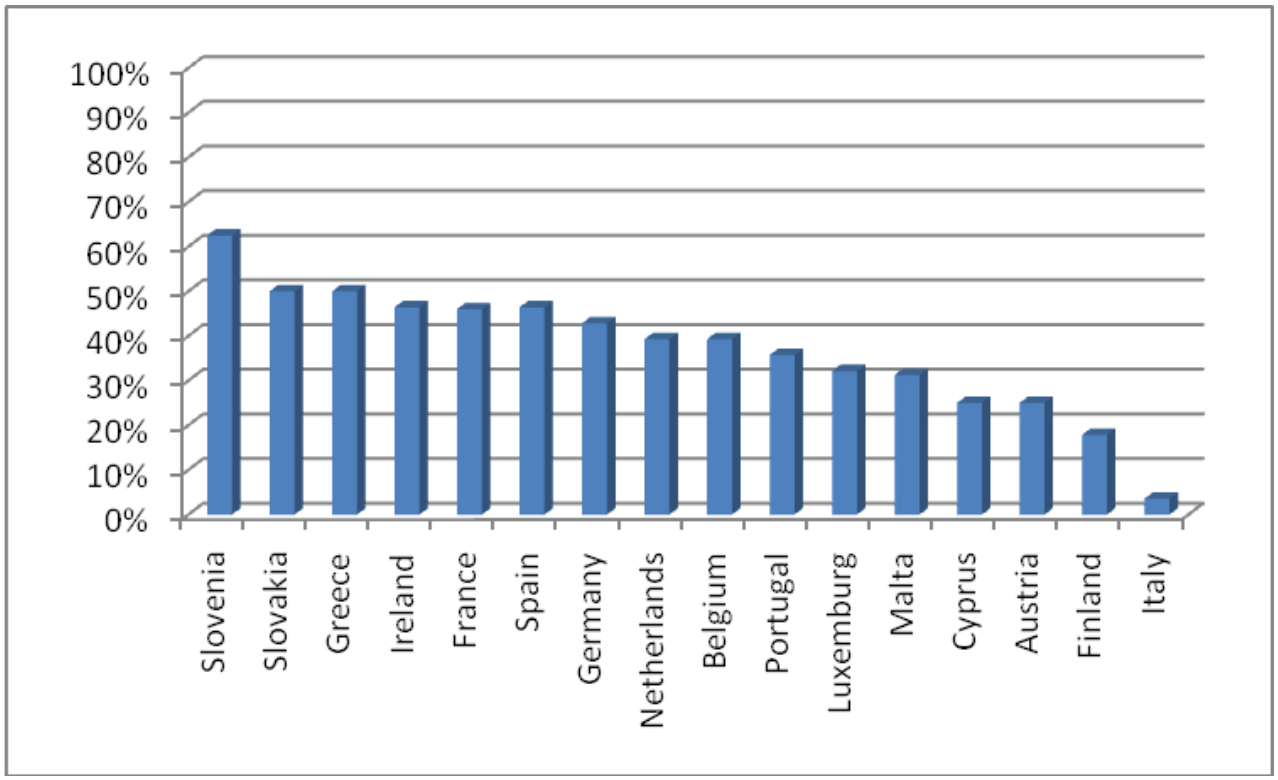


Table 2. Conformity between interest rate decisions and output gaps and inflation

Interest rates vs. output gaps

Country	Number	Percent
Slovakia	16/16	100%
Slovenia	16/16	100%
Germany	18/28	64%
Austria	17/28	61%
Greece	17/28	61%
Netherlands	15/28	54%
Finland	14/28	50%
Luxemburg	14/28	50%
Portugal	14/28	50%
Belgium	13/28	46%
Cyprus	7/16	44%
France	12/28	43%
Spain	11/28	39%
Ireland	11/28	39%
Malta	6/16	38%
Italy	10/28	36%

Interest rates vs. inflation

Country	Number	Percent
Slovenia	10/16	63%
Slovakia	8/16	50%
Greece	14/28	50%
Ireland	13/28	46%
France	13/28	46%
Spain	13/28	46%
Germany	12/28	43%
Netherlands	11/28	39%
Belgium	11/28	39%
Portugal	10/28	36%
Luxemburg	9/28	32%
Malta	5/16	31%
Cyprus	4/16	25%
Austria	7/28	25%
Finland	5/28	18%
Italy	1/28	4%

The tables presented above show the ranking of the countries in each calculation. They show the relative numbers and the percent for each country, and in order to see how well any country performed in these calculations, one has to look at both the numbers and the percent to get an idea of the results. Comment on the results will be presented in section 3.4.

3) The third calculation combines the results from calculation one on "interest rates versus output gaps" and calculation two on "interest rates versus inflation". To combine the two is interesting as this tells us something about the entire economic picture and not just the variables output gap and inflation separately. However, if the two are to be summarized, one has to consider if they are of equal importance when the interest rate is being set by the ECB. As outlined before, the ECB only has price stability as its goal. However, output gap and GDP growth have also proven important for the interest rate levels over time. Since we do not have evidence as to whether the one is more important than the other to the ECB and its interest rate decisions, I decide for them to be equally important in this calculation. This implies that this calculation on average conformity has to be interpreted according to an equal weighting of 0.5, and that altering these weights would change the result.

The result in this calculation is an average between the numbers and percentage on conformity between interest rates and output gaps and inflation. Accordingly, we have summed up each country's numbers and also calculated the percentage conformity, which will be an average. The result is an average conformity presented in figure 8 and table 3 below.

Figure 8. Average conformity between interest rate decisions and output gaps and inflation

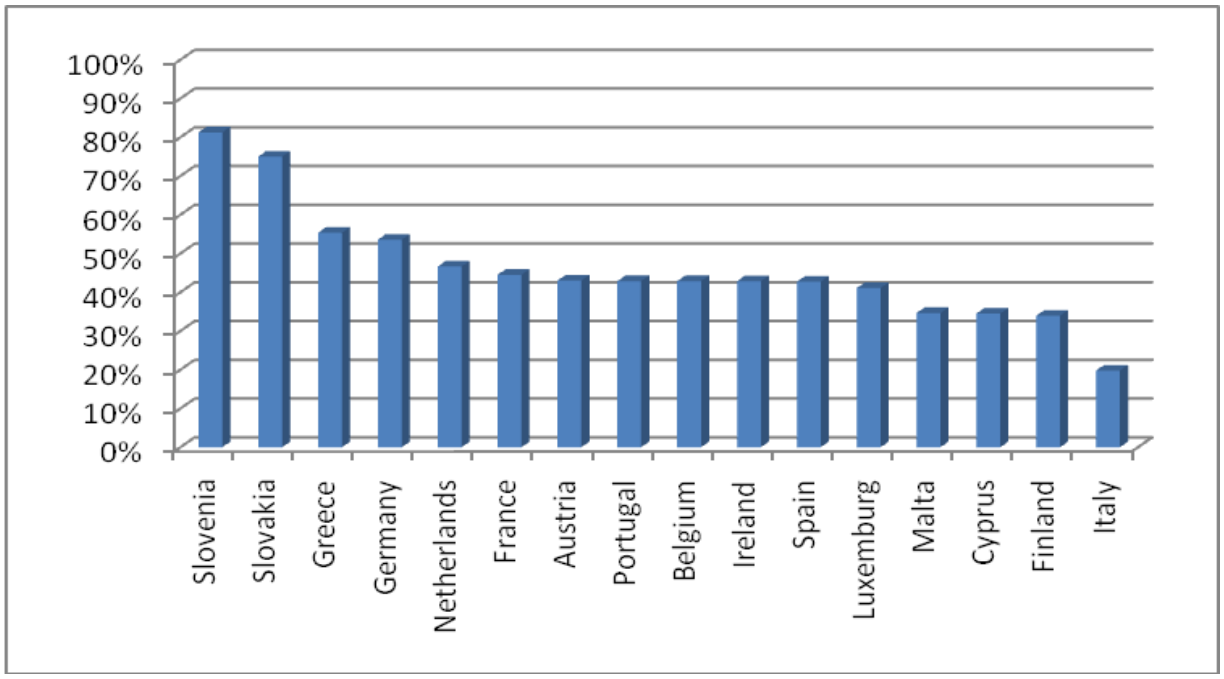


Table 3. Average conformity between interest rate decisions and output gaps and inflation combined

Country	Number	Percent
Slovenia	26/32	81%
Slovakia	24/32	75%
Greece	31/56	55%
Germany	30/56	54%
Netherlands	26/56	47%
France	25/56	45%
Austria	24/56	43%
Portugal	24/56	43%
Belgium	24/56	43%
Ireland	24/56	43%
Spain	24/56	43%
Luxemburg	23/56	41%
Malta	11/32	35%
Cyprus	11/32	35%
Finland	21/56	34%
Italy	11/56	20%

The table above illustrates the added numbers and the calculated average percent. In order to get a complete picture on which countries that overall performed best, one has to look both at the relative numbers and the percent. It has to be emphasized that the countries still have different denominators depending on whether they are new or old EMU member states. The old member states will have 56 (28+28) as denominator and the new member states will have 32 (16+16) as denominator. In order to rank the countries the percent is illustrative.

3.4 Comparison

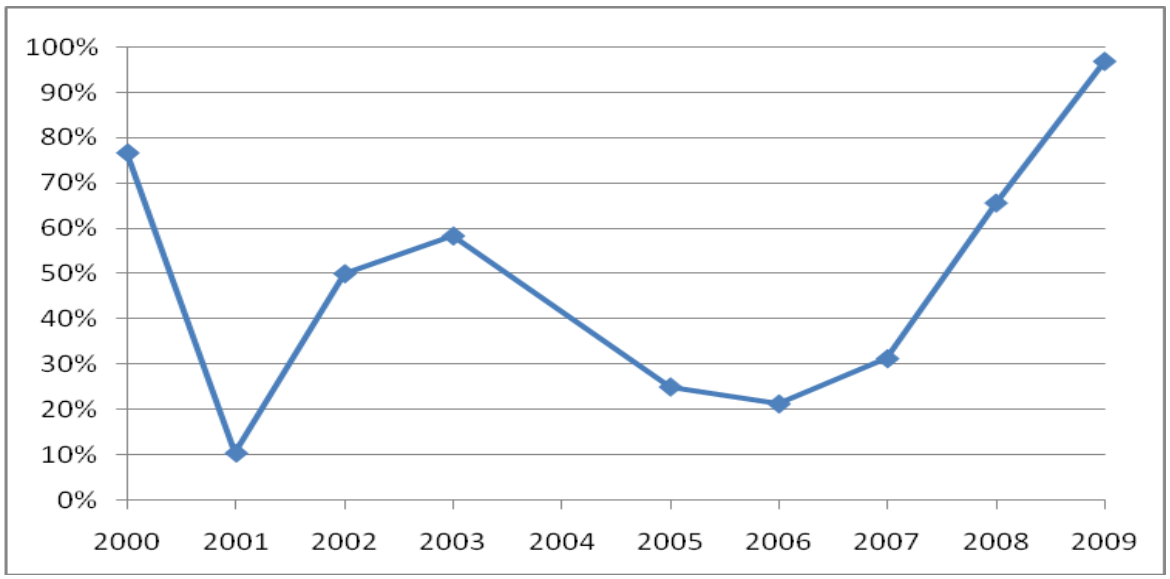
If we go back and look at figures 6 and 7 and their corresponding tables on page 28 and 29, one can easily witness the obvious differences in how often the interest rate decisions are favorable for each country. The tables show that the conformity between interest rates and output gaps varies from 36 to 100 percent and 4 to 63 percent for inflation. Let us now outline and comment on each calculation individually and also compare the two with each other.

3.4.1 Output gap

The results presented in figure 6 and table 2 show that there are in fact great differences in how often the interest rate decisions were favorable with regard to the forecasted output gap situations between the countries. The new member states Slovakia and Slovenia have 100 percent conformity between the interest rate decisions and output gaps. Other countries with high percentage are Austria, Germany, Greece, and the Netherlands. The bottom four, Spain, Ireland, Malta and Italy, are countries that according to the data in appendix C, have shown unstable and negative output gaps over time. This calculation also implies that the interest rate decisions have, in fact, not been favorable for these countries.

To see how the conformity between interest rates and output gaps have been for the Eurozone as a whole over time, I have conducted a calculation on all the interest rate decisions presented in table 1 and all the forecasts on output gap presented in the tables in appendix C. This calculation was carried out through counting how many countries were favored each year by the various interest rate decisions. To establish if an interest rate decision was right for a country the same theory as in calculation 1 on page 26 was used. This calculation sheds light on, and tells us something about, if and when a majority of the countries have benefitted from the interest rate decisions, and when the ECB made interest rate decisions that did not favor the Eurozone countries. The result is presented in figure 9 below and illustrates that the conformity has varied significantly over time for the aggregate Eurozone.

Figure 9. Variation on conformity between interest rates and output gap for the aggregate Eurozone (2000-2009)



From figure 9 it is apparent that the interest rate decisions in 2000 were strongly in accordance with the forecasted development for output gaps for the Eurozone-countries. As much as 76 percent of the interest rate decisions concurred with the output gap situations for the aggregate Eurozone. This tells us that the ECB's monetary policy at this point in time was right on target. However, this changed in 2001 where almost all the countries experienced positive output gaps, but the ECB decided to decrease the interest rate for the entire period, the result from the calculation tells us that the conformity at this point was only around 10 percent. This trend changed in 2002 and 2003 when the interest rates were decreased but were more suitable with regard to the economic development of the Eurozone-countries. The years of 2005 to 2007 are interesting because this was a long period when the interest rate decisions had low conformity with the forecasted output gap development. The average percentage conformity for these years was about 26 percent which is very low for a three year period. The data in appendix C and the key interest rates in table 1 inform us that the ECB increased the interest rate for this entire period, whilst many of the Eurozone-countries were projected to have significant negative output gaps. According to the theory that interest rates follow output gaps, the right policy would have been to decrease the interest rates in order to stimulate the economy and correct the negative output gaps. Ireland, Malta and Portugal (which from figure 6 and table 2 are the amongst the bottom six countries) were expressly projected to have large negative output gaps during this period. However the ECB did not react to the economic slowdown until 2008 when the interest rates were lowered. Since then the conformity between the interest rates and the projected output gaps have increased to a high level of about 96 percent in 2009.

3.4.2 Inflation

As for the calculations on interest rates versus inflation, table 2 and figure 7 indicate that there were also significant differences between the conformity between countries. The interest rate decisions were most on target, with regard to the forecasted inflation, in Slovenia, Slovakia and Greece. The bottom two were Italy and Finland. If we conduct the same type of calculation on variations of conformity as we did for the output gap in the previous section, we can illustrate the conformity between interest rates and inflation over time for the aggregate Eurozone. The result is presented in figure 10 on the following page.

Figure 10. Variation on conformity between interest rates and inflation for the aggregate Eurozone (2000-2009)

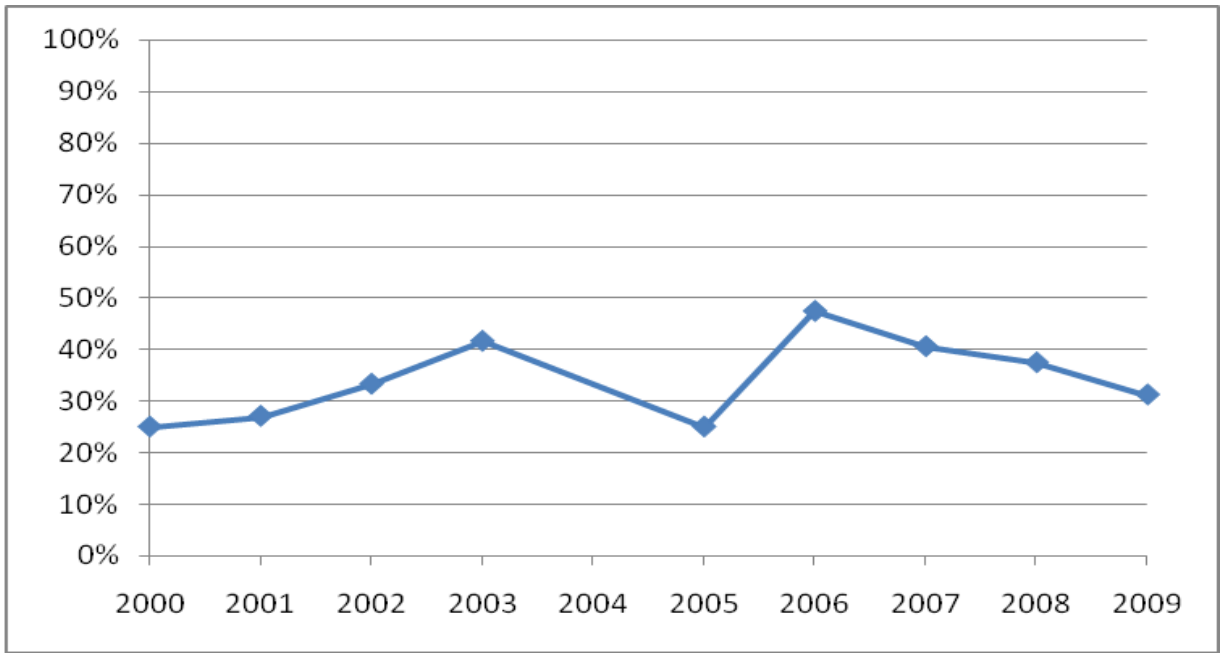


Figure 10 illustrates that there has only been a slight increase in conformity between interest rates and inflation from 2000 to 2009. There have not been any dramatic ups or downs over time and the result seems stable for the Eurozone as a whole. However, it is interesting to note that the conformity between any interest rate decision and the forecasted inflation has never been higher than 40 percent and that the average is just over 34 percent. This means that for all the interest rate decisions from April 28 in 2000 to May 13 in 2009 almost 66 percent of the countries did, at average, not benefit from the interest rate decisions. The evaluation from the data in appendix C and the calculations on interest rates versus inflation presented in table 2 imply that the countries that benefited the least over time were Italy and Finland. Both had very low forecasted inflation growth, just below 2 percent for the entire time period. Greece, Slovakia and Slovenia did benefit from the interest rate decisions and they proved to have rather high inflation growth, just over 3 percent at average. The implications will be evaluated and discussed in the conclusion.

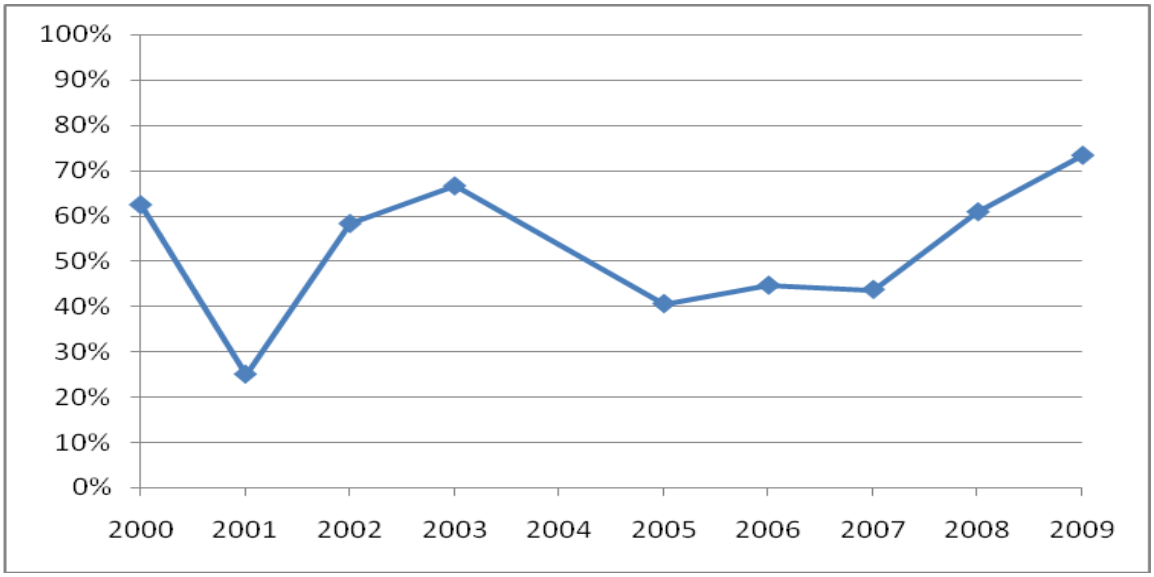
3.4.3 Output gap and inflation

Calculations and illustrations of the conformity between interest rates and output and inflation are individually interesting but the two combined gives us a more complete picture on the issue. When we combine the individually calculated results we end up with an average

conformity between interest rates and output gaps and inflation. Figure 8 and table 3 tell us that Slovenia and Slovakia are at the top. This is not surprising since the countries were uncontested in the "interest rates versus output gap" analysis with 100 percent conformity and also performed best when the focus was inflation. Older member countries like Greece, Germany, and the Netherlands, also benefit to a high degree from the single interest rate polices. However, most of the countries are on average neither favoured nor overlooked by the ECB's interest rate decisions as they have an average conformity between 40 to 50 percent. Finland and Cyprus are amongst the bottom three countries and cannot be said to benefit from the interest rate decisions. Italy performed worst in all calculations, so it is not surprising that it did so in this analysis as well. More discussion around the results will be presented in the conclusion.

If we conduct the same calculation on variation on conformity over time for the aggregate Eurozone we get the result in figure 11 below. We can see how the combined average has evened out the large ups and downs from table 9 but the line is not as straight as for the inflation analysis in figure 10. This implies that the interest rate decisions' appropriateness has varied over time for the Eurozone countries. It also suggests that the ECB is slow at reacting to slowdowns or boosts in the economy. However, from 2005 and forward, when many new countries joined the EMU, the trend has been more stable and the conformity has increased to the highest level since the start in 2000.

Figure 11. Variation on average conformity between interest rates and output gaps and inflation combined for the aggregate Eurozone (2000-2009)



4. Conclusion

As seen in the preceding analysis there are indications that suggest that the single monetary policy with a common interest rate benefits some EMU members more than others, with regard to their projected economic development. The answer to the question, "Are some EMU members more favoured by the ECB's interest rate decisions than others?" is then, yes. It can be seen from the data in appendix C that the countries that had the highest conformity between interest rate levels and output gaps were the countries that have shown a stabile and mostly positive GDP growth over time. These countries also had high projected inflation growths. These countries are Slovenia and Slovakia. It is surprising that these countries performed the best in both calculations, and because they did so in both, the result cannot be disregarded. Since this analysis is not country specific and more profound, the reasons to why Slovenia and Slovakia has benefited from the interest rate decisions from 2005 to 2009 is not obvious. One possible answer could be that both countries are flexible, new open economies whose economies rely much on the European market. This suggests that their economies fit the EMU-framework well. Their strong forecasted economic growth and the high inflation growth suggests that the countries might experience a catching-up effect: this means that the economies grow faster because they can benefit from using new EU market-available technologies and could replicate production methods that make the production more effective. From 2005, when Slovakia and Slovenia joined the EMU, the interest rates have been mostly increased. This obviously favours countries like Slovakia and Slovenia who experienced fast growing production and high inflation.

The countries that performed the worst in the preceding analysis were countries that showed too low, or too high, or unstable projected inflation growth over time, and often large negative output gaps. These countries' forecasted economic performances seem to deviate too much from the projected aggregate Eurozone growth path and were thus not benefited by the interest rate decisions that were made. From the average conformity calculation, these countries were Malta, Cyprus, Finland and above all, Italy.

It would be of benefit to specifically discuss Italy's situation. Italy was not benefited from the interest rates 2000 to 2009. Specifically, the country performed shockingly in the "interest rates versus inflation calculation", when only one of 28 decisions or equivalent 4 percent of the interest rates were the right decisions for Italy. The average combined conformity was around 20 percent and explanations to why Italy is un-favoured by the single monetary

policies might be that the country did not live up to any projections on strong economic development and the projected inflation growth was just around 2 percent during the entire time period. The "interest rates versus inflation calculation" assumed that when the inflation lies within the interval 1.8 to 2.2 percent, the right interest rate decision should be not to change the interest rate at all. Within this interval the inflation is stable and it does not need to be adjusted. Because Italy had a stable forecasted inflation growth around 2 percent during the entire time period it is obvious that the interest rate decisions did not favor Italy. The right interest rate decision for Italy would have been not to adjust the interest rate, however this was only applied once in 28th June, 2000 when the ECB "changed" the interest rate with 0 points. Even though the interest rate decisions did not fit the forecasted Italian inflation growth they do not seem to have made the inflation growth unstable over time. However, it is possible to think that the production growth has been affected negatively by the mismatched interest rates. The economy has not received the monetary stimulus required to correct the negative output gaps. The evidence that the monetary policy of the ECB does not favor countries equally could raise incentives or temptations to leave the union. This thought is also shared by Paul De Grauwe in his publication "The Eurozone: Problems and Prospects" where he states the fact that Italy have lost competiveness due to the inflation goal (all too low, he says) of 2 percent and because the interest rates have not fitted Italy's economy[51].

The average variation on conformity between interest rates and output gaps and inflation in figure 11 for the aggregate Eurozone from 2000 to 2009 has illustrated that during certain time periods the interest rate decisions have fitted the Eurozone better than at other points in time. Should this be thought of as a slack in the ECB's ability to perceive slowdowns in the economy or is it more of a structural problem? As the ECB is thought of as a conservative central bank, run on the German model, many of the asymmetric shocks that hit the Eurozone in 2003-2004 paralyzed the ECB and the only option for the central bank was to ensure price stability. As seen from table 1 and the key interest rates for the ECB, there were no interest rate decisions made in 2004. This either tells us that the ECB deliberately chose not to use its power on taking new interest rate decisions in order to signal a new monetary stance or the ECB was paralyzed by the shocks hitting the aggregate economy. However, the lack of conformity between the interest rates and the output gaps and inflation from 2005 to 2008 also illustrates the fact that the ECB does not react to shocks when deciding their interest rates; they mainly focus on price stability. Maybe this is a wise way for the ECB to operate its

[51] De Grauwe, *The Eurozone: Problems and Prospects*, p. 18.

monetary policy as it creates clear and stabile politics, but as seen from the analysis in section 3, many countries are not favoured by the monetary stance. However, recent monetary actions illustrate a different direction for the ECB. Today, the interest rate level is 1 percent for the Eurozone; this is the lowest since the beginning of the EMU. Data from appendix C informs us that the forecasted output gaps for 2010 are projected to be significantly negative and will remain low for the entire area. Inflation growth is also forecast to be lower than the price stability goal of about 2 percent. The global economic slowdown has thus affected the ECB in their incentives to try to stimulate the economy, and to lower the interest rates. This contradicts the statement that the ECB is a conservative central bank that does not react to shocks hitting the economy. This might imply that the ECB has different interest rate decision criterions at different points in time, and that shocks hitting the aggregate economy thus have an impact. Or maybe the varying bad fit between interest rates and economic forecasts is an innate problem of the ECB which ultimately means that the bank is not capable of providing the best monetary policy for its members. However, the ECB is not the only institution or actor responsible for the EMU member countries' economic performances. Other institutions within the EU and the EMU members' own governments, are also responsible for operating in a way and implementing measures that promotes economic growth and stability. One could consider that the countries most benefitted by the ECB's interest rate decisions in this analysis are the ones who implement and work on all the structural convergence policies that the Stability and Growth Pact has prescribed. One way to explain Italy's bad conformity with the ECB's interest rate decisions could be that Italy has implemented these structural convergence policies in a poor way and thus doesn't operate as expected. Thus, the ECB isn't all to blame.

The differences in inflation growth between countries could be explained by the Balassa-Samuelson effect outlined earlier. It is possible that countries like Slovakia, Slovenia, and Ireland have experienced high inflation growth over time because they also have high productivity growth. If this is the case then the countries are not harmed by the fact that the ECB has been unable to adjust the high inflation level. The calculations in this essay might suggest that they are in fact not harmed because the countries performed well in the analysis and seems to be favoured by the interest rates.

The Governing Council of the ECB meets one time a month and decides whether or not to change the interest rate level. When they do change the interest rate level, this is publicly announced and table 1 illustrates the key interest rate levels that have been publicized. When they do not change the interest rate level the Governing Council's meeting goes by unnoticed,

and further, the decision not to change the interest rates is not publicized. This affects the analysis and the calculations in this essay. If the ECB does not change the interest rate level they must consider the aggregate economy to be stable because no adjustment has to be made. Countries like Italy, who have shown stable forecasted inflation growth over time, would have benefited if these *decisions not to change* the interest rate would have been included in the analysis. Every time Italy had an inflation growth between 1.8 to 2.2 percent and the ECB did not change the interest rate level this was a correct monetary policy decision for Italy, although not publicly announced. This reasoning is also applicable for other countries that have shown stable inflation growth over time but were not favored in the calculation on interest rates and inflation. One could consider that if all the non-changes would have been included as a proper interest rate decision in the analysis, the results would be different. However, the calculations and results presented in this essay also shed light on whether the publicized interest rates favoured certain countries more than others, as the publicly announced interest rate changes are in fact the ones that the public, corporations and governments base their inflation expectations on. These publicized interest rate changes are the ones that have the most impact on the economy and the stabilization of prices.

All the evidence and data has shown us that there are in fact countries that are more favoured by the interest rate decisions than others. Too much emphasizes should not be put on which country performed the best or worst in the calculations since these could be altered and are somewhat subjective due to intervals etc. The importance is to recognize the fact that the results illustrate that there is a vast difference between how often countries have benefitted from the interest rates set by the ECB from 2000 to 2009. This leads to the conclusion that there should exist different incentives and motivations between countries concerning how attractive the EMU and the single monetary policy are. If countries feel that they are not favoured by the single interest rate and the monetary policies this could lead to or increase incentives to leave the union. Other non-EMU members, like Sweden and the UK, could also vindicate their decision not to enter the monetary union because of the evidence that countries are differently favoured and at times the ECB and its interest rates does not react to slowdowns or negative economic development. A national central bank whose only concern is the national economy would seem more safe and beneficial.

4.1 Further research

In order to investigate if the monetary union fits certain member states better than others, and not just to look at the interest rate decisions implemented by the ECB, one could consider many other aspects of the union, such as structural rigidities, divergence problems, underlying inflation and the labor market. Considering the size of the interest rate change could also be an interesting topic to examine: as the EMU members perform economically different they should also require a different size of an interest rate level change. My investigation, whether the interest rates favor some member state more than others, sheds light only on one little part of the complex system. The findings could imply that some policy changes are in order but, to fully grasp the complete picture, substantial further research should be carried out. Another related angle to this essay's topic is to look at how the relative competiveness between the Eurozone-countries has developed over time and see if the single monetary policy and nominal interest rates have affected countries negative or positive.

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Appendix A

The ECB has defined price stability for the Euro area in terms of the Harmonized Index of Consumer Prices (HICP). The main idea of the HICP is to break down the concept into individual components in order to identify the different economic factors that contribute and have an impact on consumer price development. For example, food prices are divided into processed and unprocessed foods, because the prices of the latter are influenced by external factors such as weather etc; Please see table 4 for a complete breakdown of the HICP.[52]

Table 4. Weights of the main euro area HICP components applicable for 2003[53]

Overall index	100.00
Goods prices	*59.1*
Unprocessed food	7.6
Processed food	11.7
Non-energy industrial goods	31.6
Energy	8.2
Services	*40.9*
Housing services	10.4
Transport	6.3
Communication	2.9
Recreation and personal services	14.9
Miscellaneous	6.4

The HICP reflects a weighted average between countries in the euro area, depending on the variables listed in table 4 above and reflects what we more generally call *inflation*.

[52] The European Central Bank (2004), *The monetary policy of the ECB*, p. 53.
[53] IBID.

Appendix B

For the interested reader, this appendix describes more detailed the technicalities on how the ECB carry out its open market operations. Table 5 on following page illustrates a scheme of the differences between the open market operations available for the ECB.

The ECB can use two different groups of operations to conduct the single monetary policy, open market operations, and standing facilities. The most commonly used and important group of operations is the open market operations. These play an important role in steering interest rates, managing the liquidity situation on the market, and signaling the stance of the monetary policies. *Main refinancing operations* (MROs) represent the most important open market operation and the lending is carried out through reversed transactions. Reversed transactions imply that the ECB buys assets under a repurchase agreement or grants loans against assets given as collateral reversed transactions, therefore the reversed transactions are temporary and provides funds for a limited period only. The ECB can also manage the liquidity situation and fine tune the interest rate level, through *fine-tuning operations* where outright purchases and foreign exchange swaps are possible transactions, but fine-tuning is most often carried out by the NCBs. *The structural operations* help the ECB, through the NCBs, to affect the Euro system's structural position against the financial sector. All these open market operations are used for different purposes and have different effects on the monetary policy.[54,55]

The purpose of using standing facilities is to restrict and control the volatility of short-term interest rates, and the Euro system offers two standing facilities to its counterparties (such as banks): marginal lending facility and deposit facility. The standing facilities are managed by the decentralized NCBs and the interest rate on the marginal lending facility is normally considerably higher than the corresponding market rate, and for the deposit facility the interest rate is normally substantially lower than the market rate. This is called a ceiling and a floor for the overnight interest rate in the money market and creates a 'corridor', within which the overnight money market interest rate can fluctuate.[56]

[54] The European Central Bank (2008), *The implementation of monetary policy in the euro area: General Documentation on Euro system monetary policy instruments and procedures*, p. 9
[55] The European Central Bank (2004), *The monetary policy of the ECB*, p. 75.
[56] IBID, p. 75-76.

Table 5. Euro system open market operations and standing facilities[57]

Monetary policy operations	Types of transactions		Maturity	Frequency
Open market operations	**Liquidity providing**	**Liquidity absorbing**		
Main refinancing operations	• Reverse transactions	___	• One week	• Weekly
Long-term refinancing operations	• Reverse transactions	___	• Three months	• Monthly
Fine-tuning operations	• Reverse transactions • Foreign exchange swaps • Outright purchases	• Foreign exchange swaps • Collection of fixed-term deposits • Outright sales	• Non-standardized	• Non-regular
Structural operations	• Reverse transactions • Outright purchases	• Issuance of debt certificates • Outright sales	• Standardized/ non-standardized __	• Regular and non-regular • Non-regular
Standing facilities				
Marginal lending facility	• Reverse transactions	__	• Overnight	• Access at the discretion of counterparties
Deposit facility	__	• Deposits	• Overnight	• Access at the discretion of counterparties

[57] The European Central Bank (2008), *The implementation of monetary policy in the euro area: General Documentation on Euro system monetary policy instruments and procedures*, table 4.1, p. 73.

Appendix C

Below follows all the data that was processed in order to carry out the analysis and comparison on ECB interest rate decisions. Each table represents the available forecasted data on output gap and inflation that forms the opinion on the economic development for each country and is applicable for the interest rate decisions. For some of the new member countries there are no available data in the earlier years. The data in the tables have been analyzed and compared with the key interest rates from table 1 at page 21. The tables should be interpreted as follows, the interest rate decisions based on the data for each table is presented on the table head, the forecasted year is signaled in the left hand column, and which European Commission forecast that has been used to collect data is presented above the actual figures. The data on output gap and inflation is measured in percent, where output gap is relative to potential GDP growth.

		Interest rate decisions April 28; June 9 and 28 ; September 1, 2000 use:	
Forecasted Year 2001	**Country**	**Forecast on output gap made spring 2000**	**Forecast on inflation made spring 2000**
	Austria	0.1	1
	Belgium	0.6	1.4
	Cyprus	-	-
	Finland	1.3	2
	France	0.5	1.2
	Germany	0.2	1.6
	Greece	1.5	2.3
	Ireland	2.1	3
	Italy	0.2	1.9
	Luxemburg	0.8	1.8
	Malta	-	-
	Netherlands	0.8	3.4
	Portugal	0.3	2.1
	Slovakia	-	-
	Slovenia	-	-
	Spain	0.3	2.2

Interest rate decision October 6, 2000 use:			
Forecasted year 2001	**Country**	**Forecast on output gap made autumn 2000**	**Forecast on inflation made autumn 2000**
	Austria	0.2	1.6
	Belgium	0.4	1.5
	Cyprus	-	-
	Finland	1.9	2.2
	France	0.4	1.7
	Germany	-0.2	1.7
	Greece	0.6	2.3
	Ireland	3.5	3.1
	Italy	-0.1	1.8
	Luxemburg	1.6	1.9
	Malta	-	-
	Netherlands	1	2.8
	Portugal	0.3	2.3
	Slovakia	-	-
	Slovenia	-	-
	Spain	0.8	2.2

Interest rate decisions May 11; August 31; September 18, 2001 use:			
Forecasted year 2002	**Country**	**Forecast on output gap made spring 2001**	**Forecast on inflation made spring 2001**
	Austria	-0.2	1.4
	Belgium	0.6	1.7
	Cyprus	-	-
	Finland	1.6	2
	France	0.5	1.6
	Germany	0.1	1.5
	Greece	1.8	2.3
	Ireland	2.3	3.6
	Italy	0.4	1.9
	Luxemburg	1	1.8
	Malta	-	-
	Netherlands	0.7	2.9
	Portugal	0.3	2.3
	Slovakia	-	-
	Slovenia	-	-
	Spain	0.5	2.3

Interest rate decision November 9, 2001 use:			
Forecasted Year 2003	**Country**	**Forecast on output gap made autumn 2001**	**Forecast on inflation made autumn 2001**
	Austria	0.1	1.8
	Belgium	0.1	1.4
	Cyprus	-	-
	Finland	0.4	2.2
	France	0.1	1.5
	Germany	-0.6	1.5
	Greece	1.4	2.9
	Ireland	1.5	2.9
	Italy	0.1	1.8
	Luxemburg	0.3	1.7
	Malta	-	-
	Netherlands	-0.1	2.2
	Portugal	0.4	1.9
	Slovakia	-	-
	Slovenia	-	-
	Spain	0.4	2.1

Interest rate decision December 6, 2002 use:			
Forecasted year 2004	**Country**	**Forecast on output gap made autumn 2002**	**Forecast on inflation made autumn 2002**
	Austria	-0.5	1.5
	Belgium	0.1	1.7
	Cyprus	-	-
	Finland	-0.2	2
	France	0	1.6
	Germany	-0.7	1.2
	Greece	1.1	3.3
	Ireland	0.3	3.1
	Italy	0	1.9
	Luxemburg	-1.1	1.8
	Malta	-	-
	Netherlands	-0.8	2.4
	Portugal	-0.7	2.5
	Slovakia	-	-
	Slovenia	-	-
	Spain	0.1	2.4

Interest rate decision March 7, 2003 use:			
Forecasted year 2004	**Country**	**Forecast on output gap made autumn 2002**	**Forecast on inflation made autumn 2002**
	Austria	-0.5	1.5
	Belgium	0.1	1.7
	Cyprus	-	-
	Finland	-0.2	2
	France	0	1.6
	Germany	-0.7	1.2
	Greece	1.1	3.3
	Ireland	0.3	3.1
	Italy	0	1.9
	Luxemburg	-1.1	1.8
	Malta	-	-
	Netherlands	-0.8	2.4
	Portugal	-0.7	2.5
	Slovakia	-	-
	Slovenia	-	-
	Spain	0.1	2.4

Interest rate decision June 6, 2003 use:			
Forecasted year 2004	**Country**	**Forecast on output gap made spring 2003**	**Forecast on inflation made spring 2003**
	Austria	0	1.8
	Belgium	-0.3	1.3
	Cyprus	-	-
	Finland	-0.4	1.5
	France	-0.1	1.5
	Germany	-1.1	1.2
	Greece	1.2	3.5
	Ireland	0.8	3.2
	Italy	-0.2	1.9
	Luxemburg	-1.5	1.6
	Malta	-	-
	Netherlands	-1	1.5
	Portugal	-0.7	2.3
	Slovakia	-	-
	Slovenia	-	-
	Spain	0	2.7

Interest rate decision December 6, 2005 use:			
Forecasted Year 2007	**Country**	**Forecast on output gap made autumn 2005**	**Forecast on inflation made autumn 2005**
	Austria	-0.9	1.7
	Belgium	-1	1.9
	Cyprus	0.4	2.1
	Finland	-0.5	1.3
	France	-1	1.9
	Germany	-0.4	1.1
	Greece	2.2	3
	Ireland	-2.6	2.4
	Italy	-1.2	1.9
	Luxemburg	-1.2	2.2
	Malta	-5.1	2.2
	Netherlands	-1.4	1.9
	Portugal	-2.6	2.2
	Slovakia	0.2	2.1
	Slovenia	0.2	2.5
	Spain	-0.5	2.6

Interest rate decision March 8, 2006 use:			
Forecasted year 2007	**Country**	**Forecast on output gap made autumn 2005**	**Forecast on inflation made autumn 2005**
	Austria	-0.9	1.7
	Belgium	-1	1.9
	Cyprus	0.4	2.1
	Finland	-0.5	1.3
	France	-1	1.9
	Germany	-0.4	1.1
	Greece	2.2	3
	Ireland	-2.6	2.4
	Italy	-1.2	1.9
	Luxemburg	-1.2	2.2
	Malta	-5.1	2.2
	Netherlands	-1.4	1.9
	Portugal	-2.6	2.2
	Slovakia	0.2	2.1
	Slovenia	0.2	2.5
	Spain	-0.5	2.6

		Interest rate decisions June 15; August 9; October 11, 2006 use:	
Forecasted Year 2007	**Country**	**Forecast on output gap made spring 2006**	**Forecast on inflation made spring 2006**
	Austria	-0.3	1.6
	Belgium	-1	2.1
	Cyprus	0	2.2
	Finland	-0.4	1.4
	France	-1.3	1.8
	Germany	-0.3	2.3
	Greece	1.9	3.3
	Ireland	-2.9	2.3
	Italy	-1.4	2
	Luxemburg	-1	3.4
	Malta	-1.6	2.7
	Netherlands	-1	2.1
	Portugal	-2.3	2.4
	Slovakia	0.2	2.7
	Slovenia	0.1	2.5
	Spain	-1.5	3.1

		Interest rate decision December 13, 2006 use:	
Forecasted year 2008	**Country**	**Forecast on output gap made autumn 2006**	**Forecast on inflation made autumn 2006**
	Austria	0	1.7
	Belgium	-0.7	1.7
	Cyprus	-1.3	2.4
	Finland	-0.2	1.6
	France	-0.9	1.9
	Germany	0.1	1.2
	Greece	1.8	3.3
	Ireland	-2.7	2.2
	Italy	-1.1	1.9
	Luxemburg	-0.9	1.8
	Malta	-0.5	2.4
	Netherlands	0	2.3
	Portugal	-1.5	2.1
	Slovakia	1.6	2.5
	Slovenia	0.4	2.6
	Spain	-1.3	2.7

Interest rate decision March 14, 2007 use:			
Forecasted year 2008	**Country**	**Forecast on output gap made autumn 2006**	**Forecast on inflation made autumn 2006**
	Austria	0	1.7
	Belgium	-0.7	1.7
	Cyprus	-1.3	2.4
	Finland	-0.2	1.6
	France	-0.9	1.9
	Germany	0.1	1.2
	Greece	1.8	3.3
	Ireland	-2.7	2.2
	Italy	-1.1	1.9
	Luxemburg	-0.9	1.8
	Malta	-0.5	2.4
	Netherlands	0	2.3
	Portugal	-1.5	2.1
	Slovakia	1.6	2.5
	Slovenia	0.4	2.6
	Spain	-1.3	2.7

Interest rate decision June 13, 2007 use:			
Forecasted year 2008	**Country**	**Forecast on output gap made spring 2007**	**Forecast on inflation made spring 2007**
	Austria	0.8	1.7
	Belgium	-0.6	1.8
	Cyprus	-0.6	2
	Finland	-0.1	1.7
	France	-0.9	1.7
	Germany	0.9	1.7
	Greece	1.6	3.1
	Ireland	-1.6	2.2
	Italy	-0.9	2
	Luxemburg	-0.4	2.7
	Malta	0.1	2.1
	Netherlands	-0.1	2.1
	Portugal	-1.2	2.3
	Slovakia	1.8	2.4
	Slovenia	0.4	2.7
	Spain	-1.3	2.6

Interest rate decision July 9; (October 8, 9) and 15, 2008 use:			
Forecasted year 2009	**Country**	**Forecast on output gap made spring 2008**	**Forecast on inflation made spring 2008**
	Austria	0.6	1.9
	Belgium	-1	2.3
	Cyprus	-0.6	2.5
	Finland	-0.4	2.3
	France	-0.8	2
	Germany	0.8	1.8
	Greece	0.7	3.7
	Ireland	-2	3.6
	Italy	-1.6	2.2
	Luxemburg	-1.3	2.5
	Malta	0	2.2
	Netherlands	0.4	2.9
	Portugal	-1	2.3
	Slovakia	2.5	3.2
	Slovenia	0.2	3.3
	Spain	-2.1	2.6

Interest rate decision November 12; December 10, 2008 use:			
Forecasted year 2010	**Country**	**Forecast on output gap made autumn 2008**	**Forecast on inflation made autumn 2008**
	Austria	-0.5	1.9
	Belgium	-1.9	2
	Cyprus	-0.4	3.2
	Finland	-1.1	1.8
	France	-1.6	1.7
	Germany	-0.2	1.9
	Greece	0.2	3.3
	Ireland	-2.9	1.8
	Italy	-1.8	2.1
	Luxemburg	-2.6	2.7
	Malta	-0.1	2.2
	Netherlands	-0.9	2.3
	Portugal	-1.7	2.1
	Slovakia	-0.7	3.3
	Slovenia	-0.6	3.1
	Spain	-3.1	2.8

Interest rate decision January 21; March 11. 2009 use:			
Forecasted Year 2010	**Country**	**Forecast on output gap made autumn 2008**	**Forecast on inflation made autumn 2008**
	Austria	-0.5	1.9
	Belgium	-1.9	2
	Cyprus	-0.4	3.2
	Finland	-1.1	1.8
	France	-1.6	1.7
	Germany	-0.2	1.9
	Greece	0.2	3.3
	Ireland	-2.9	1.8
	Italy	-1.8	2.1
	Luxemburg	-2.6	2.7
	Malta	-0.1	2.2
	Netherlands	-0.9	2.3
	Portugal	-1.7	2.1
	Slovakia	-0.7	3.3
	Slovenia	-0.6	3.1
	Spain	-3.1	2.8

Interest rate decision April 8; May 13. 2009 use:			
Forecasted Year 2010	**Country**	**Forecast on output gap made spring 2009**	**Forecast on inflation made spring 2009**
	Austria	-3.3	1.1
	Belgium	-3.8	1.2
	Cyprus	-1.3	2
	Finland	-3.9	1.1
	France	-3.1	0.9
	Germany	-3.7	0.7
	Greece	-2.4	2.3
	Ireland	-8.5	0.4
	Italy	-4	1.8
	Luxemburg	-5.9	2
	Malta	-1.1	1.8
	Netherlands	-3.3	0.9
	Portugal	-3.5	1.7
	Slovakia	-2.2	2.4
	Slovenia	-2.7	2
	Spain	-3.6	1.4

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[58] http://ec.europa.eu/economy_finance/publications/specpub_list12526.htm, Forecasts 2000-2009