

NORWEGIAN UNIVERSITY OF LIFE SCIENCES





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## Abstract

The European Economic and Monetary Union (EMU) is a historic construction. It is a monetary union among sovereign states that have surrendered their monetary policy and entered a fixed exchange rate regime, while maintaining an autonomous fiscal policy. Internal and external macroeconomic imbalances have developed between the member states since the creation of the monetary union, but the effect of this development became more visible after the financial crisis, as it led to some European states requiring emergency assistance from the IMF and the EU.

This thesis studies whether the development of imbalances in three southern European countries, namely Greece, Italy and Spain, were: (a) the result of purely domestic sources; (b) the result of domestic difficulties amplified by EMU membership; or (c) the result of these countries joining the EMU, regardless of their domestic state of affairs prior to membership. The purpose is to understand what caused the imbalances to develop, as this has implications for the long run survival of the EMU, as well as how to construct potential new monetary unions between sovereign states.

The method used is a country-specific case study of Greece, Italy and Spain, highlighting the differences and similarities of macroeconomic and microeconomic variables as well as policies between the countries from 1992 until 2011. To reveal when the imbalances started to develop the sample years have been divided into three periods: a pre-EMU, a core-EMU and a crisis-response period. The results are discussed for each country to discover the sources of the internal and external imbalances, and to evaluate whether the already suggest policy measures will remedy and hinder reoccurrence of the current problems in the EMU.

The outcome of the case study is that the EMU membership amplified existing domestic imbalances in Greece, Italy and Spain. This amplification happened due to the more integrated financial market that led to the disappearance of the long-term interest rate spreads, resulting in easier access to credit for the government. Italy and Greece took advantage of this, while in Spain, the more integrated financial market caused the private sector to take on excessive debt. Greece, Italy and Spain experienced higher cost growth relative to the other EMU member countries, causing above average inflation and an appreciation of the real exchange rate. The countries lost competitive power relative to the other EMU member states and emerging markets. Identified sources of external imbalances were declining private and public saving rates combined with increased investment that created balance of trade deficits.

Italy and Greece exemplify that a monetary union between sovereign states is doomed to fail when the regulatory framework lacks strong sanction possibilities. This is due to moral hazard on both the lending side, represented by the financial institutions, and on the borrowing side, represented by the governments. The presented evidence suggests that stricter financial regulation and firmer sanctions in the Stability and Growth Pact (SGP) are needed if the EMU is to survive in the long run, as the control mechanisms of the countries' fiscal policy were too weak, relative to the large negative spillover effects from reckless borrowing.

The policy implications that inform this, is that the EMU do not need to form a federal state or a fiscal union to survive in the long run, if the new macroeconomic surveillance regime as well as the SGP is obeyed to by all member states, in addition to implementation of an EMU-wide financial regulation framework. The main findings of this study can be generalized to other potential monetary unions in the making without a fiscal union, keeping in mind the limited nature of examining only three of the current 17 EMU member states.

**Keywords:** EMU, monetary union, fixed exchange rate regime, BOT deficit, current account deficit, external imbalances, financial crisis, sovereign debt, fiscal union.



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# 1. Introduction

The largest modern experiment of a monetary union began January 1, 1999, as 11 member states of the European Union (EU) joined the European Economic and Monetary Union (EMU). The unification was completed when the member states abandoned their national currencies for the common euro in 2002.

A monetary union is when countries agree to use the same currency that is managed by one common central bank (De Grauwe 2009). To facilitate such a union, a new currency must be created and a supranational central bank must be founded. This makes a monetary union the strongest form of a fixed exchange rate regime among the participant countries, as each gives up their domestic currencies entirely. The national governments lose the ability to conduct independent monetary policy by adjusting the short-term interest rate, manipulating the exchange rate or issuing currency.

To fully benefit from the creation of a monetary union, the involved countries need to already be part of an integrated market of goods and services. They need to coordinate their fiscal policies, facilitate labor and capital mobility among themselves and bring their business cycles into alignment to avoid asymmetric macroeconomic shocks. A system of fiscal transfers is necessary if the former criteria are not met to help bring markets into equilibrium.

The EMU was created to accelerate the European economic integration by removing transaction barriers and reducing exchange rate volatility. The idea was that a common currency would make the free mobility of goods, capital, and labor within the EU easier to achieve, thus strengthening the single market. Member countries of EMU were no longer able to manipulate the exchange rate to fulfill short-term economic targets, as the European Central Bank (ECB) was founded to execute a common monetary policy consisting of low and stable inflation. The Stability and Growth Pact (SGP) was created to secure sound national fiscal policies and to contribute to price stability within the member countries. The pact limits the government deficit to a maximum of 3 percent of gross domestic product (GDP) and the government debt to a maximum of 60 percent of GDP.

Structural differences between the countries in the EMU were thought to decrease as the economic and monetary integration process proceeded, but has instead resulted in economic divergence (Holinski et al. 2012). The sovereign-debt crisis unfolding in 2010 in the southern European countries, brought about by the financial crisis, is a symptom of both internal and external economic imbalances such as excessive construction activity and the accumulation of trade surpluses by some members and deficits by others. Aggregated external trade in EMU

has been close to balance, hiding the increasing disparity. Southern European countries such as Greece, Italy, Portugal and Spain now have current account deficits, while northern European countries such as Austria, Finland, Germany and the Netherlands have surpluses. This is a contrast to the situation prior to 1999, when Germany and Austria had current account deficits, while Greece and Spain were close to balance, and Italy had surpluses (Eurostat 2012).

The average fiscal deficit in EMU rose to 6.2 percent of GDP in 2010 from 0.7 percent in 2007. The average government debt was 85 percent of GDP in 2010, compared to 66 percent in 2007. Worst affected are the so-called PIIGS-countries, Portugal, Ireland, Italy, Greece and Spain. Ireland's government debt in 2010 was 92.5 percent of GDP and the deficit was 31.3 percent of GDP. In Portugal, the debt was 93.3 percent of GDP and the deficit 9.8 percent, while the corresponding numbers were 145 percent and 10.6 percent in Greece. Italy's debt was 119 percent of GDP in 2010, while the deficit was 4.6 percent. Spain's debt was 60 percent in 2010 and the deficit was 9.3. The corresponding 2011 numbers display that all the above mentioned countries' debt increased while their deficits declined (Eurostat 2012).

The European Commission is the EU's executive body consisting of one representative from each of the 27 member states, and monitors country-specific fiscal policy within the EMU. They report to the European Council, which consists of all heads of states in the EU that act as a collective EU presidency, if a country is suspected of having developed an excessive deficit, thereby violating the 3 percent ceiling specified in the SGP. Article 126 in the Treaty on the Functioning of the European Union (TFEU) specifies an excessive deficit procedure (EDP) that countries breaching the deficit criterion must follow. The EDP consists of the Council recommending how to correct the deficit and a deadline for doing so, unless the economic situation is exceptional and temporary, and the government deficit is close to the ceiling. If the country fails to restore balance, the Council implements one of the following sanctions: the European Investment Bank (EIB) can reconsider its lending practice to the country; the country is forced to provide additional information to the Council before issuing bonds; the country must make a non-interest bearing deposit with the EU until the deficit is corrected; or the country can be fined an amount specified by the Council (TFEU 2008).

Fourteen out of 17 EMU member states had on-going excessive deficits in January 2012, meaning that 14 member states have violated the deficit criterion since 1999 (European Commission 2012a). When Germany and France exceeded the limit in 2002 and 2003 without

being sanctioned, the door was left open for other nations to follow. Portugal, Austria and Belgium have violated the debt criterion since 2005, and Italy and Greece since before they joined the EMU (Eurostat 2012). The past and current violations of the SGP demonstrate the problems with enforcing the rules (Buti et al. 2003, Tsoukalis 2012).

In the years prior to the financial crisis, average government debt decreased in the euro zone by approximately 5 percent of GDP, while household debt increased by 20 percent and by 70 percent in the banking sector (De Grauwe 2010). A more integrated European capital market, providing increasingly efficient intermediation, caused a credit boom that allowed the gap among the EMU member countries trade balances' to widen. The "sudden stop" of private capital inflow after the financial crisis led to the PIIGS-countries experiencing liquidity difficulties that ultimately revealed real solvency problems for some of the countries (Gros 2012a).

The current macroeconomic prospects make EMU's future uncertain. The PIIGS-countries are facing severe fiscal cutbacks to regain trust from the financial market, other EMU members and the rest of the world. Lower demand and consumption combined with tightened access to credit has led to descending trajectories of economic growth. The soaring unemployment rates caused government tax revenues to drop and expenditures to rise. Increased government spending could ease the struggle for the countries facing a recession, but the fiscal stimulus packages from 2008 and 2009 have been replaced with various austerity measures demanded by *the Troika* consisting of the European Commission, the ECB and the International Monetary Fund (IMF).

I will investigate the reasoning behind the creation of a monetary union among sovereign states. I will try to answer whether such a union among sovereign states is a feasible project, and if it is, how the problems experienced until now can be corrected to prevent a reoccurrence. Examining the necessary criteria for a common currency area to function, will answer if the convergence among factor prices, commodity prices and the business cycles led to a strengthened single market that can cushion the experience of asymmetric shocks or if the convergence has not been strong enough to serve as a stabilizing mechanism.

Answering this requires an identification of the different sources of imbalances, in addition to when they developed. This identification should provide an answer to whether the developed macroeconomic imbalances were: (a) the result of purely domestic sources; (b) the result of domestic difficulties amplified by EMU membership; or (c) the result of these countries joining the EMU, regardless of their domestic state of affairs prior to membership.

To answer these questions, a case study of three EMU member states, namely Spain, Italy and Greece will be conducted. These countries are chosen because they are examples of the southern European economies now facing difficulties with current account deficits, increasing unemployment and low economic growth. They represent the European countries worst affected by the imbalances in the EMU. The case study should provide an answer to whether already suggested measures by the EU institutions, the IMF and others, such as structural reform in the labor market and industry sector or a revision of the EMU's institutional design, are sufficient to achieve recovery and prevent reoccurrence as well as eliminate the risk faced by the southern deficit countries. A revised SGP has been implemented, but will it prevent new problems from reoccurring in the future? Or will it be necessary for the EMU to move towards functioning as a full-scale political union, as in the American system? The insight gained from this investigation should allow a conclusion on how and when the imbalances developed, along with whether the suggested measures will correct the problems experienced until now and hinder reoccurrence.

I will contrast and compare microeconomic, macroeconomic and policy differences between Spain, Italy and Greece by using data from 1992 to 2011. The data will be aggregated into three time periods: period 1, from 1992 to 1998, which is the pre-EMU period when the potential member countries had to follow the convergence criteria of the Maastricht treaty; period 2, from 1999 to 2007, is the core-EMU period when the dynamics between the member states unfold; and period 3 from 2008 to 2011 is the crisis-response period when the member states began addressing EU-wide strategies to recover from the global financial crisis and strengthen the euro collaboration. The relevant data variables for Germany will be included to act as a benchmark, being one of the core economies in EMU, and one that has steered clear of difficulties in the aftermath of the financial crisis. I will primarily use data from the IMF World Economic Outlook database from September 2011 and from Eurostat's statistical database. All 2011 numbers from IMF are staff estimates.

The remainder of this thesis is organized as follows: Chapter 2 describes the background of the imbalances in the euro zone in detail and presents the collected data. Chapter 3 presents the economic theory of an optimal currency area, the costs and benefits from the different fixed exchange rate regimes and how well the EMU fulfills the theoretical criteria. Chapter 4 describes the practical functioning of the EMU, presents the analytical framework for the case study and the suggested solutions to the problems that have arisen. Chapter 5 presents a country-specific case study, and Chapter 6 concludes the thesis.

## 2. Background information and presentation of the data

In this section the sources of internal and external imbalances in the EMU are reported by tables and figures of average macroeconomic and microeconomic variables for Germany, Greece, Italy and Spain. The examination of similarities and differences among the countries will help highlight when the imbalances started to develop, as well as their causes.

### 2.1 The domestic macroeconomic situation

Both internal and external balance is important in open economies. Internal balance refers to full employment of the country's resources and stable domestic prices, while external balance refers to the country's current account balance. The aim of policymakers is to hinder either an overheated economy or recessions, as this can cause variations in the price level. Preventing large fluctuations in the output levels can contribute to reduce the variation in the price level (Krugman and Obstfeld 2006).

The natural level of unemployment can be estimated for each country, while a low and stable inflation is stated by the ECB to be close to but below 2 percent (ECB 2012a). Jaumotte and Sodsriwiboon (2010) argued that a current account deficit should not exceed 6 percent of GDP, but there is no natural benchmark for the optimal current account surplus or deficit.

#### 2.1.1 Causes of internal economic imbalances

The national economy can be described by equation (1). The equation demonstrates the three sources of demand for domestic output,  $Y$ : consumption (C), domestic investment (I), and government consumption (G). The balance of trade is excluded for now to isolate the domestic macroeconomic situation.

$$Y = C + I + G \tag{1}$$

Manipulation of equation (1) establishes that what is not consumed privately or by the government is invested and investments are assumed to equal savings (Blanchard et al. 2010). If the total consumption exceeds total output, money must be borrowed from abroad and investments may decline, hindering the capital accumulation necessary to maintain productivity.

Table 1 presents domestic macroeconomic data on Germany and three deficit countries in southern Europe.

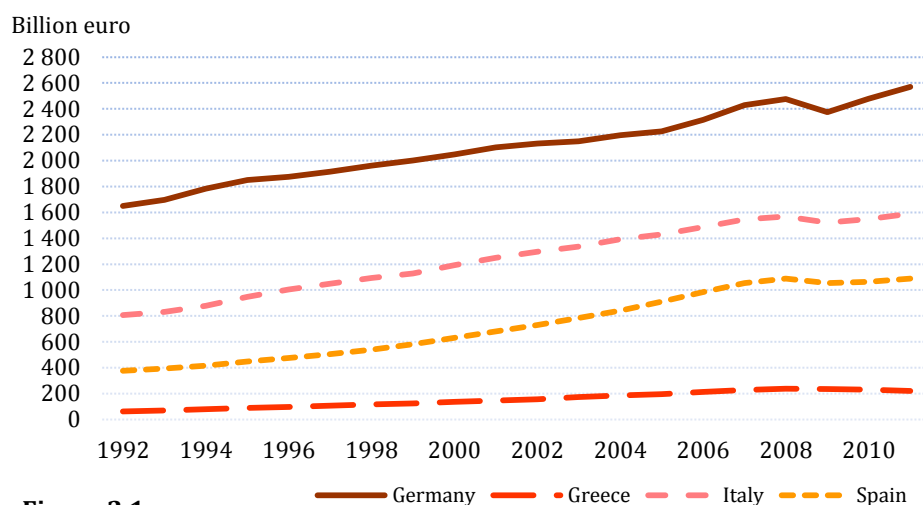
**Table 1****Domestic macroeconomic activity in Germany, Greece, Italy and Spain (1992-2011)**

	1992-1998	1999-2007	2008-2011
<b>GDP in current prices <i>Billion euro</i></b>			
Germany	1817,6	2176,9	2473,3
Greece	87,8	172,6	230,7
Italy	943,5	1338,9	1556,4
Spain	449,6	799,0	1073,0
<b>GDP per capita <i>Current prices in euro</i></b>			
Germany	22 313,8	26 470,5	30 272,5
Greece	8 222,0	15 653,6	20 660,4
Italy	16 596,4	23 176,9	25 873,4
Spain	11 408,5	18 960,8	23 421,0
<b>Annual consumption in current prices <i>euros per person</i></b>			
Germany	17 342,9	20 333,3	23 200,0
Greece (2000-2011)	n.a.	14 225,0	18 550,0
Italy	13 114,0	18 211,0	20 925,0
Spain	9 343,0	14 289,0	18 075,0
<b>Total investment <i>Percent of GDP</i></b>			
Germany	22,1	19,2	18,1
Greece	19,1	22,2	15,9
Italy	19,6	20,9	20,1
Spain	22,0	27,9	24,6
<b>Government gross fixed investment <i>Percent of GDP (1999-2010)</i></b>			
Germany	n.a.	1,7	1,6
Greece	n.a.	3,4	3,2
Italy	n.a.	2,3	2,3
Spain	n.a.	3,5	4,1
<b>Gross business investments <i>Percent of GDP</i></b>			
Germany	19,7	17,4	16,7
Greece (2000-2010)	n.a.	16,3	14,0
Italy	16,7	18,2	17,4
Spain	10,6	24,1	21,1
<b>Government total expenditure <i>Billion euro</i></b>			
Germany	892,5	1020,8	1141,0
Greece	38,1	78,1	115,5
Italy	495,9	640,9	782,4
Spain	195,8	310,2	469,1

Source: IMF, World Economic Outlook 2011 and Eurostat (2012).



## GDP in current prices (1992-2011)



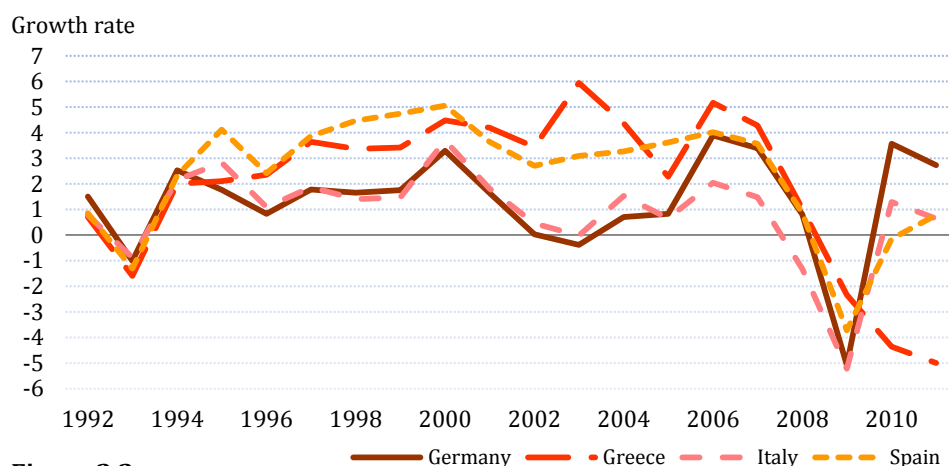
**Figure 2.1**

Source: IMF, World Economic Outlook 2011.

The Greek economy is the smallest of the four, but experienced a quadrupling of the GDP from 1992 to 2008 (figure 2.1). Greece grew more rapidly after joining EMU in 2001. Italy doubled its GDP from 1992 to 2008, and Spain more than doubled its GDP in the same period. Spain grew with excelled speed in the core-EMU period, while Italian nominal growth remained stable after joining EMU. Germany's nominal growth was stable until it experienced a 1.44 percentage point's average increase in the years between 2005 and 2008 compared to the years between 1999 and 2004. There has not been convergence in the southern countries nominal GDP relative to Germany. Figure 2.1 demonstrates how Greece diverged from the other countries in the core-EMU period and that this continued in the crisis-response period. All countries GDP dropped throughout 2009, while all but Greece grew again in 2010. Italian GDP declined sharper than the Spanish GDP, but has picked up quicker.

Figure 2.2 illustrates that all four countries experienced the same growth movements and rates in the beginning of the pre-EMU period. Spain grew the most in the pre-EMU period, followed by Greece. Italian and German growth rates converged and grew at a slower speed than Greece and Spain until 2005 when Italy's growth slowed, while Germany's rate caught up with Spain. The burst of the IT bubble in 2000 affected all four countries. Greek growth picked up the quickest and surpassed Spain in the core-EMU period, until 2003 when its growth rate fell for two subsequent years before it surpassed Spain once more. All countries growth rate fell between 2006 and 2007, and continued into a recession in the crisis-response period. Germany, Italy and Spain have grown at the same rate since 2009, but Greece's declined. Estimated GDP growth for 2012 is negative for all countries except Germany (IMF 2012b).

## GDP in constant prices, percent change (1992-2011)



**Figure 2.2**

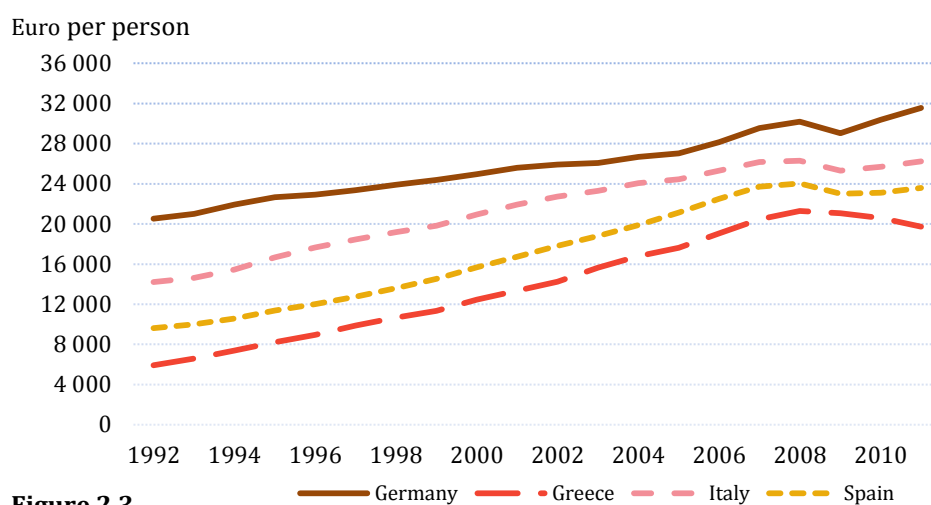
Source: IMF, World Economic Outlook 2011.

Table 1 demonstrates that the Greek GDP per capita has almost doubled, on average, from the pre-EMU to the core-EMU period. Italian per capita GDP increased by 41 percent in the same period, the Spanish by 66 percent, while German GDP per capita only increased by 19 percent. Figure 2.3 illustrates the southern countries GDP per capita converged towards Germany's in the core-EMU period. The figure also demonstrates the divergence that occurred during the crisis-response period. Annual consumption is the next variable in Table 1 and it reveals that the average German consumption growth from the pre-EMU period was 17 percent, Italian growth was 39 percent and Spanish growth was 53 percent. Italian and German consumption grew with 26 and 14 percent, on average, in the crisis response period, while Spanish and Greek consumption grew by 26.5 and 30 percent, respectively.

Investment is measured by the total value of the gross fixed capital formation and changes in inventories and acquisitions less disposals of valuables for a unit or sector (IMF 2011b). Table 1 reports that total investments increased from the pre-EMU period to the core-EMU period for all countries except Germany, while it has dropped for all four countries in the crisis-response period. Greek investments increased by 3 percent relative to GDP in the core-EMU period compared to the previous period. The investment climate has deteriorated since and especially after the financial crisis. Italian investment levels held steady between 18 and 22 percent of GDP over the three aggregated periods. Spanish investments rose by 6 percent in the core-EMU period compared to the pre-EMU period, the largest increase of the four countries.

Government fixed investments declined in Germany and Greece in the crisis-response period, but remained at the same level, on average, in Italy, and increased in Spain. Greece

## GDP per capita in current prices (1992-2011)



**Figure 2.3**

Source: IMF, World Economic Outlook 2011.

and Spain had the highest share of government investments. Gross business investments declined in Germany in all periods. In Italy and Spain, it increased from the pre-EMU to the core-EMU period, but it increased by 127 percent, on average, in Spain compared to a 9 percent increase in Italy. Greek business investments were the lowest of the four countries in the core-EMU period, as well as in the crisis-response period. Business investments declined in all countries in the crisis-response period.

Government expenditure in Table 1 consists of total expenses and net acquisition of nonfinancial assets (IMF 2011b). Greece has the lowest nominal government expenditures of the four countries, but the expenditures have tripled since before they joined EMU. The government expenditure has more than doubled in Spain since they joined EMU and until after the financial crisis. Italy and Germany's expenditures have increased more moderately.

Table 2 displays the four countries' composition of GDP. Gross value added is the value of all newly generated goods and services less the value of all goods and services consumed as intermediate consumption and is compiled according to the industry that created it, not accounting for the depreciation of fixed assets (Eurostat 2012). Greece has the largest share of agriculture, hunting and fishing sector of the four countries; however the share has declined from the core-EMU period to the crisis-response period. The same is true for the other three countries, where Germany has the smallest share followed by Italy and Spain, respectively.

The Greek industrial sector contributes the least to GDP out of the four countries, while Germany has the largest share, with the industrial sector accounting for one fourth of their GDP. Italy has the second largest industrial share of GDP and Spain the third largest. All countries' contribution from industry has declined slightly in the crisis-response period,

**Table 2**  
**Gross value added to GDP by sector in Germany, Greece, Italy and Spain**  
**(2000-2010), % of total GDP**

	2000-2007	2008-2010
<b>(1) Agriculture, hunting and fishing</b>		
Germany	1,1	0,9
Greece	5,2	3,2
Italy	2,4	1,9
Spain	3,7	2,7
<b>(2) Industry, including energy</b>		
Germany	25,4	24,0
Greece	12,9	13,7
Italy	21,7	19,6
Spain	18,9	16,1
<b>(3) Construction</b>		
Germany	4,4	4,2
Greece	6,8	4,6
Italy	5,6	6,1
Spain	10,3	10,8
<b>(4) Trade, transport and communication services</b>		
Germany	17,9	17,6
Greece	33,2	34,2
Italy	23,3	22,1
Spain	25,6	24,9
<b>(5) Business activities and financial services</b>		
Germany	29,0	30,6
Greece	19,7	20,1
Italy	26,0	28,0
Spain	20,8	23,2
<b>(6) Other services</b>		
Germany	22,9	23,5
Greece	22,8	26,0
Italy	20,4	21,7
Spain	20,7	22,9

Note: Greek percentage numbers are based on provisional values. Source: Eurostat (2012).

except for Greece. Spain experienced the largest decline, followed by Italy.

The Spanish GDP share of construction activity is about 10 percent. This is the largest share of the four countries and it increased slightly after 2007, on average. Italian construction activity was low in the core-EMU period, but it also increased slightly after 2007. Construction activity has decreased in Greece after the financial crisis and while previously it had the second largest share contribution from construction, this standing has now been taken

over by Italy. Construction activity in Germany contributes the least to GDP of the four countries and declined in the crisis-response period.

The trade, transport and communication services sector share of Greek GDP amounts to almost 35 percent, having increased in the crisis-response period. This is the largest share of the four countries and the single largest contribution to Greek GDP. Italy and Spain’s share is about 25 percent, while Germany’s share is close to 18 percent. A slight decrease has occurred in this sector for these three countries in the crisis-response period.

The contribution from business activity and financial services accounts for 20 percent in Greece, while Spain’s share is 23 percent. This sector is the largest single contribution to both Italy and Germany’s GDP and Germany’s share is the largest of the four countries. The share has increased in all four countries from the core-EMU period to the crisis-response period. The other services sector accounts for close to one fourth of all countries’ GDP and has increased for all countries in the crisis-response period. Aggregating the three service sectors demonstrates how 80 percent of Greece’s GDP and about 70 percent of Germany, Italy and Spain’s GDP originates from these sectors.

**2.2 The development of imbalances in EMU**

**2.2.1 Causes of external economic imbalances**

The balance of payments (BOP) is the record of all transactions between a country and the rest of the world, and consists of the current account, including the balance of trade (BOT), the capital account and the central bank’s reserves. All the components of the BOP must sum to zero, as figure 2.4 demonstrates.

<b>THE BALANCE OF PAYMENTS</b>	<b>+ Private capital account</b>
Merchandise trade	Direct investment
<i>Exports of goods</i>	Portfolio capital
- <i>Imports of goods</i>	<i>Equity flows</i>
<b>= Trade balance</b>	<i>Bond flows</i>
+ Services	<i>Long-term bank debt</i>
<i>Tourism</i>	<b>= Basic balance</b>
<i>Transport</i>	+ Short-term capital flows
<i>Professional and other services</i>	<b>= Balance of payments</b>
<b>= Goods-and-services balance</b>	<b>+ Official reserve transactions</b>
+ Interest and other investment income	Changes in foreign central bank's
+ Unilateral transfers	holdings of domestic currency
<b>= Current-account balance</b>	Changes in domestic central bank's
	holdings of foreign assets
	<i>(including gold, foreign-exchange reserves)</i>
	<b>= 0</b>

**Figure 2.4 The BOP**  
Source: *The Economist* (Sep 18, 2003).

A country's current account is the record of transactions of goods and services, interest payments on loans and remitted profits from assets abroad. The account measures how much money flows in to the country from foreign sources compared to how much flows out from domestic sources, and is therefore the difference between domestic saving and domestic investment. A surplus or deficit reflects the discrepancy between these variables. The current account is a function of the real exchange rate, the level of foreign expenditure and disposable income (Krugman and Obstfeld 2006).

A country has a trade deficit when the value of its imports of goods and services exceeds the value of its exports over a specified period. This can be caused by quicker domestic demand growth than foreign demand for domestically produced goods, decreased domestic savings, or deterioration of competitive powers relative to the country's trade partners (Blanchard et al. 2010). Figure 2.4 illustrates that a trade deficit can lead to a current account deficit if positive net factor income or positive net cash transfers do not offset the discrepancy between exports and imports. A decrease in domestic savings, increase in total investments, or an increase in the government budget deficit are other sources causing a current account deficit (Kenen 2000). It follows that the opposite is true for a current account surplus. Countries can neutralize the effect of a current account deficit by capital inflows if it borrows or receives investments from abroad, and by using central bank reserves. This will ensure that the BOP sums to zero.

Equation (2) examines the relationship between private savings ( $S^P$ ), investment ( $I$ ), government expenditures ( $G$ ), and government income from taxes ( $T$ ), in relation to a country's balance of trade.

$$BOT = X - M = (S^P - I) - (G - T) \quad (2)$$

A trade surplus must correspond to an excess of savings over time; a trade deficit must correspond to an excess of investment over saving (Blanchard et al. 2010). Increased investments must originate from increased private or public savings, unless a deterioration of the trade balance has occurred. An increase in the budget deficit must come from an increase in private saving or a decrease in investment, otherwise the trade balance will deteriorate. It follows that a country with a high saving rate must have either a high investment rate or a large trade surplus.

### ***2.2.2 Domestic activity in an open economy***

Table 3 examines the countries' indicators for the variables presented in equation (2). Government revenue consists of taxes, social contributions, receivable grants, and other revenue. Table 3 demonstrates that government total expenditures in the four countries exceeded revenues in all periods, except for Spain in the core-EMU period.

The structural budget balance in Table 3 demonstrates the general government cyclical balance adjusted for non-structural elements beyond the economic cycle. These include temporary financial sector and asset price movements, and one-time or temporary revenue and expenditure items (Eurostat 2012). Germany and Greece increased their nominal deficits from the pre-EMU period to the core-EMU period, while Italy and Spain decreased their deficit. The Greek deficit nearly tripled, on average, from the core-EMU period to the crisis-response period, while Spain's deficit increased sevenfold during that same time. Italy decreased its deficit slightly, on average, in the same period; the corresponding German decrease equals two thirds. Following the mechanics of equation (2), Germany and Greece's BOT should have worsened in the core-EMU period as their deficit grew, while the opposite should have occurred in Italy and Spain. However, it is the deficit relative to GDP that is emphasized in the SGP. Figure 2.5 illustrates how all three southern countries strived to meet the Maastricht deficit criterion prior to joining EMU. They all had a deficit below 3 percent when they joined, but only Spain maintained it throughout the core-EMU period. The Spanish deficit quickly deteriorated after the financial crisis, reaching 9 percent in 2009, but has improved since. The countries' balances improved in 2010 and 2011. Greece violated the 3 percent ceiling after joining EMU, but improved its deficit between 2004 and 2005. After that, the deficit increased steadily until it reached 18.5 percent in 2009. Italy's deficit declined after joining and reached 5 percent of GDP in 2003, but the country improved its deficit between 2004 and 2007 and complied with the SGP between 2007 and 2011, except in 2009. Germany violated the 3 percent deficit criterion between 2002 and 2004, but improved the deficit every following year, until the country violated it again in 2009 and 2010. The results displayed in figure 2.5 modify the expectation of a worsened BOT in the core-EMU period for Germany but strengthens the expectation for Greece. Spain continues to be expected to improve its BOT in the core-EMU period, while Italy is expected to experience a worsened BOT before the improvement of the deficit occurred late in the core-EMU period. However, a further examining of equation (2) will be conducted later in this section.

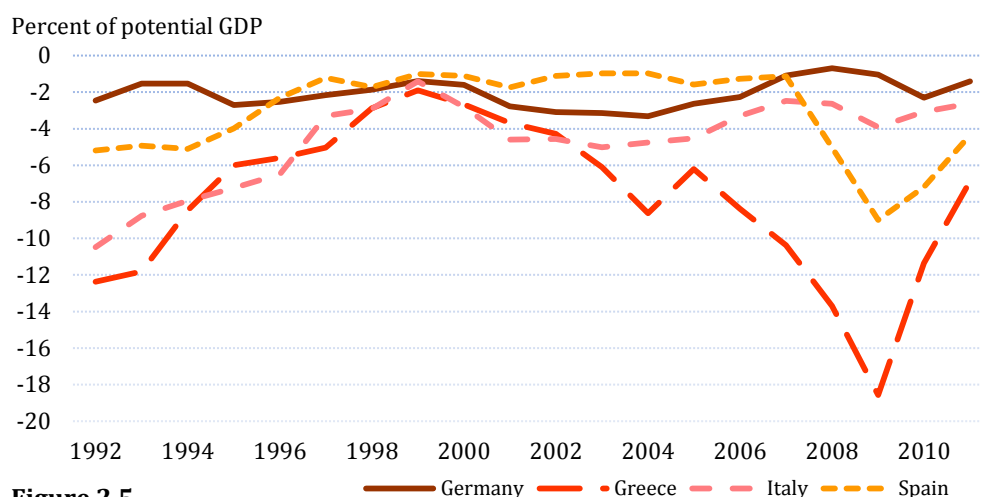
**Table 3**  
**Domestic activity in an open economy in Greece, Italy and Spain (1992-2011)**

	1992-1998	1999-2007	2008-2011
<b>Government revenue <i>Billion euro</i></b>			
Germany	825,5	974,3	1092,4
Greece	31,5	68,7	90,1
Italy	431,8	603,1	718,3
Spain	174,1	312,6	387,3
<b>Government total expenditure <i>Billion euro</i></b>			
Germany	892,5	1020,8	1141,0
Greece	38,1	78,1	115,5
Italy	495,9	640,9	782,4
Spain	195,8	310,2	469,1
<b>Government structural balance <i>Billion euro</i></b>			
Germany	-39,0	-51,6	-34,3
Greece	-6,1	-10,5	-28,2
Italy	-61,5	-50,0	-49,0
Spain	-15,0	-9,6	-69,7
<b>Government gross debt <i>Billion euro</i></b>			
Germany	968,1	1389,7	1901,6
Greece	85,3	176,5	313,8
Italy	1104,8	1427,8	1799,4
Spain	273,6	380,8	591,7
<b>Total investment <i>Percent of GDP</i></b>			
Germany	22,1	19,2	18,1
Greece	19,1	22,2	15,9
Italy	19,6	20,9	20,1
Spain	22,0	27,9	24,6
<b>Gross savings <i>Percent of GDP</i></b>			
Germany	21,2	21,9	23,7
Greece	17,0	14,2	4,8
Italy	20,9	19,8	17,1
Spain	20,9	22,5	18,8
<b>Gross household saving rate <i>Percent of disposable income (1995-2010)</i></b>			
Germany	16,2	15,9	17,2
Greece	n.a.	n.a.	n.a.
Italy	20,3	15,9	13,9
Spain (2000-2010)	n.a.	11,0	15,3
<b>Private sector credit flow <i>Percent of GDP (1995-2010)</i></b>			
Germany	5,3	3,3	2,7
Greece	4,4	11,6	6,2
Italy	3,5	8,4	4,2
Spain	7,4	21,0	3,5
<b>Households gross debt-to-income ratio <i>Percent</i></b>			
Germany	n.a.	102,0	90,1
Greece	n.a.	n.a.	n.a.
Italy	n.a.	42,2	61,9
Spain	n.a.	96,5	126,7
<b>Non-financial firms net debt-to-income ratio <i>Percent</i></b>			
Germany	n.a.	198,2	178,9
Greece	n.a.	n.a.	n.a.
Italy	n.a.	384,0	673,3
Spain	n.a.	967,9	1513,4

Source: IMF, World Economic Outlook 2011 and Eurostat (2012).



## Government structural balance (1992-2011)



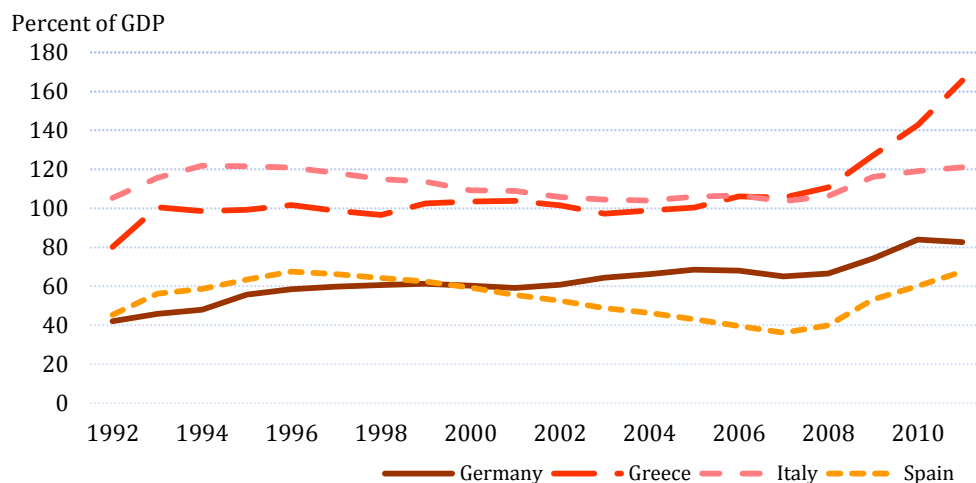
**Figure 2.5**

Source: IMF, World Economic Outlook 2011.

Gross debt consists of all liabilities that require payment of interest and principal by the debtor to the creditor at a date in the future (IMF 2011b). Table 3 demonstrates that the Greek debt is nominally very small compared to the Italian and German debt, and approximately half the size of the Spanish debt, which is also nominally low. The Greek debt doubled from the pre-EMU period to the core period and almost doubled again in the crisis-response period. Italian debt increased by 29 percent, on average, from the pre-EMU period to the core-EMU period and by 26 percent from the core period to the crisis-response period, resulting in largest nominal debt of the southern countries. German and Spanish debt almost doubled, on average, from the pre-EMU period to the crisis-response period.

Figure 2.6 illustrates that Greece and Italy had a debt-to-GDP ratio above 100 percent prior to joining EMU and did not meet the Maastricht criterion before they joined. Greek debt-to-GDP remained close to 100 percent in the core-EMU period, while the Italian debt declined until 2004. As Greece's GDP growth was high in the core-EMU period, the non-declining debt illustrates lack of prioritized debt reduction. On the contrary, Italy's lower GDP growth in the core-EMU period coincides with declining debt and illustrates effort to reduce the debt-to-GDP ratio. Greek debt increased by 60 percentage points, on average, from 2007 to 2011, which is the quickest growth out of the four countries in the crisis-response period. Italian debt increased by 15 percentage points, on average, in the same period. Germany complied with the SGP in the pre-EMU period, but its debt crossed the 60 percent mark in 2002 and has remained above the mark despite a decline at the end of the pre-EMU period. Spain's debt declined in the core-EMU period and complied with the SGP criterion throughout that period, until the debt increased by 55 percent, on average, in the core-EMU period. The country's

## Government gross debt (1992-2011)



**Figure 2.6**

Source: IMF, World Economic Outlook 2011.

relative debt level is the lowest of the four, combined with the low deficit in the core-EMU period, and indicate increased public saving.

That Germany surpassed both the deficit and debt threshold in the core-EMU period and that Italy and Greece surpassed the deficit threshold in the core-EMU period as well confirms that these countries did not comply with the SGP rules during that same period. However, the above examination serves to answer that the internal imbalances in Italy and Greece, with a high  $G$ , and a high  $(G-T)$ , combined with a high government debt, had developed prior to the countries' EMU membership. Spain had a larger than 3 percent deficit at the beginning of the pre-EMU period, as well as a debt above 60 percent in the midpoint of the pre-EMU period. Still, the deficit or debt was never near the Greek and Italian level and this serves to prove that these domestic imbalances in Spain started after the EMU membership.

Total investments increased between the pre-EMU period and the core-EMU period for all countries except Germany, while it dropped for all countries in the crisis-response period. Table 4 decomposes investments and will be presented after the review of Table 3.

Gross national saving is gross disposable income less final consumption expenditure after taking account of an adjustment for pension funds (IMF 2011b). Examination of the aggregated Greek savings data in Table 3 reveals an average decline of 3 percent in the core-EMU period and a drastic decline after the financial crisis, consistent with an expected capital flight. Italian savings did not change greatly after they joined EMU, but declined by 3 percent in the crisis-response period. The Spanish savings level increased slightly in the core EMU-period and declined after the crisis. German gross savings increased slightly from each period to the next. Table 1 confirmed that Greece, Italy and Spain had a higher consumption growth

than Germany between all periods. The decline in Greek gross saving combined with increased investments and increased government deficit in the core-EMU period further strengthens the expectation of a declining BOT. Combined with increased consumption the capital inflow is expected to have increased to allow growth in both government and private consumption. However, data on household saving is available for Germany, Italy and Spain, allowing a more detailed investigation.

The gross saving rate of households is defined as gross savings divided by gross disposable income, with the latter being adjusted for the change in the net equity of households in pension funds reserves (Eurostat 2012). The household saving rate for Germany has been stable over the sample period, but declined slightly in the core-EMU period. The declining investment in Germany during the core-EMU period combined with a minor increase in gross savings contradicts the previously expected deterioration of the BOT and leaves the total effect ambiguous when keeping equation (2) in mind. In Italy, the household saving rate declined by 4.4 percentage points on the average between the pre-EMU and the core-EMU period and it declined further in the crisis-response period, strengthening the previous expectation of a deteriorating BOT in the core-EMU period. The Spanish household saving rate in the core-EMU period was the lowest of all four countries, but it increased and surpassed Italy in the crisis-response period. The saving rate in the pre-EMU period was not available. However, the low rate in the core-EMU period combined with the large investments suggests, despite positive gross savings during the same period, that the country experienced a deterioration of their BOT. Both the size of the Spanish investment and of the FDI from ROW in the core-EMU period supports the impression that the country has borrowed from abroad.

The examination of household savings and investment in Table 3 fulfills the investigation of equation (2), and support that Italy developed an internal imbalance in the core-EMU period as the household saving rate fell; the same is true for Greece. In Spain, a large gap between investment and private savings is shown in the core-EMU period. Germany, on the other, hand has had an excess of gross savings in the core-EMU period. These internal imbalances explain the external imbalances.

The annual private sector credit flow is the net amount of liabilities incurred by households, non-profit institutions serving households and non-financial corporations (Eurostat 2012). The annual private credit flow in Germany has decreased over the sample period and was at the lowest average number in both the core-EMU and the crisis-response period. Greece was at a low level in the pre-EMU period, but more than doubled, on average,

the private credit flow in the core-EMU period. The level has declined in the crisis-response period, but it is the highest of the four countries. Italy was at the lowest level in the pre-EMU period and also more than doubled, on average, in the core-EMU period but declined after the financial crisis. Spain had the highest level of private credit flow prior to joining EMU and experienced close to a threefold increase, on average, in the core-EMU period. After the crisis, the level has declined to the lowest of the four countries.

Gross debt-to-income ratio of households is defined as liabilities divided by gross disposable income (Eurostat 2012). The ratio can increase if debt rises or if income drops. Table 3 establishes that household debt was high in Spain in the core-EMU period and the debt-to-income ratio increased by 31 percent, on average, after the crisis. Italian household debt-to-income ratio was half the size of the Spanish ratio in the core-EMU period. It increased by 47 percent, on average, after the crisis. The contraction in the economy after the financial crisis increased unemployment and decreased the aggregated income of households. The largest share of household wealth is in the value of their home and if this value declines, household wealth also declines, decreasing the level of disposable income (Lane 2006). However, households normally need to borrow from local banks to purchase a home. Both the above mentioned effects increase the debt-to-income ratio, resulting in a weakened debt serving ability. Households in Spain had more debt than those in Italy and were thus more vulnerable to a decline in asset values after the financial crisis. If the number of households surpasses a certain unknown threshold, the banking sector is left vulnerable. The above figures indicate that the Spanish banking sector has been affected to a larger extent than the Italian sector, as the overall exposure of household debt is twice as large in Spain during the crisis-response period.

Net debt-to-income ratio, after taxes, of non-financial corporations is defined as main financial liabilities divided by net entrepreneurial income less current taxes on income and wealth (Eurostat 2012). The debt-to-income ratio for non-financial corporations has increased by 93 percent from the core-EU period to the crisis-response period in Italy. This illustrates that the decline in income after the financial crisis lowered the Italian corporations' debt serving ability, enhancing the number of losses incurred by the Italian banking sector on loans issued to these firms. In Spain, it increased by 56 percent between the same periods. As previously shown, the construction share of Spain's GDP was above ten percent and when the financial crisis hit and the housing market stalled, activity in this sector was greatly affected. The income of these non-financial corporations in Spain declined, lessening their debt serving ability. This further contributed to weakening the Spanish banking sector.

**Table 4**  
**Investment flows in Germany, Greece, Italy and Spain (1992-2010)**

	1992-1998	1999-2007	2008-2010
<b>Inward foreign investment from ROW Percent of GDP</b>			
Germany	0,7	2,7	0,9
Greece (2000-2001 and 2004-2010)	n.a.	0,7	0,7
Italy	0,3	1,3	0,3
Spain	1,5	3,9	2,4
<b>Intra-EU direct investment abroad by the reporting country Million euro (2001-2010)</b>			
Germany	n.a.	28 515,7	47 495,0
Greece	n.a.	202,6	810,7
Italy	n.a.	22 082,4	16 448,7
Spain	n.a.	31 212,0	8 455,3
<b>Intra-EU direct investment in the reporting economy Million euro (2001-2010)</b>			
Germany	n.a.	25 894,4	19 655,4
Greece	n.a.	2 750,0	1 849,8
Italy	n.a.	18 172,2	4 227,3
Spain	n.a.	24 634,7	22 339,2

Source: Eurostat (2012).

Table 4 decomposes the investment flows among the sample countries. Foreign direct investment is the net inflows of investment to an economy other than that of the investor, and is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments (Eurostat 2012). Foreign investments from the rest of the world (ROW) relative to GDP increased by 2 percentage points, on average, in Germany between the pre-EMU period and the core-EMU period, but declined by almost the same amount in the crisis-response period. Inward foreign investments to Greece were stable between the core-EMU period and the crisis-response period. It had the lowest share of foreign investments in the core-EMU period out of the four countries. Italian foreign investments relative to GDP increased by 1 percentage point, on average, between the pre-EMU and core-EMU period. This share declined to the pre-EMU level in the crisis-response period. Spain had the highest foreign investments relative to GDP of the four countries prior to joining EMU; the share increased by 2.4 percentage points, on average, in the core-EMU period. The inward foreign investments declined in the crisis-response period. Nevertheless, it remains at a level more than twice as high as the German level and well above the other countries. A decomposition of the countries' current accounts will be undertaken in section 2.2.3 to identify whether the capital inflow were long-term or short-term, i.e. the degree of inward FDI relative to portfolio investments.

Table 4 demonstrates the intra-EU investment flows. Greek investment abroad has quadrupled from the core to crisis-response period. This indicates increasing integration with the EU. Germany has increased intra-EU investments abroad in the crisis-response period relative to the core-EMU period, while Italy and Spain have reduced their intra-EU investments abroad in that same period. Intra-EU inward direct investments decreased in all countries from the core period to the crisis-response period. Most striking is the average decrease in Italy and Greece by 77 and 49 percent, respectively.

### ***2.2.3 The trade balance***

Merchandise trade consists of manufactures and primary products (WTO 2012). Trade in services can be divided into commercial services, investment income and government services (Appleyard et al. 2008). Commercial services in Table 5 exclude government services. The service sector accounts for 20 percent of intra-EU trade, according to Trichet (2011), while Table 2 established that the services share of GDP is above 70 percent for all the countries.

Table 5 illustrates that Germany exceeded the southern countries in total value of both export and import of goods and services in all periods, but that Germany have a deficit in the service trade. Figure 2.7 demonstrates how the German trade surplus tripled in the core-EMU period and declined moderately after the crisis. Italy surpassed Greece and Spain in merchandise exports and experienced a trade surplus of goods in the pre-EMU period until 2004, as well as a surplus in the services trade until 2002. Italy has been running a trade deficit since 2004, but it is the smallest deficit of the three southern countries. The Italian BOT surplus starts to decline after 1996 and moved into the negative in 2004. Italy has not been able to generate an overall surplus after its EMU membership. Greece displays an increasing gap between its merchandise exports and imports over the three periods, but it has exported twice as much as it imported in the services trade. The value of merchandise trade dominates, leaving the balance of trade negative. This deficit grew in the core-EMU period, but declined in the crisis-response period. Spain had a surplus in the services trade and a deficit with goods in all three periods; however, the value of merchandise exports is larger than the value of service exports resulting in a negative Spanish trade balance for all three periods. The trade balance deteriorated severely in the core-EMU period. Spain has been able to halve the deficit after the financial crisis.

The above mentioned developments confirms the predictions made in section 2.2.2 for the core-EMU period of a deterioration of the BOT for the southern countries, and removed

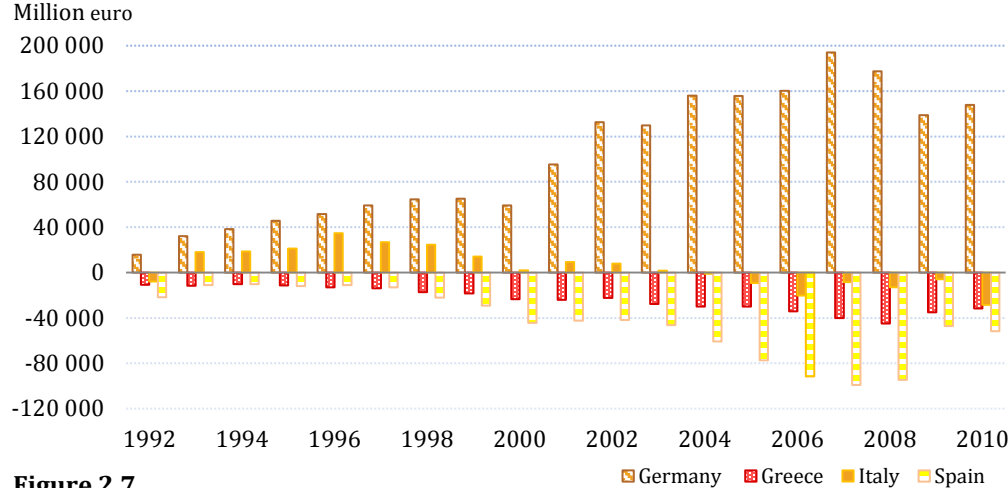
**Table 5****Trade balance in Germany, Greece, Italy and Spain (1992-2010)**

	1992-1998	1999-2007	2008-2010
<b>Exports and imports in billion dollars in current prices</b>			
<b>Merchandise exports to ROW</b>			
Germany	477,4	816,1	1278,4
Greece	10,3	15,0	22,8
Italy	215,9	324,2	465,7
Spain	89,1	162,3	251,5
<b>Merchandise imports from ROW</b>			
Germany	424,7	667,4	1059,4
Greece	25,4	46,9	75,1
Italy	192,7	326,1	486,9
Spain	107,6	231,7	342,8
<b>Commercial services exports to ROW</b>			
Germany	68,7	129,7	238,0
Greece	9,1	27,2	41,3
Italy	60,2	75,7	101,9
Spain	38,9	78,3	128,8
<b>Commercial services imports from ROW</b>			
Germany	118,0	179,9	266,9
Greece	3,9	12,7	21,0
Italy	55,5	76,4	114,1
Spain	22,4	53,8	92,4
<b>Overall balance of trade <i>Billion euro</i></b>			
Germany	43,8	127,7	154,8
Greece	-12,6	-27,8	-37,3
Italy	19,4	-0,6	-15,8
Spain	-14,5	-59,2	-64,6
<b>Intra-EU balance of trade <i>Billion euro</i></b>			
Germany	25,2	79,0	90,2
Greece	-10,0	-16,1	-20,5
Italy	10,0	1,7	3,1
Spain	-9,0	-29,4	-27,7
<b>Overall current account <i>Billion euro</i></b>			
Germany	-16,7	62,9	130,7
Greece	-2,3	-14,4	-27,9
Italy	14,0	-15,5	-43,1
Spain	-5,2	-47,2	-69,2
<b>Average value of imports and exports of goods divided by GDP <i>Percent</i></b>			
Germany	20,1	29,7	35,4
Greece (1995-2010)	10,5	14,7	15,0
Italy	17,1	20,8	21,7
Spain (1993-2010)	18,0	21,6	19,9

Sources: Merchandise and service trade from WTO Statistical database (2012), the BOT and current account from Eurostat (2012) and intra-EU BOT from Eurostat Statistical Yearbook (2008) and (2010).

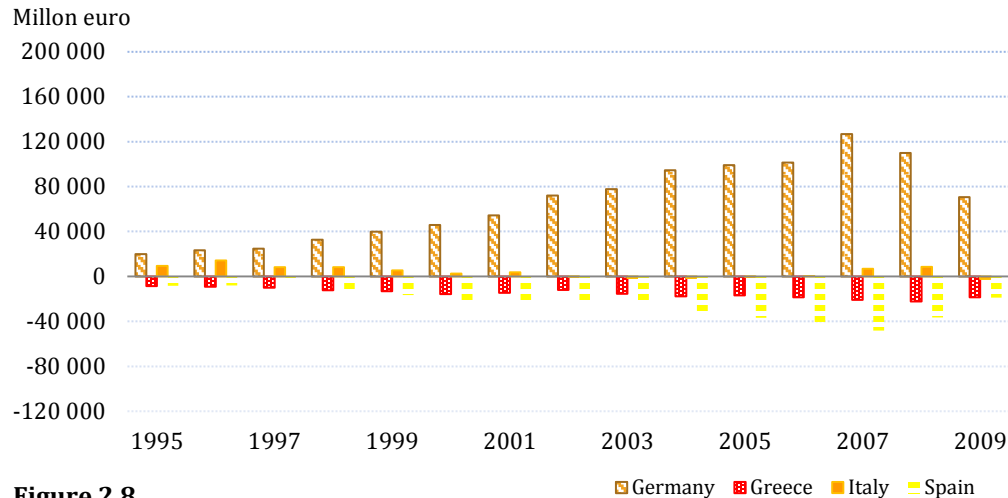
ambiguity regarding which effect would dominate in Germany. The intra-EU BOT is displayed in figure 2.8. Here, the same pattern as the overall BOT is displayed for Germany, revealing a significant growth in value of the intra-EU. Italy's BOT moved to the positive in 2006 and remained so until 2008, as the reduced fiscal deficit at the end of the core-EMU period predicted. Greece developed a larger BOT deficit in trade with other EU members over the whole period, but an improvement was made between 2008 and 2009. Spain followed the same pattern as Greece, but improvement to the deficit took place one year earlier. The coinciding of Greece, Italy and Spain's worsened intra-EU BOT with their membership suggests that the joining of EMU could have contributed to the deficit.

**Overall trade balance (1992-2010)**



**Figure 2.7**  
Source: Eurostat (2012).

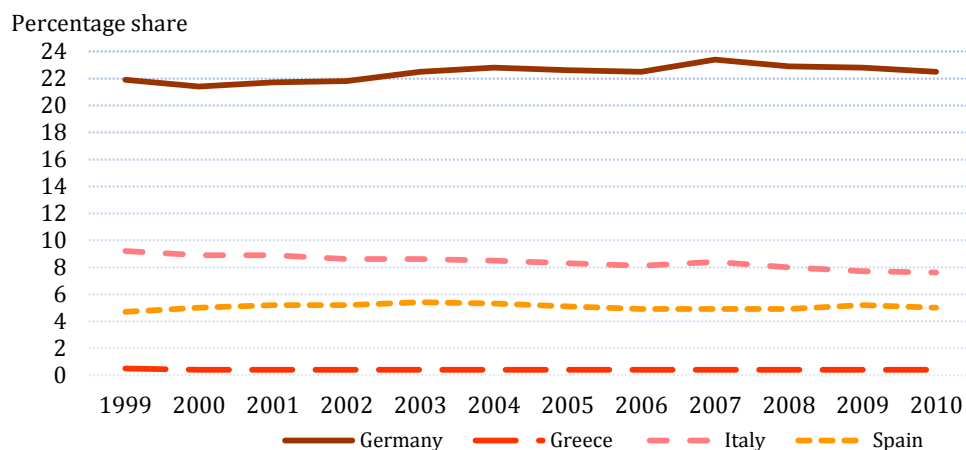
**Intra-EU trade balance (1995-2009)**



**Figure 2.8**  
Intra-EU 25 trade between 1995 and 2001, intra-EU 27 trade between 2002 and 2009.  
Source: Eurostat Statistical Yearbook (2008) and (2010).

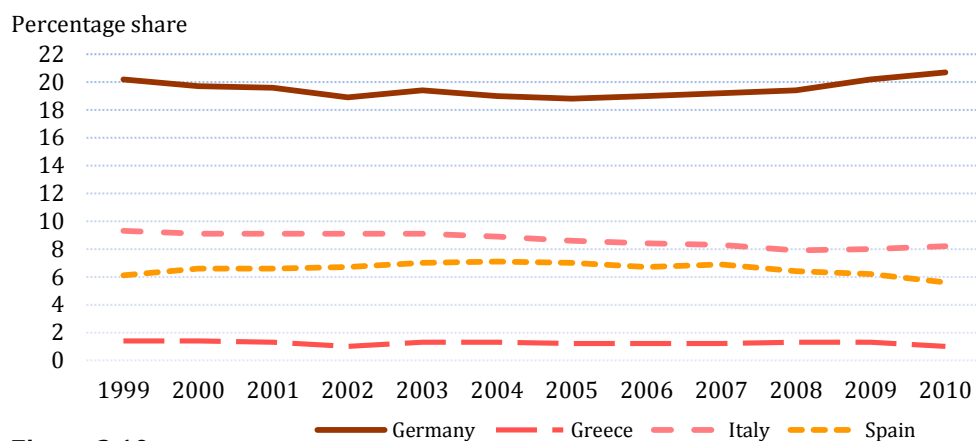


### Share of intra-EU exports (1999-2010)



**Figure 2.9**  
Source: Eurostat (2012).

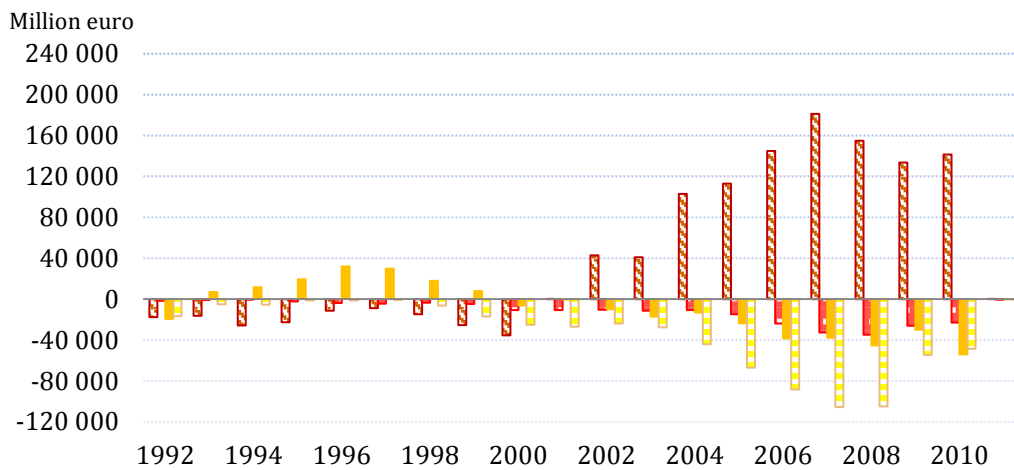
### Share of intra-EU imports (1999-2010)



**Figure 2.10**  
Source: Eurostat (2012).

There has been no change in the share of Greek intra-EU exports between 1999 and 2010 (figure 2.9). Its share of intra-EU imports has also been stable (figure 2.10). The Greek contribution to intra-EU trade is only 0.4 percent and its share of intra-EU imports is 1.4 percent. The German share of exports accounts for 22.4 percent, on average, between 1999 and 2010. This share increased in the core-EMU period, but declined in the crisis-response period. German's imports share declined in the core-EMU period, but increased after the crisis and accounts for 19.5 percent, on average, of intra-EU imports in same time period. Italy's share of both exports and imports displays a downward trend and declined by 1.6 and 1.1 percentage points respectively between 1999 and 2010. Spain's exports share decreased slightly during the core-EMU period but the country regained its lost share in the crisis-response period. Spain's import share increased by almost 1 percentage point between the

## Overall current account balance (1992-2010)



**Figure 2.11**

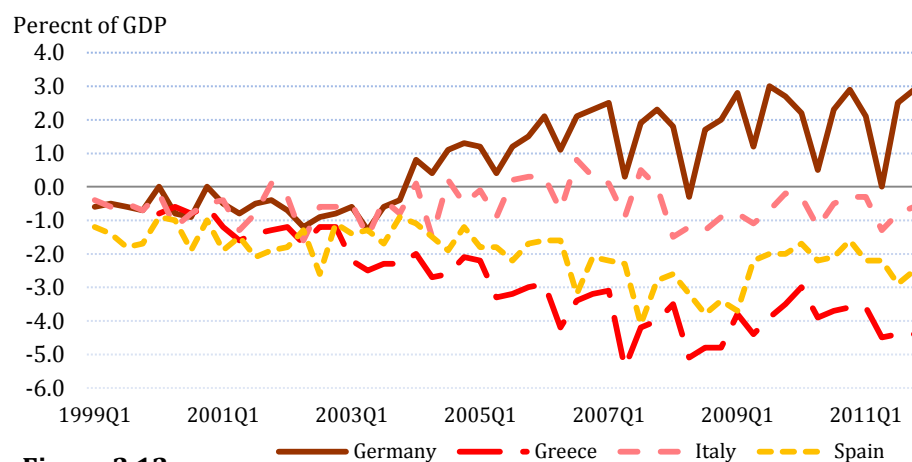
Source: IMF, World Economic Outlook 2011.

pre-EMU and the core-EMU period but this increase reversed after the crisis and Spain's share of intra-EU imports declined below its pre-EMU level.

When Greece joined EMU in 2001, its current account against all trading partners, inside and outside EMU, was already negative. It improved until 2004, at which time it deteriorated significantly and only improved in the crisis-response period. Germany had a current account deficit prior to joining EMU, but this changed in 2001 after which the country has experienced a significant surplus. Italy had a positive current account prior to joining EMU, but it moved into the negative after joining. Their deficit increased in the crisis-response period, especially between 2008 and 2009. Spain's current account was in balance prior to joining EMU, but it moved into the negative following its membership. The Spanish deficit improved between 2000 and 2003, followed by deterioration until 2007, after which it improved during the crisis-response period.

Figure 2.12 illustrates that net income from ROW as percentage of GDP in Germany changed from negative to positive in 2004 and remained so until 2011. Greece and Spain's net income was negative from their entrance into the EMU, but Greece's net income declined earlier and further than Spain's. Both countries improved their net income after 2007. Italy's net income was negative at the start of the core-EMU period, but improved in 2004 until it moved into the negative in the crisis-response period. Figure 2.13 demonstrates that Greece was a net recipient of transfers during this entire time period, while Spain only received transfers in the first five years after admittance. Germany and Italy have been net contributors of transfers throughout their membership.

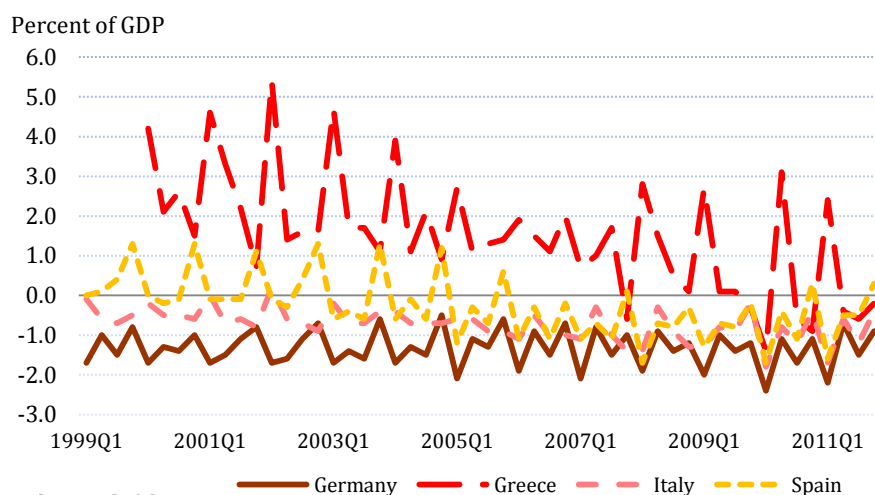
### Net current account income from ROW (1999-2011)



**Figure 2.12**

Source: Eurostat (2012).

### Net current transfers from ROW (1999-2011)

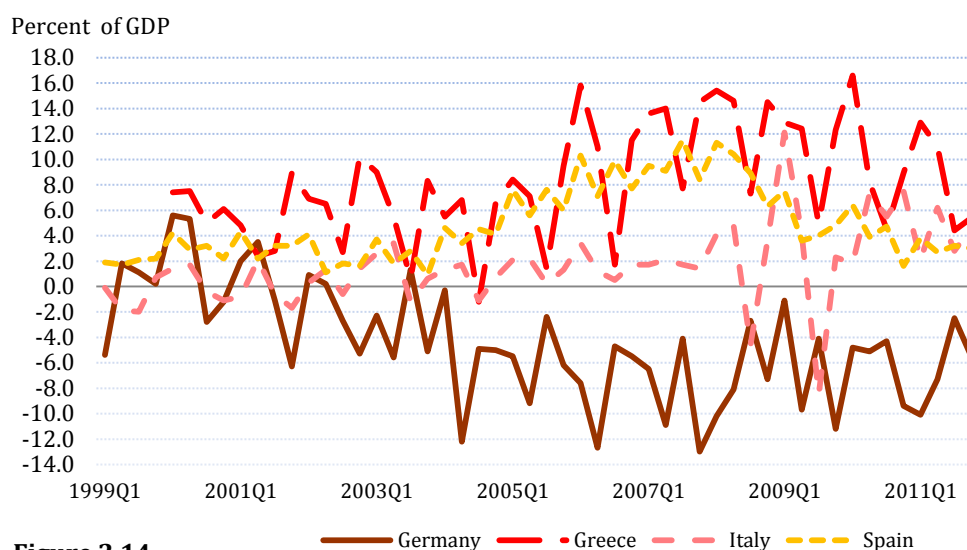


**Figure 2.13**

Source: Eurostat (2012).

Portfolio investment covers transactions in equities, other securities, and financial derivatives, except where these transactions relate to direct investment or reserve assets category. Most important are shares and other equities, bonds and money market instruments (Eurostat 2012). Figure 2.14 demonstrates that Germany was a net exporter of capital during the whole time period, while Greece and Spain were net recipients. Italy was close to balance until after the financial crisis, when the situation became more volatile and it is now a net recipient since 2009. This examination shows that the southern countries did not receive enough net factor income from interest or other investments abroad to offset the deficit on the trade balance, leading to a current account deficit. This means the capital account has been positive in the countries receiving direct investments, portfolio capital and short-term capital inflow to facilitate a BOP equal to zero. Figure 2.7, 2.8 and 2.11 show that the imbalance has

## Net financial account with ROW (1999-2011)



**Figure 2.14**  
Source: Eurostat (2012).

been addressed in the crisis-response period through fiscal consolidation, helped by lower import demand.

The final variable in Table 5 is an index that measures trade integration of goods and services as a percentage of GDP. The index is calculated by the average value of imports and exports of goods and services divided by GDP. If the index increases over time it means the country becomes more integrated with the international economy (Eurostat 2012). All four countries experienced an increase from period to period, except Spain, who did not experience an increase between the core-EMU and the crisis-response period. Greece started as the least integrated of the four countries, increasing by 40 percent, on average, from the pre-EMU to the core-EMU period. Italy increased by 22 percent, on average, in the corresponding period, while Spain increased by 36 percent on average. Germany started at the highest level of integration and increased by 48 percent in the pre-EMU to the core-EMU period. Germany outpaced the southern countries, not allowing any real convergence to take place among the four countries.

### 2.3 Macroeconomic indicators

The data presented in Table 6 assesses the degree of convergence among inflation and long-term interest rates and investigates the consequences from the internal and external imbalances examined in section 2.1 and 2.2.

The price levels across a monetary union should converge between countries with different income levels due to easier price comparison made possible by the common currency

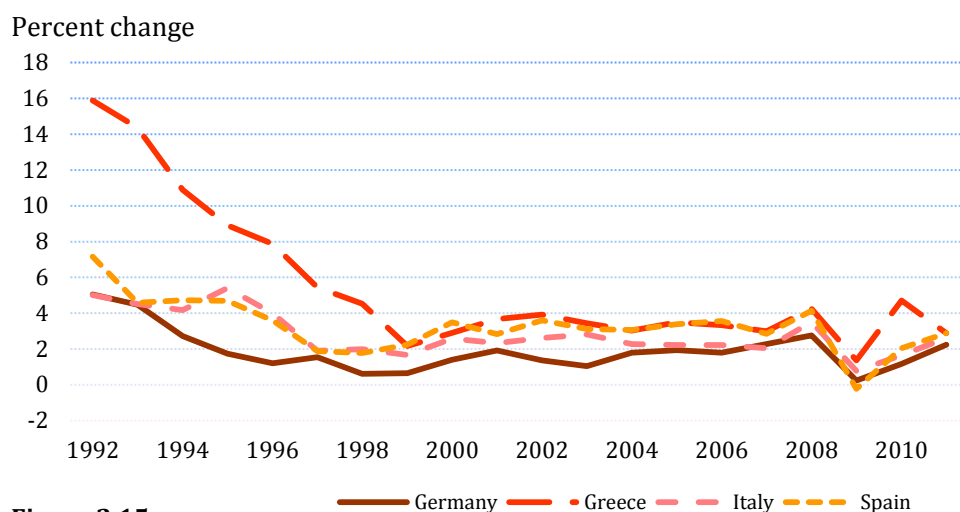
**Table 6**  
**Macroeconomic indicators for Germany, Greece, Italy and Spain (1992-2011)**

	1992-1998	1999-2007	2008-2011
<b>Inflation Average HCPI (2005=100)</b>			
Germany	86,7	97,0	108,4
Greece	66,2	93,8	115,5
Italy	77,7	95,4	110,2
Spain	74,2	94,2	112,6
<b>Inflation Annual average rate of change</b>			
Germany	2,5	1,6	1,6
Greece	9,7	3,2	3,3
Italy	3,8	2,3	2,1
Spain	4,0	3,1	2,2
<b>Nominal unit labor costs Index 2005=100</b>			
Germany	97,5	99,6	103,2
Greece (2000-2011)	n.a.	93,6	112,6
Italy	81,7	94,7	111,5
Spain	77,6	94,8	111,6
<b>Effective exchange rate Index 1999=100 (1994-2010)</b>			
Germany	109,5	93,6	89,4
Greece	96,8	100,5	110,6
Italy	101,2	104,6	115,5
Spain	102,4	105,6	117,2
<b>Unemployment rate Percent of total labor force</b>			
Germany	8,5	9,3	7,1
Greece	9,5	10,2	11,5
Italy	10,6	8,4	7,8
Spain	21,3	11,1	17,5
<b>Labor productivity per hour Index EU-27=100 (1995-2010)</b>			
Germany	130,5	125,9	125,0
Greece	n.a.	78,7	79,5
Italy	121,1	108,8	103,7
Spain	109,3	102,3	106,8
<b>Long term interest rate Monthly average observations</b>			
Germany	6,1	4,3	3,1
Greece	15,6	4,8	8,7
Italy	9,2	4,6	4,6
Spain	8,6	4,4	4,5
<b>Price Convergence Index Descending index means increasing convergence (1995-2010)</b>			
Euro area (17 countries)	25,3	20,7	16,1
Euro area (12 countries)	12,3	11,5	10,2

Sources: IMF, World Economic Outlook 2011, Trading Economics (2012) and Eurostat (2012).

(Ayuso et al. 2004). Interest rates should converge as the exchange rate risk is eliminated, making it easier for investors to take advantage of arbitrage opportunities and capital should thus flow from low-interest countries to high-interest countries (Dunn 1978). An interest rate difference between the member countries reflects risk variations, i.e. the risk premium.

## Inflation rates (1992-2011)



**Figure 2.15**

Source: IMF, World Economic Outlook 2011.

Appleyard et al. (2008) defined risk premium to be the excess demanded above expected return on assets, depending on how the investor evaluates the likelihood of adverse events.

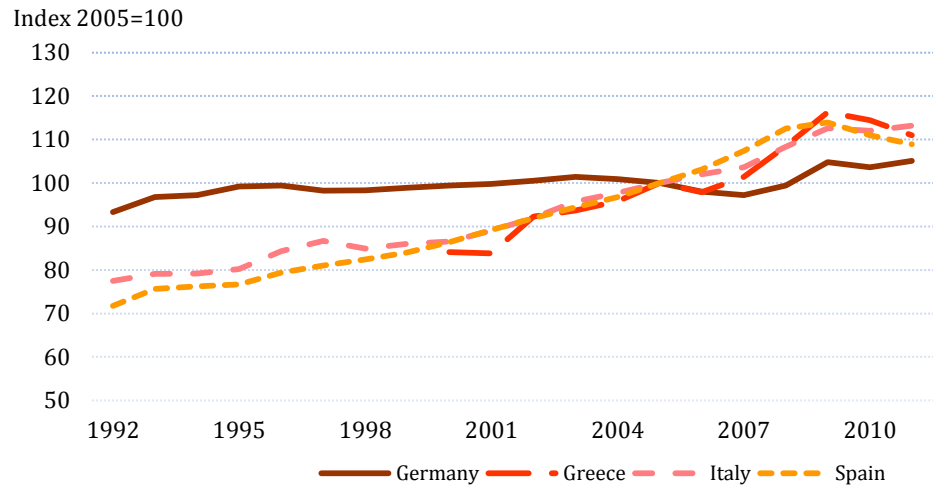
A consumer price index (CPI) measures changes in the prices of goods and services that affect the real purchasing power of consumers and their welfare (IMF 2011b). These prices do not change at the same rate, so a price index can only reflect their average movement. The first variable in Table 6 demonstrates the average yearly-harmonized consumer prices (HCPI) expressed by an index where the reference period equal 100. The values of the index show the average proportionate change in prices from 2005. In the pre and core-EMU period, Germany had the highest HCPI. Greece had the lowest index level, but increased the most from their starting point to the core-EMU period and has outpaced the other countries in the crisis-response period. Spain was second lowest in the pre-EMU period, but aligned and surpassed Italy in the crisis-response period. The percentage change in annual inflation is calculated as annual percentages of average consumer prices and as year-on-year changes (IMF 2011b). Figure 2.15 illustrates that all four countries' inflation rates declined and converged in the pre-EMU period to comply with the Maastricht-criteria. In 1997, German, Italian and Spanish inflation was nearly equal, but the graph shows that Germany decreased inflation further and remained at a lower level until 2008. The high Greek inflation in the pre-EMU period was reduced to 2.1 percent in 1999, which is the lowest recorded level for Greece. However, the inflation level increased in the core-EMU period and remained between 3 and 4 percent until 2008. The rate dropped in 2009 and then peaked in 2010 with almost 5 percent inflation. Italy and Spain's inflation rates were also at high levels in the pre-EMU period. Italy had the lowest inflation of the three southern countries and was below 2 percent between 1997 and

1999. Following this, it increased until 2003, after which it started to decline towards 2 percent. The rate was close to 2 percent between 2004 and 2007, until it reached 3.5 percent in 2008. The rate then decreased in the crisis-response period.

Spain was also below 2 percent in 1997 and 1998. The average inflation was 3.1 percent in the core-EMU period. The inflation rate in 2008 was higher than previous years for Spain. Greece and Spain had very similar inflation rates and remained above Italy during the entirety of the core-EMU period. The convergence was not fully completed in the core-EMU period, while the down and up-turn in the crisis-response period has been equal for all countries, except Greece. Relative higher inflation compared to the EMU-average can lead to an appreciation of that country’s real exchange rate.

Unit labor costs are reported as percentage change compared to the corresponding period in the previous year in quarterly nominal data and are the ratio between the cost to the firm of each employee and the value produced by his or her work. The costs are both wage and non-wage related, such as employers’ contributions to pension schemes and social security (Eurostat 2012). Figure 2.16 demonstrates that the German costs remained stable for a time and then decreased between 2004 and 2007. The costs then started to increase until they stabilized in 2009. The unit labor costs in Italy and Spain was low relative to the German costs in the pre-EMU period. These countries’ cost levels aligned with and surpassed the German level in the core-EMU period. However, the Spanish costs have declined while the Italian costs remained constant during the crisis-response period. The Greek unit labor costs increased at the same speed as the Italian and Spanish costs in the core-EMU period, but despite a slight drop between 2005 and 2006, it surpassed the other countries in 2009.

**Unit labor costs, annual data (1992-2011)**



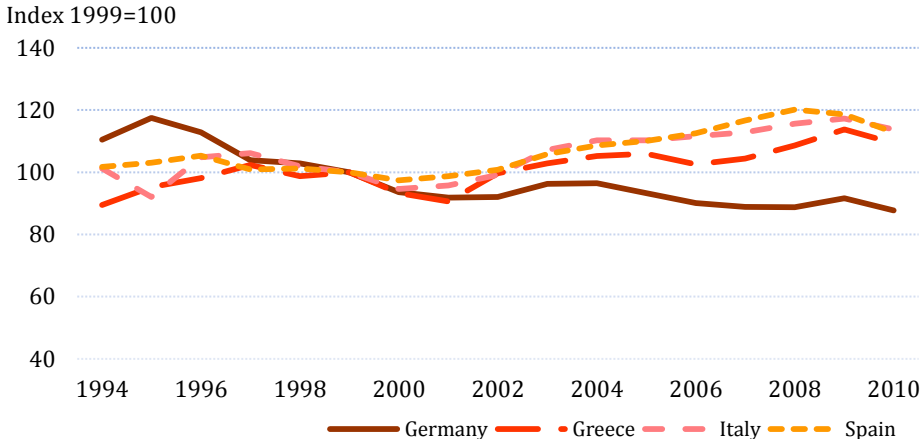
**Figure 2.16**  
Source: Eurostat (2012).

Diverging unit labor costs contribute to inflation differentials among countries in a monetary union. The labor cost growth rate has been highest in Greece, followed by Spain and then Italy, contributing to diverging inflation in the EMU and reduced competitiveness for these countries. Greece has had the highest inflation of the four countries, followed by Spain and then Italy. The quickly rising unit labor costs have thus contributed to loss of competitiveness relative to the main trading partners in EMU.

Other reasons for a diverging inflation rate in a monetary union are price level convergence, cyclical divergence, structural and institutional features or the Balassa-Samuelson effect (Ayuso et al. 2004). Artis (2007) explained the Balassa-Samuelson effect as follows: countries undergoing development can expect their real exchange rate to appreciate for a period. The reason for this is that the countries' export prices must compete in the international market when they enter into international trade. This appreciation is unproblematic if the tradable sector experiences enhanced productivity growth following the country's development process. The productivity growth will cause wages to rise in the entire economy, leading to a price increase in the non-tradable sector. In a flexible exchange rate regime, the nominal and real value appreciates, but in a fixed exchange rate regime the real appreciation leads to rising prices. This process is an equilibrium adjustment for the countries concerned, but its impact on the price index is hard to distinguish from inflation and is referred to as the Balassa-Samuelson effect. In the EMU the Balassa-Samuelson effect and structural and institutional features, the latter including diverging unit labor costs, are possible explanations for the diverging inflation level.

Figure 2.17 illustrates that the real effective exchange rate has appreciated in the core-

**Real effective exchange rate (1994-2010)**



**Figure 2.17**  
Source: Eurostat (2012).



EMU period for the southern countries relative to the pre-EMU period and Germany, which has depreciated. All countries have endured depreciation in the crisis-response period. De Grauwe (2009) argued that Greece and Spain experienced the Balassa-Samuelson effect, as they had lower income levels and catching-up potential with the northern European states. The previously reported convergence in GDP per capita and consumption supports the potential for catching-up. Ayuso et al. (2004) argued that the higher Spanish inflation is not due to the Balassa-Samuelson effect, but rather to malfunctions in the goods and labor market originating in sheltered sectors of the economy. They presented higher mark-ups in the non-tradable sector due to poor productivity growth and market rigidities as the reason behind inflation above the EMU-average, i.e. structural factors. Italian inflation has been higher than the average EMU level and cannot be attributed to the Balassa-Samuelson effect because Italian productivity growth has been similar to other high-income EMU countries (De Grauwe 2009). According to Weber (2010), inflexible labor markets caused wages to increase more than productivity in the southern countries, who accumulated current account deficits, which supports that higher unit labor costs is the reason behind higher inflation in Italy, Greece and Spain.

The International Labor Organization (ILO) defines unemployed workers to be those who are not currently working, but are willing and able to work for pay, who are available to work and have actively searched for work (IMF 2011b). Germany, Italy and Spain use the ILO definition, while Greece uses their own national definition. Table 6 illustrates that Spain has the highest unemployment rate of the four countries in all periods. The unemployment rate decreased by more than 10 percent in the core-EMU period, but increased by 6 percent after the crisis. The Italian unemployment rate is the lowest of the southern countries and has declined in every period since joining EMU. Greece and Germany experienced increased unemployment in the core-EMU period. German unemployment decreased from the core-EMU period to the crisis-response period by 2.2 percentage points, on average, while Greek unemployment increased after the crisis.

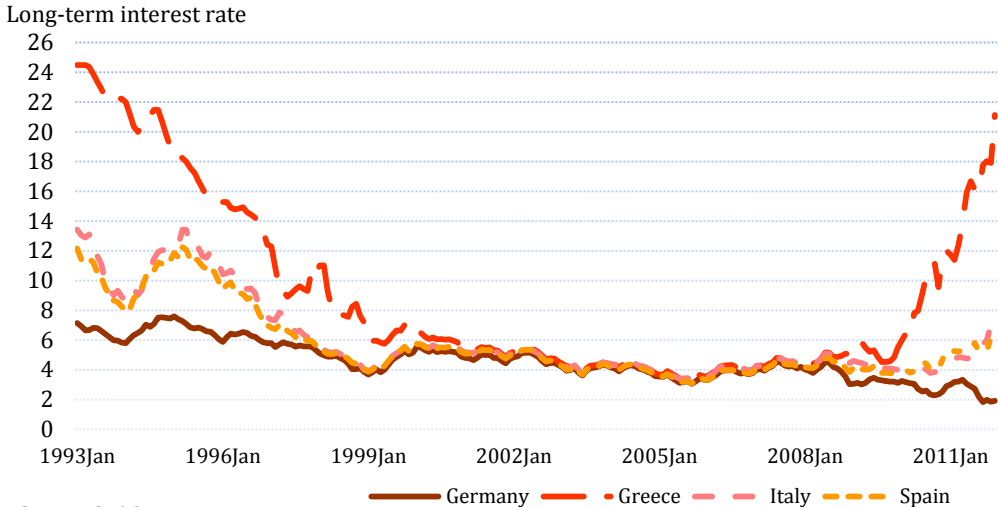
Labor productivity figures are expressed in PPS, i.e. a common currency that eliminates the differences in price levels and allows volume comparisons of GDP between countries. The measurement of productivity per hour worked removes the differences in the full-time and the part-time composition of the workforce. A country's level of GDP per hour worked is higher than the EU average if the country's index surpasses 100 (Eurostat 2012). Table 6 shows that this was the case for Germany, Italy and Spain, but that Greece was well below 100. German labor productivity was the highest of the four countries prior to joining EMU, but declined in

the core-EMU and crisis-response period. Greek labor productivity has been stable since 2000. Italian labor productivity was well above 100 in the pre-EMU period, but severely decreased throughout the core and crisis-response period. Spain’s labor productivity was at its highest in the pre-EMU period. It declined in the core-EMU period and although it increased in the years following the financial crisis, it remains below the pre-EMU level.

The average long-term interest rates in Table 6 were significantly lower for all four countries in the core-EMU period compared to those in the pre-EMU period. Greek government bonds faced the highest risk premium for borrowing in the financial market prior to joining EMU, followed by Italy and Spain. German bonds were perceived as the least risky and declined in the crisis-response period compared to the core-EMU period.

Figure 2.18 demonstrates that the interest rate for 10-year Greek government bonds was 24.5 percent in January 1993. The Greek preparation to join EMU coincided with a sharp decline in the rate, until the spread nearly converged with the German rate in the autumn of 2000. The high long-term interest rate from 1993 onwards implies that the market evaluated the risk of a Greek government default to be high. The Greek interest rate reached its lowest level of 3.3 percent in September 2005. By December 2009, it had increased to 5.49 percent and to 12 percent in December 2010. The interest rate steadily increased to 21 percent in December 2011, effectively blocking Greece from issuing new bonds to re-finance its government debt. High government debt, an excessive fiscal deficit, a large BOT deficit, low productivity and high unemployment all contributed to both internal and external imbalances, making the economic situation unstable. Greece was dependent on refinancing its debt to

**10 year government bond yields (1993-2011)**



**Figure 2.18**  
 Source: Greek Public Debt Management Agency, Italian Department of treasury, Tesoro Pubbico from Trading Economics (2012).

serve current expenditures. The highly interlinked European capital market caused fear of contagion and forced investors to demand a high risk premium to hold Greek government bonds. The average difference relative to the German rate was 9.5 percentage points in the pre-EMU period, declining to 0.5 in the core-EMU period and increasing to 5.6 after 2008. The average difference for the whole period was 4.4 percentage points from 1993 to 2011.

The Italian long-term interest rate was high in the pre-EMU period. The rate converged towards the German rate, after a peak of 13.5 percent in March 1995, following Germany closely until June 2008 when the German rate noticeably declined and the Italian rate remained much the same. The Italian rate started to climb in December 2010, increasing the spread further. It reached a peak of 7 percent in November 2011. The average difference relative to the German rate was 3.1 percentage points in the pre-EMU era, declining to 0.3 in the core-EMU period and increasing to 1.5 after 2008. The overall average difference was 1.4 percentage points between 1993 and 2011.

The government bond rate in Spain was 13 percent in January 1993. There was some volatility, but after reaching a new peak of 12.26 percent in March 1995, the Spanish rate converged towards the German rate and continued to do so until 2010. The rate then increased in 2011 and reached 6 percent in November of that year. The average difference relative to the German rate was 2.5 percentage points in the pre-EMU period, declining to 0.1 in the core-EMU period and increasing to 1.5 after 2008. The overall average difference relative to the German rate has been 1.4 percentage points between 1993 and 2011.

The fear of contagion following a Greek default and high government debt growth, combined with changing demographics and low economic growth caused creditors to demand higher Italian yields. This divergence demonstrates that country-specific risk differentials are still present in EMU.

The comparative price levels at the end of Table 6 are the ratio between purchasing power parities (PPPs) and the market exchange rate for each country. If the coefficient of variation of the price levels decreases over time, the national price levels are converging (Eurostat 2012). The convergence has come a long way, but has not changed significantly for the 12 founding EMU countries, including Germany, Greece, Italy and Spain. A large share of the price convergence potential in these countries seems to have been realized prior to the creation of EMU, but there is a higher potential amongst the newer member countries.

Fischer (2009) cited various studies conducted after EMU was launched that support the view that a significant degree of the European price convergence happened in the early 1990s. However, the previously mentioned low trade in services suggests that there are considerable

local rents being extracted at consumers' expense, even when considering the locality of some service provision (Trichet 2011). This means that there should be scope for further price convergence, despite much of it already having taken place in the pre-EMU period.

According to data from Eurostat (2012), the monthly minimum wage in Greece was 50 percent of average monthly earnings in the years between 2000 and 2009. The minimum wage in Spain was 34.5 percent of average monthly earnings in that same time period. The corresponding German and Italian data are not available. According to Eurostat (2012), the average tax rate on income and wealth in Greece was 17 percent of GDP between 1999 and 2007 and 16 percent of GDP between 2008 and 2010, while the corresponding numbers for Germany was 23 percent in both time periods. The average tax rate in Spain was 21.6 percent of GDP between 1999 and 2007 and 20 percent of GDP between 2008 and 2010. Italy had the highest tax rate of the three countries, with 28 percent of GDP between 1999 and 2007 and 29.5 percent of GDP between 2008 and 2010. The average tax rate was estimated based on all government taxes and payments to social security funds.

There is a variety of retirement ages depending on occupation in the four countries. To emphasize that the retirement age will depend on choice of profession, the comparison of average effective retirement age is made in Table 7. Greek men and Spanish women have the highest average effective retirement age, while Italian men and women have the lowest. The retirement patterns have been consistent in each country between all periods. There has been a downward trend in the Greek male retirement age between the first period and the third period; the reverse is true for German men.

**Table 7**  
**Average effective retirement age (1992-2009)**

	1992-1998*		1999-2007		2008-2009	
	Men	Women	Men	Women	Men	Women
<b>Germany</b>	60,6	59,5	61,3	60,4	61,5	60,4
<b>Greece</b>	63,3	61,2	62,7	61,6	62	60
<b>Italy</b>	60,7	57,9	60,6	60,2	60,8	59,8
<b>Spain</b>	61,2	63,3	61,5	62,5	61,7	63,3

\*German time series starts in 1996. Source: OECD (2012).

## **2.4 The effect of the internal and external imbalances in EMU**

After introducing the euro, capital flows between member countries increased due to the elimination of exchange rate volatility and perceived lower default risk. Countries that accumulated excess savings relative to domestic investments became net exporters of capital. This enabled a further decoupling between domestic investments and domestic savings. Excessive private and public borrowing, fuelled by low interest rates, began in the southern countries. Investments increased, leading to both higher production and greater demand for labor. The upward pressure on wages increased production costs and reduced the productivity gained from the investments. Inflation increased more quickly in the southern countries than in their trade partners, leading to lower foreign demand. A large trade deficit emerged, despite positive net trade with services. The southern member states lost their competitive power compared to other EMU member countries and the rest of the world. Combined with high government debt and deficits, the situation became unsustainable after the financial crisis (Gros 2012a).

The soaring interest rates in the interbank market in September 2008 created a credit crunch that forced governments to help recapitalize the banking system to prevent defaults and contagion. The recession following the crisis caused EMU member states to individually conduct counter-cyclical fiscal policies, resulting in increased government spending. These policies, combined with lower tax revenues, resulted in budget deficits and the European countries without excessive surpluses or savings started to accumulate debt.

After the crisis, risk aversion among creditors heightened back to pre-EMU levels, stopping capital inflow to Greece, Italy and Spain. Mayer et al. (2012) argued that the effect of the sudden stop of capital inflow to the dependent southern countries was different than the experience in emerging markets in the 1980s and 1990s because devaluation is not an option in EMU. Instead, painful private and public deleveraging over the coming years is necessary to counteract the effect of this sudden stop.

Greece and Italy were the only EMU members with a debt-to-GDP ratio higher than 100 percent prior to the financial crisis, while Spain was well within the ceiling. The increased public expenditures in response to the crisis have now been replaced by different austerity measures. In May 2010, Greece implemented an austerity plan of €30 billion and Spain plans to cut €65 billion between 2010 to 2013 (Midthjell 2011).

Greece is a special case with a history of manipulating the macroeconomic data reported to Eurostat to hide continuous violation of the SGP. Public knowledge of the true government

deficit early in 2010 caused the long-term interest rate to rise, eventually cutting Greece's access to private capital markets. The inability of the Greek government to roll over debt became a European problem, as German, French, Italian and Belgian banks own a large share of Greek government bonds. Greece was on the verge of insolvency.

Following a series of negotiations with *the Troika*, a three-year Greek financial assistance package of €10 billion was agreed in May 2010 (Nelson et al. 2010). The package consists of bilateral loans and has to be repaid with market-based interests. EMU members will contribute €80 billion and the IMF €30 billion. Greece received the first part of the loan in 2010. Further assistance depends on Greek implementation of austerity measures and debt restructuring agreements with private debt holders. A bail-out fund was created, called the European Financial Stability Facility (EFSF), which will become the European Stability Mechanism (ESM) in 2013. The ESM will possess a capital base of €80 billion by 2017, which provides it with a lending ceiling of €500 billion (EFSF 2012).

Financial stability has been threatened throughout 2011 due to the inability of the European leaders, headed by the German Chancellor Angela Merkel and the French President Nicolas Sarkozy at the time, to get the desired results from negotiations with the Greek government. Continuing negotiations, climaxing when Greek debt needed to be refinanced, led to growing discontent among the European countries with Greece's political choices. The turmoil reached a height on 6 November 2011 when the Greek Prime Minister George Papandreou resigned after asking for a referendum on the Greek rescue package, closely followed by the Italian Prime Minister Silvio Berlusconi resignation on 8 November. Long-term interest rates increased to unsustainable levels in Italy, Portugal and Spain, and the uncertainty intensified. To bring the yields down, the ECB provided €1000 billion in cheap credit to European banks through the Longer-Term Refinancing Program (LTRO), which are three-year loans (ECB 2012c).

New technocratic governments were established in Greece and Italy in November 2011. *The Troika* granted a second Greek loan of €9.4 billion in March 2012 (European Commission 2012b). Private holders of Greek debt agreed to a 50 percent haircut, i.e. a subtracted percentage from the market value of an asset that is being used as collateral, in March 2012 (ECB 2012b). They traded in their current bonds for new ones at less than half the face value of their previous bonds. These new bonds also had longer maturity at lower interest rates. This transaction amounted to €100 billion out of the €500 billion debt and is expected to lower Greek national debt to 120 percent of GDP by 2020. This act alone does not solve the question of when Greece can return to international financial market funding.

The Italian and Spanish situation was different. Koo (2011) argued that the bursting of the housing bubble in Spain led to a balance sheet recession. The declining asset prices affected the balance sheets of corporations, household and banks, forcing them to deleverage. Low interest rates make more investments profitable, but Spain experienced falling industrial production and rising unemployment. According to Koo, this happened because the private sector was minimizing debt instead of maximizing profits.

The same deleveraging happened in Italy. The Italian government was able to borrow at a lower interest rate after joining EMU. Implementation of expensive social security programs aimed at closing the gap between the living standard in the southern part of the country and the northern part, increased the debt. Declining government revenue after the financial crisis left the country with tough decisions on how to balance the budget. Even though Italy is one of the world's largest economies, it faced low growth prospects because of its low birth rates and declining productivity. Koo (2011) argued that private sector savings increased after the crisis, demonstrating that they are in a balance sheet recession.

It is evident from this review that changes in the structure of EMU have to be made to address the differences that have developed between the member states. Decressin and Stavrev (2009) stated that there was fear prior to the formation of EMU that country-specific shocks would result in larger and more persistent current account imbalances between member states, severely undermining the functioning of the monetary union. Policies to manage the current account developments, as well as stricter compliance with the SGP, could have prevented the imbalances from growing so vast. In a worst case scenario, the total amount needed to provide the PIIGS-countries with liquidity and hinder a default will amount to 46 percent of the whole euro zone's GDP (Boone and Johnson 2012).

The internal and external sources of imbalances are related to whether EMU satisfy the criteria for an optimal currency area. The lost possibility of an individual monetary policy could be problematic if EMU is not an optimal currency area. It may be the design of EMU that is flawed or that the policies were just not followed, such as the SGP. A literature review of what is necessary for a monetary union to be beneficial and to deal with country-specific shocks is presented in the next chapter.





### **3. Theoretical framework**

A group of countries constitutes an optimal currency area if the macroeconomic and microeconomic benefits of having a common currency outweigh the costs of foregoing one's own currency. No formal mathematical model exists to assist in the calculations of when countries should come together to form a monetary union. Whether the arrangement is an efficient economic feature depends on the not so straightforward analysis of the costs and benefits of a membership, and on the political and social preferences of giving up national sovereignty by the member states. In addition, as a monetary union requires fixing of the national exchange rates, the gains from having a fixed regime must be greater than the gains from letting the rates float.

#### **3.1 Implications of a fixed exchange regime**

##### ***3.1.1. Definition of fundamental concepts***

The nominal exchange rate,  $E$ , is the price of domestic currency in terms of foreign currency, and results from the interaction of supply and demand in the foreign exchange market (Appleyard et al. 2008). When the authorities decide to implement a fixed exchange rate regime, a target level of the nominal exchange rate,  $\bar{E}$ , is specified, and monetary policy is conducted with the aim of hitting this target (Alesina and Barro 2001). The target can be a specific or implicit value; that moves within a band or a range. IMF's classification of fixed exchange rate regimes divides between soft and hard pegs. Soft pegs are different arrangements of pegging the domestic exchange rate to a foreign currency, such as a horizontal bands and a crawling peg. Hard pegs are currency board arrangements and arrangements with no separate legal tender, such as dollarization and a monetary union. According to IMF's exchange rate classification system, 101 out of 188 countries had some form of pegged regime as of 30 April 2008 (Habermeier et al. 2009).

Blanchard et al. (2010) argued that flexible exchange rates are generally preferred over fixed by economists and policy makers, but with two exceptions. In the case of a less trustworthy central bank, the country can gain from tying its currency to another country that has a respectable central bank, rather than letting the exchange rate float. Countries with a history of high inflation can gain credibility by fixing its rate to another country with low and stable inflation. The hard pegs, such as a currency board and dollarization, will help achieve an anti-inflationary reputation. The other case when a fixed exchange rate is preferable is

when it is largely beneficial for a group of countries to adapt a common currency because they already have interlinked economies, i.e. a monetary union.

Entering a fixed regime requires the surrendering of two macroeconomic policy measures, the monetary policy instrument and the exchange rate instrument. To understand the implications of this for a particular country the concepts of the law of one price (LOOP), purchasing-power parity (PPP) and interest rate parity must be elaborated.

Equation (3) is based on the LOOP stating that goods and services should have equal prices anywhere in the world because market participants recognize and take advantage of arbitrage opportunities between different geographical locations. According to Kenen (2000) LOOP is a concept for comparing prices of the same goods in two countries and must be extended to cover the general price levels for all products across countries when used in relation to PPP. The author gives two objections to the laws validity across two countries price levels: homogenous products across countries may still have substantial differences despite appearing very similar, and the weighted price indexes used may give different weights to the same products in two different countries.

$$E = PPP = \frac{P_H}{P_F} \quad (3)$$

The LOOP holds given competitive markets with no barriers to entry and substitutability of homogenous goods across countries, no transportation costs or other transaction costs, and no trade policy regulations or government interventions (Samo and Taylor 2002). These conditions are hard to meet, as transaction costs and trade regulations are real, leading to the concept of relative purchasing power.

PPP is a measure of the nominal exchange rate that can be used to identify the true underlying equilibrium exchange rate that would result from a balanced current and capital account (Appleyard et al. 2008). The absolute version of PPP is expressed in equation (3) and links the prices of domestic and foreign goods (Kenen 2000). Here, the nominal exchange rate equals domestic prices,  $P_H$ , divided by foreign prices,  $P_F$ . The prices can be viewed as an index of the price levels of different goods in the domestic and the foreign countries.

If the nominal exchange rate equals one,  $E = 1$ , the domestic price level is equal to the foreign level,  $P_H = P_F$ . Equation (3) entails that prices of tradable goods and services should be the same in any two countries when expressed in a common currency. The price level, i.e. the inflation level, measures the decreasing purchasing power of a currency. Countries need to have equal inflation rates with its trade partners to achieve equilibrium in the goods and

service market. Achieving this requires a constant relationship between prices of exports and imports. Changes in the domestic price levels results in a change of the nominal exchange rate, as it will move to offset changes in the inflation rate differential between two countries. If domestic inflation is higher than foreign inflation, the exchange rate will increase and the domestic currency will depreciate relative to the foreign currency. This pushes the exchange rate and domestic prices back in line with PPP and restores equilibrium. For a price change to have a real effect on the balance of trade, there needs to be a time lag before  $E$  changes, to restore the equality.

Kenen (2000) argued that due to the neutrality of money, PPP will only hold in the long run, and can thus only be used to define the long-run response of the exchange rate to a purely monetary shock and not to describe actual exchange rate behavior. Sarno and Taylor (2002) reviewed previous empirical findings on real exchange rate volatility and concluded that exchange rates for major industrial countries seek purchasing power parity in the long run, but they do not find evidence for this in the short run.

Appleyard et al. (2008) argued that relative purchasing power parity is more realistic, as it relates the change in the exchange rate to the change in the price level. If domestic prices rise faster than foreign prices, the domestic currency should depreciate. The same amount of domestic currency would purchase fewer foreign goods, leading to decreasing imports while exports can increase. This will improve the current account. If domestic prices are rising slower than foreign prices, the domestic currency should appreciate. When using a base period for the exchange rate, the equilibrium rate, i.e. the relative PPP, will affect the relative rates of price change in the two countries. The authors provided evidence that the nominal exchange rate and the relative PPP rate for the Deutsche mark to the U.S. dollar were very different from 1971 to 1998. The nominal exchange rate was overvalued compared to the relative PPP rate. The authors gave the higher interest rates in the U.S. as a possible explanation for the discrepancy that was particularly large in the years 1983 to 1986. A higher interest rate attracts capital inflow and this causes an appreciation of the nominal exchange rate. However, after the introduction of the euro, the rates have been almost identical in the years' between 1999 and 2006.

The real exchange rate  $\varepsilon$  is equal to the nominal exchange rate  $E$  times the foreign price level  $P_F$  divided by the domestic price level  $P_H$ . The real exchange rate is the price of domestic goods in terms of foreign goods, and will thus affect a country's current account (Blanchard et al. 2010). This can be seen by examining the definition of the real exchange rate,

$$\varepsilon = \frac{EP_F}{P_H} \quad (4)$$

Under a fixed regime the real exchange rate can be adjusted through a change in domestic prices relative to foreign prices. This makes it possible for the real exchange rate to shift in the medium run, while the nominal rate stays fixed. By examining equation (4), it is evident that if domestic prices increase more than foreign prices, and if the nominal exchange rate is fixed, the right hand side will steadily decrease, i.e. the real exchange rate will appreciate to restore the equilibrium. A declining domestic price level leads to a depreciation of the real exchange rate which improves the country's competitive position. This leads to increased output, assuming the foreign price level is constant. These changes will make the country reach the same real exchange rate and the same level of output in the medium run, regardless of its exchange rate regime, according to Blanchard et al. (2010).

The equilibrium condition in the foreign exchange market is called interest rate parity and is illustrated by equation (5). Interest parity links the foreign exchange market to the domestic money market. The domestic interest rate is determined by the equality of money supply and money demand. In equilibrium the domestic interest rate,  $i$ , must equal the foreign interest rate,  $i^*$ , plus the expected depreciation or appreciation rate of the domestic currency (Blanchard et al 2010).  $E_0$  is the nominal spot exchange rate, while  $E^e$  is the expected future exchange rate and reflects a country's balance of payment status as well as other factors market participants find important for the country's external and internal balance. If the depreciation or appreciation expectations equals zero at time  $t$ ,  $E_{t+1}^e - E_t = 0$ , domestic and foreign interest rates will be equal,  $i_t = i_t^*$ .

$$i_t = i_t^* + \left( \frac{E_{t+1}^e - E_t}{E_t} \right) \quad (5)$$

There will be differentials between the domestic and foreign interest rates if the perceived risk is different in the countries. The difference in the interest rates is thus equal to the risk premium demanded by investors to be willing to invest in the country (Appleyard et al. 2008). The higher the perceived risk is, the higher will the demanded risk premium be. This is shown in (6) where  $\rho$  is the risk premium (Krugman and Obstfeld 2006).

$$i_t = i_t^* + \left( \frac{E_{t+1}^e - E_t}{E_t} \right) + \rho_t \quad (6)$$

The interest parity condition is a no-arbitrage condition, meaning that the expected return on deposits of any two currencies is equal when measured in the same currency. This will cause foreign and domestic currency deposits to be equally desirable assets, and risk-neutral market participants should be indifferent to whether they are investing in domestic or foreign currency denominated assets (Bladen-Hovell 2007). The foreign exchange market is thus in equilibrium when there is no difference in the expected rate of return, depending on what currency the asset is denominated in. The following conditions need to be satisfied for interest parity to hold: no transaction costs, no capital-controls, identical assets and indifferent preferences when it comes to holding foreign currency-denominated assets.

To understand why a country prefers to give up the policy measures of autonomous monetary policy, a further investigation of the advantages, as well as disadvantages, of fixing the exchange rate, must be undertaken.

### ***3.1.2 General costs and benefits of a fixed exchange rate regime***

A macroeconomic trilemma of a fixed exchange rate regime, is referred to by Frankel (1999) and Beck and Prinz (2012) as an “impossible trinity”. A country can only achieve two out of the three goals: a fixed exchange rate; full capital mobility between countries; and domestically independent monetary policy. If a country fixes its exchange rate, it can maintain an individual monetary policy only if it imposes capital controls, as this will make sure the interest parity condition holds. If a country wants both monetary independence and full capital mobility, it cannot fix the exchange rate, because if it does, arbitrage possibilities will put pressure on the nominal target. This illustrates that if a country wants to be a part of the international capital market and wants to fix the exchange rate, it surrenders its monetary autonomy.

The implication of this might be hard to quantify as already interlinked economies need to consider the interest levels of its major trading partners when deciding the policy rates, regardless of exchange rate regime, leaving monetary policy a weaker instrument in open economies. The condition of interest rate parity might thus reduce the cost of surrendering the monetary autonomy. Beetsma and Giuliodori (2010) argued that surrendering of monetary autonomy can be welfare enhancing in the context of the Barro-Gordon model where discretionary central banks are assumed to trade off low inflation and boosting output above its natural level. According to this model, national central banks conducting an autonomous monetary policy have an incentive to create surprise inflation aimed at capturing foreign market shares. This can be done through expansionary monetary policy causing, lower real

wages in the home country for given nominal wage contracts, shifting production from abroad to the home country as the firms real costs now will be lower. The authors argued that this would cause negative spillover effects among sovereign states as it leads to a higher equilibrium level of inflation than necessary. High deficits may lead to inflationary pressure which in turn may force the central bank to increase the interest rate (Fatas and Mihov 2010).

A fixed exchange rate regime removes the possibility of using  $E$  as a trade policy measure. The magnitude of the lost instrument is hard to quantify. The macroeconomic costs will be greater in the case of downward wage and price rigidity, as regained competitiveness then must come from an internal real depreciation relative to the trade partners (Bayoumi 1994).

The mechanics of a nominal depreciation can be illustrated by a general equilibrium model consisting of the tradable and non-tradable goods sector. Under floating exchange rates, a nominal depreciation of  $E$  attracts resources to the tradable goods sector, shifting resources away from the non-tradable goods sector. This is because the tradable sector faces more favorable business conditions, as it will experience demand growth when domestic goods become cheaper for foreign consumers (Appleyard et al. 2008). A depreciated exchange rate alters the relative prices between domestic and foreign countries, making the domestic goods cheaper for foreigners and thus increases domestic export-demand. But the nominal exchange rate depends on market participants' expectations, and these expectations might be hard to alter. When a country depreciates its nominal exchange rate other countries' currencies effectively appreciate. The enhanced competitiveness comes at the expense of its trade partners and illustrates that a depreciation cannot be frequently used, and the effect is often temporary (De Grauwe 2009). Coordination between countries under a fixed exchange rate regime prevents these competitive depreciations to occur (Beetsma and Giuliodori 2010).

However, depreciation can be a powerful tool to regain competitiveness by boosting export demand when used in combination with contractionary monetary and fiscal policy. It allows a quicker way to recovery than an internal process of real devaluation, assuming the Marshall-Lerner condition holds (Blanchard et al. 2010). Iceland is an example of how a depreciation of the currency can contribute to quicker economic recovery. The Icelandic krona severely depreciated when it became clear that the Icelandic banking sector would not be able to meet its liabilities in the fall of 2008. The government imposed capital controls on 28 November 2008 to hinder a further fall, which has not been lifted since. Iceland has increased exports, and now has a positive trade balance. Iceland's growth rate was above the EMU countries average in 2011 and unemployment well below (Buiters and Egilsson 2011). The Baltic

nations did not alter their peg to the euro after the financial crises. Instead, the countries went through a period of recession and wage adjustments (Boone and Johnson 2012).

Appleyard et al. (2008) investigated whether countries are better protected from external shocks under a fixed or flexible exchange rate regime. A country with a fixed exchange rate regime will be more affected by its trading partners' business cycle fluctuations. The business cycles will be transmitted between countries because lower domestic income means lower imports, thus decreasing income for its trading partners. This will lead the foreign country to import less from the domestic country, causing further decrease in domestic income. They argued that flexible exchange rates would serve to lessen the real effects on the economy from this transmission by a depreciation of the currency. They also discussed whether a fixed or flexible regime is more likely to suffer from destabilizing speculative attacks on the currency, but they do not provide a clear-cut answer to which regime is more vulnerable, as this will depend on the central banks access to currency reserves and other internal and external country-specific factors.

Microeconomic gains from a fixed exchange rate regime are the support for market integration leading to convergence among prices, wages, and nominal and real interest rates. It creates one market, i.e. globalization. Krugman and Obstfeld (2006) cited the monetary efficiency gain as a major benefit from joining a fixed exchange rate regime. This gain comes from lowered transaction costs when transferring from one currency to another, and from the elimination of legal and institutional differences between the involved countries (Bayoumi 1994). Bladen-Hovell (2007) mentioned increased price transparency, leading to more competition among firms. More competition reduces firms mark-up, creating an incentive for more efficient production, and will lower the prices faced by consumers.

The major macroeconomic benefit from a fixed exchange rate regime is the elimination of exchange rate uncertainty, leading to a more stable macroeconomic environment and increased economic interaction (Krugman and Obstfeld 2006). Kenen (2000) argued that it is not possible to fully hedge against large and long-lasting changes in the exchange rate. There exists uncertainty about the future prices producers will receive for their exports and about the size of foreign demand for their products (Micco et al. 2003). This leaves the producer without knowledge about how much foreign currency is needed in the future and makes it unlikely that any forward purchases will perfectly match the exchange rate changes.

Most developed countries having floating rates have experienced fluctuations in nominal and the real exchange rate. The nominal exchange rate has not moved to a stable equilibrium level and there has been exchange rate overshooting (Appleyard et al. 2008). The variation in

nominal rates has not been perfectly matched by the variation in purchasing power parity (PPP), causing variations in the real exchange rate. Appleyard et al. (2008) stated that the nominal exchange rate variation in the world has been substantial over the whole post-Bretton Wood era. The nominal fluctuations were followed by real exchange rate fluctuations, causing considerable “variations in international competitiveness as well as dislocations in the export and import-competing sectors of countries” (p. 748). The authors show evidence that the volatility has continued in the 2000s by examples of the U.S. dollar and the Japanese yen.

The elimination of exchange rate risk can reduce uncertainty about the present value of future profits, leading to a more predictable investment climate that generate more domestic and foreign investments as it reduces the risk premium demanded by investors. The degree of fluctuations under fixed exchange rates will depend on the credibility of the commitment from the authorities and the underlying stability of the economic development. It is necessary that the commitment to fixing the exchange rate is fully believed by the economic agents for achieving the elimination of uncertainty.

Increased trade is a macroeconomic benefit from reduced exchange rate risk, as it ensures economic efficiency by encouraging countries to exploit its comparative advantage in production, leading to increased output. Trade is beneficial whenever there are differences in the relative price levels between potential trading partners when they are in a state of autarky (Krugman and Obstfeld 2006). The diverse price level occurs due to differences in demand and supply conditions (Appleyard et al. 2008).

The relative change in prices from increased trade can leave domestic consumers better off without any change in domestic production patterns. This can happen if some of the domestic goods they consume have foreign substitutes that can be imported and consumed at a lower price than the domestic good. Their marginal utility will increase as they shift consumption towards the cheaper good and can consume more on the same income. Thus, their purchasing power improves, leaving them better off as they reach a higher indifference curve. The gains rests on some assumptions that the economic adjustment to the new relative prices is friction free and that the economy operates at full employment, as well as equal tastes and preferences among the inhabitants (Appleyard et al. 2008). If these assumptions are not met, those who gains, in principle, can compensate those who lose and still be better off. This leaves everyone at least as well off as in autarky, while some are better off.

Rose (2000) found that the elimination of exchange rate volatility had significant positive effects on trade. Klein and Shambaugh (2005) found a large, significant effect on trade between two countries where one of them has pegged its exchange rate to the other. In



addition, a pegged country was found to trade more with all other countries. Adam and Cobham (2007) found that regimes which reduce exchange rate risk and transactions costs, including currency unions, have positive effects on trade, and also obtained results which suggest that this reduction of risk have significant effects on the trade with third party countries. Meissner and Oomes (2009) presented evidence showing that a country's choice of a peg will depend positively on the initial amount of trade with other countries using that currency. They also showed that the payoffs from pegging will increase contingent on the volume of trade with other countries using that same currency.

Krugman and Obstfeld (2006) mention intertemporal trade, i.e. the trade of consumption over time, as a gain from the increased trade following reduced exchange rate risk. They argued that countries currently experiencing weak investment possibilities at home due to investments being relatively less productive than abroad should become net exporters of capital by channeling their savings to more profitable investments abroad. The current account will turn negative but this will balance out as the investments mature and are paid back to the lender, reversing the capital flow and the current account positions in the future.

This review highlights that there are no clear cut answers when it comes to the choice of exchange rate regime; it depends on country-specific preferences and characteristics.

### ***3.1.3 The different fixed exchange rate regimes***

A country that has high inflation as a result of excessive money creation and wants to stabilize the economic situation, can increase credibility and convince the financial markets of its determination to counteract the high inflation by fixing its exchange rate. A currency board or dollarization can be credible arrangements if the country wants to limit its own ability to conduct monetary policy. Dollarization entails that the domestic currency is replaced by adopting a foreign currency, while keeping the domestic central bank. Dollarization is a strict regime that allows no exchange rate manipulation. Most cases of adopting a foreign currency involve adopting U.S .dollars (Blanchard et al. 2010). Many of the countries fixing the exchange rate are smaller developing countries (Appleyard et al. 2008). The advantages from reduced exchange rate risk come from fixing the currency to its major trade partner, and also if their debt is denominated in that foreign currency. Adopting the foreign currency removes the possibility of a depreciation of the domestic exchange rate relative to the one their debt is denominated in. This is beneficial as a depreciation decreases the value of the domestic currency, making the debt burden larger. Examples of countries that use U.S. dollars are El Salvador, Ecuador and Panama (Alesina and Barro 2001).

A regime with the same features is a currency board. The country commits to not changing the domestic currency's exchange rate after fixing its value to a foreign currency. The foreign currency holder should be a credible and large nation (Appleyard et al. 2008). The only time the domestic exchange rate can change is when the issuer of the foreign currency changes its reserves. When the issuer of the "hard" currency changes its reserves, the domestic money supply must change in the same direction to avoid a BOP deficit caused by capital outflow, i.e. expanded if the reserves increase and contracted if the reserves decrease. A decrease in domestic money supply will reduce the BOP deficit and hence the reserve outflow. A currency board is attractive for countries that need to regain credibility, as it surrenders its monetary policy and imports the foreign currency holders' interest level.

Argentina decided to implement a currency board in 1991 after a history of high inflation and large macroeconomic instability (Lam and Pana 2011). The regime was successful in restoring macroeconomic stability and ensuring low inflation for a while. Inflation exceeded 2300 percent in 1991, but the currency board arrangement managed to decrease the inflation to 4 percent by 1994, even combined with output growth (Blanchard et al. 2010). However, output turned negative in 1999, and Argentina went into a recession. The peso was overvalued as it had appreciated with the dollar throughout the second half of the 1990s. Demand for Argentinian goods decreased, and a trade deficit emerged. The consequences of the recession was a large public debt and higher risk premiums on government bonds. This led to insolvency and Argentina defaulted on parts of its debt in December 2001, giving up the currency board in March 2002 by letting the peso float. The peso depreciated relative to the dollar and this caused many firms with dollar denominated debt to go bankrupt, eventually leading to a banking crisis. The currency board was necessary, but should have been abandoned after inflation had been brought under control (Blanchard et al. 2010).

A regime of pegging allows the domestic exchange rate a limited amount of variation, relative to the foreign currency, within a band that serves as a ceiling and a floor. The country can peg by fixing the local currency to one foreign currency or to a basket of foreign currencies. This will cause a direct importation of the foreign monetary policy, interest rates and inflation rate. Meissner and Oomes (2009) provided evidence showing that the preferred foreign anchor currency have changed from 1950 to 2001, from a larger variation to either using the U.S. dollar or the euro.

A crawling peg is a predetermined rate of depreciation or appreciation of the domestic currency against a foreign currency, e.g. allowing a variation within the band of  $\pm 1$  percent. The reason for choosing to implement a crawling peg can be that the country has a higher

inflation level than its main trading partner, and pegging leads to a controlled process of devaluating the domestic currency relative to the foreign currency at a pre-specified rate that will maintain the country's competitiveness (Blanchard et al. 2010). The central bank needs to have access to a sufficient amount of foreign exchange reserves to defend the value of their currency by buying foreign currency when the domestic currency is strong, and by selling foreign currency when the domestic currency is weak.

Kenen (2000) gave the gains from pegging to be that the monetary policy becomes more credible. He gave the cost of pegging to be the removal of much of the independence in monetary policy, especially in an economy with high capital mobility. He further stated that perfect capital mobility would deprive the whole effect of monetary policy on the domestic economy. Blanchard et al. (2010) mentioned that if a country pegs its exchange rate to a country with lower inflation, an overvalued domestic currency can result as this pegging leads to a steady appreciation of the domestic currency. The country's competitive power will decline and the trade balance will worsen, causing a need to adjust the exchange rate. In a situation where the devaluation expectations increase, i.e. the currency is overvalued, a country will have to raise the interest rate to keep domestic and foreign investors from withdrawing their deposits. A problem will occur if the domestic economic situation demands an unchanged or decreased interest rate, while the country needs to raise its interest rate to maintain the interest rate parity condition. Kenen (2000) argued that under a pegged regime exchange rates are not altered often enough, leading to the above mentioned difficulties.

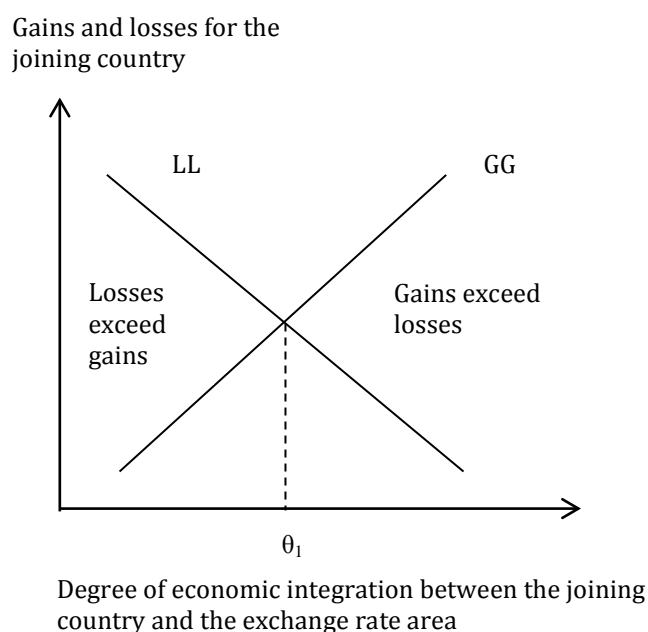
An example of countries that used to have a crawling peg, but now has abandoned it, is Colombia. Appleyard et al. (2008) cite an IMF report from 1990 that showed how the small adjustments of the Colombian peso relative to the U.S. dollar from 1980 to 1990 led to large changes in the value of the peso. In 1998, 47.28 pesos per U.S. dollar was needed. In 1990 was 502.26 pesos per dollar needed, as the crawling peg increased too rapidly, relative to its trading partners. Another example of a country that used to peg its local currency to the U.S. dollar is Mexico. Mexico pegged its peso to the U.S. dollar in 1988 (Edwards 1997). In the early 1990s, economic reforms and the membership in the North American Free Trade Area (NAFTA) led to large private capital inflows to Mexico, allowing the country to finance a large current account deficit. The Mexican peso collapsed in December 1994 despite the image of an economic "miracle" resulting from Mexico's willingness to reform (Edwards 1997). Kenen (2000) listed three shocks that occurred in 1994 that caused capital outflow from Mexico requiring the central bank to run down its reserves to maintain the peg. The Federal Reserve raised interest rates leading to more attractive investments in the U.S. A riot

in Chiapas and the assassination of a presidential candidate from the leading political party made investors doubt the political stability. The result was a currency crisis, which led to a debt crisis, making it necessary for the IMF to intervene and forcing the government to switch to a floating exchange rate in December 1994 after a widening of the exchange rate band led to \$6 billion withdrawals from the Banco de Mexico (Edwards 1997).

Another example of a pegged regime was the European Monetary System (EMS) that existed from 1979 to 1998. The participants agreed to keep their exchange rates within a narrow band, and if one country wanted to devalue or revalue its currency, it had to be agreed on by all members. The system was created in response to large exchange rate volatility threatening the economic stability and integration process in Europe in the 1970s. The system collapsed in August 1993 and the exchange rate fluctuation band was increased from  $\pm 2.25$  percent to  $\pm 15$  percent (De Grauwe 2009). The fluctuations after the collapse caused severe macroeconomic disturbances to the European economies. Padoa-Schioppa (1988) wrote about the “inconsistent quartet” of free trade, full capital mobility, fixed exchange rates and independent monetary policies in the EMS. He stated that the only long-term solution to the inconsistency would be to complement the internal market among the participating states in the EMS with a monetary union. He argued it to be unrealistic to have individual monetary policies whilst expecting macroeconomic and trade discipline from the participating states. He questioned whether irrevocability fixed exchange rates were necessary for a European monetary union, and suggested that it was not given that the alteration of the exchange rates were left under strict control by a federal monetary authority. This would leave the opportunity to alter the internal rates given an extraordinary development in for example the labor market or in the social field within one country.

The arrangement of a monetary union among sovereign states will entail fixing of the exchange rates amongst the members while maintaining a flexible exchange rate towards the rest of the world. The members will use the same multinational currency and have a common central bank. Examples of monetary unions other than the EMU are the West African Economic and Monetary Union (WAEMU) among eight West African countries. The Economic and Monetary Community of Central Africa (CEMAC) consisting of six countries are under negotiation, and a monetary union among the oil producing countries in the Gulf region has been proposed. The Eastern Caribbean Currency Union (ECCU) is an intermediate regime between a monetary union and a peg with eight member countries. The ECCU has a common currency and a common central bank, but the Caribbean dollar has been linked to the US dollar since 1976 (Blanchard et al. 2010).

Frankel (1999) argued that the countries entering a monetary union, gain credibility by adopting the strongest exchange rate commitment and that the arrangement is less vulnerable to speculative attacks. Sacrificing the policy measure of exchange rates as a stabilizing mechanism requires an environment where this does not cause real disruptions to the economy. Krugman and Obstfeld (2006) stated the countries will gain in efficiency and credibility but these gains need to be measured against the loss of the stabilization possibilities. The higher degree of openness and integration between two countries, the greater will the benefit from fixing the exchange rates to each other be (De Grauwe 2009, Krugman and Obstfeld 2006). This is illustrated in figure 3.1 where the *LL-curve* shows the economic stability loss for the joining country and the *GG-curve* shows that the monetary efficiency gain from joining the monetary union will depend on the volume of trade between the union and the potential new member.



**Figure 3.1 Assessment of when to join a monetary union**  
Source: Krugman and Obstfeld (2006).

The intersection of the *LL* and *GG* curves in figure 3.1 demonstrates a critical level of economic integration between the joining country and the area with the fixed exchange rate equal to  $\theta_1$ . This level needs to be surpassed for the joining country to achieve positive net economic benefit from joining the monetary union. According to Krugman and Obstfeld (2006) “the more extensive are cross-border trade and factor movements, the grater is the gain from a fixed cross-border exchange rate” (p. 559). The authors conclude that the higher the degree of economic integration is between the joining country and the area with fixed

exchange rates, the smaller will the stability loss from output fluctuations be. The decision to join a monetary union will thus depend on reaching a degree of economic integration with the monetary union above the critical level.

Bayoumi (1994) found that the incentives to enter a monetary union are different than the incentives to allow an entrant into the union, causing small countries to always have a larger incentive to join than the incumbents will have to admit the potential entrant. This is because the entrant will gain from lowered transaction costs on trade with the whole union, whilst the existing members will only gain from increased trade with one additional country.

The microeconomic benefits of a monetary union are the gains in economic efficiency, i.e. the reduction of transaction costs (Mundell 1961). Micco et al. (2003) argued that the elimination of exchange rate volatility would increase price transparency leading to enhanced competition among firms across country borders, strengthening the single market and leading to welfare gains for consumers by causing product prices to converge to a lower level.

Reduced transaction costs when exchanging money, and in all other financial operations, will lead to a more integrated capital market, inducing a more efficient capital allocation and lead to productivity growth (Mongelli 2008). The prices of capital, i.e. demanded return on investments, will be reduced when the capital market becomes more integrated. Higher capital mobility will lead to convergence in the price of capital across countries, as arbitrage opportunities will be taken advantage of. This will facilitate convergence in the expected return on capital,  $(P_K)_H = (P_K)_F$ , and will make sure the returns to investments is equal throughout the union, as investments will be channeled to where the return is highest and increasing the capital in that area (Dunn 1978). The removal of exchange rate risk will also increase cross-border lending, increasing foreign direct investments (FDI) as the decoupling from domestic investments and domestic savings continue. Dispersion of investments and ownership across the monetary union leads to diversification of wealth so that the member countries will be less sensitive to asymmetric shocks (Krugman and Obstfeld 2006). Artis (2007) argued that the risk-sharing financial integration allow, is particularly important in a monetary union.

Potential benefits, if the new currency becomes an international reserve currency, are increased central bank revenue, shifting of exchange risk to foreign holders of the currency and a potential boom in the domestic financial market (De Grauwe 2009). An 2007 estimate by the IMF found that central banks in advanced economies had 21 percent of their international reserve currency in euros, while the corresponding number was 30 percent for developing economies (Keste 2007). An increase in the euro's share of world reserves from

20 percent to 30 percent will cause a seignorage worth 0.5 percent of GDP (Blanchard et al. 2010).

A macroeconomic benefit of reducing exchange rate volatility is an insurance system against asymmetric shocks caused by unreasonable exchange rate volatility. The fluctuation of exchange rates can be a source of asymmetric shocks themselves rather than a stabilizing instrument to correct for asymmetric shocks. Therefore, a monetary union can reduce asymmetric shocks by reducing exchange rate volatility and improve the insurance against such shocks (Mundell 1973).

Removing exchange rate volatility is beneficial for the EMU member countries. Without the existing system, another form of peg would be required, as the economies are highly dependent on trading with each other. Therefore the macroeconomic benefit of increased trade amongst the union members is an important gain from a membership. Rose (2000) estimated the average trade effect of monetary unions across time and between countries in a sample of 186 countries from 1970 to 1990. He used a dataset with more than 100 pairings and 300 observations where both countries use the same currency, including currency unions. He found that, on average, two countries that are members of the same currency union, trade three times as much with each other as countries that do not share a common currency, but with otherwise similar trading partners. Frankel (2010) investigated EMU's trade effect to see if this was indeed that case, which it was not, and he gave the larger size of the European countries, time lags as the euro is a new monetary union and endogeneity in deciding to form a monetary union as possible explanations for the lower EMU boost to trade.

A microeconomic cost from joining a monetary union are the various administrative, legal and hardware changeover costs resulting from switching to a new currency, such as adapting new vending machines and re-denominating contracts (Mongelli 2008).

The main macroeconomic cost of joining a monetary union is the forgoing of a national monetary policy, leaving only fiscal policy to the government's disposal. This cost arises because the countercyclical monetary policy response to an asymmetric shock is lost (Mundell 1961). A problem arises if the common interest rate, set by the common central bank, does not soothe all members at the same time. Harmonizing taxes and regulation can reduce this cost, as this process will reduce the risk of idiosyncratic shocks caused by national specific institutions (De Grauwe 2009). This is something the EU has done.

Another macroeconomic cost is the surrendering of the trade policy measure of manipulating  $E$ . This is related to the loss of an individual central bank in using the exchange rate as an automatic stabilizer for price and wage differences between regions. Since the

exchange rate instrument is lost, the adjustment back to potential production, e.g. after a demand shock, must happen through downward pressure on prices and wages. Under a fixed exchange rate, a country that needs to achieve a real depreciation to decrease its trade deficit or to get out of a recession cannot achieve this by expansionary monetary policy, as this is ineffective in the Mundell-Fleming model (Blanchard et al. 2010). To achieve a natural equilibrium adjustment under a fixed exchange rate regime in the medium run, a country needs to have lower inflation than the other members do for some time or to have deflation relative to its competitors. This will make the economy return to its natural level of output, but the process may be longer and more painful than under a flexible exchange regime. This is something that has occurred in Greece and Spain. Achieving real devaluation without being able to manipulate the exchange rate can require years of high unemployment (Blanchard et al. 2010). A devaluation can speed up the natural adjustment process as it stimulates aggregate demand, making output higher at a given price level. However, it can be difficult to achieve the right size of devaluation and hard to get all monetary union members to agree on this action. With EMU in mind, Mongelli (2008) argued that the magnitude of the above mentioned macroeconomic costs for each member country will depend on the individual economy's flexibility and adaptability.

The surrendering of an individual monetary policy also removes the ability to change the domestic money supply, i.e. a central bank that can provide liquidity by buying government bonds. In a non-member country, investors selling government bonds receive domestic currency, which must be exchanged before used outside the country. Money supply remains unchanged, as the new owners of the domestic currency will reinvest in the country. But for a country inside a monetary union, the lost confidence by bond holders can trigger an interaction between a liquidity crisis and a solvency crisis that can force the country to default in the event of a liquidity crisis (De Grauwe 2011). Sacrificing this lender of last resort opportunity for the central bank, can contribute to a destabilization of the financial situation in the country because it takes away the authorities' ability to intervene in the event of a liquidity crisis (De Grauwe 2011). If the country's bondholders fear a default and sell the bonds, the excess supply of bonds will raise in the interest rate. The government's ability to repurchase these bonds is lost, resulting in currency leaving the country and shrinking the money supply. De Grauwe (2011) argues that insolvency is more likely for members in a monetary union because they lack the possibility to issue debt in their own currency. This is costly for the particular nation, but also for the rest of the monetary union with its integrated capital market that is exposed to contagion.



Kenen (1969) argued that regions with high product diversification would benefit more from a currency union than specialization regions since the latter are subject to larger disturbances. Diversification reduces the need for manipulating  $E$ , making the costs of the lost possibility to do so smaller because highly correlated national output across the member states will reduce the need for exchange rate adjustments (Frankel and Rose 1998). But a common currency can lead to more specialization by increasing the concentration of industries in specific regions (Krugman 1993). This will reduce labor costs for firms but can increase the risk of asymmetric shocks, as many different specialized regions will have a diversified industrial structure leading to different business cycles (Krugman 1993).

### **3.2 Theory of optimal currency areas**

The necessary conditions to benefit from forming a monetary union are: (1) No barriers to trade in goods and services (McKinnon 1969); (2) labor and capital mobility (Mundell 1961); (3) symmetrical response to demand and supply shocks (Mundell 1961); and (4) a system of fiscal transfers (Kenen 1969; Mintz 1970). Conditions (1), (2) and (4) are required to stabilize the economy in situations when condition (3) does not hold, i.e. in the event of asymmetric demand or supply shocks. If member countries experience symmetric shocks the common central bank can offset the real economic effects by changing the policy interest rate. This will help smoothen the adjustment process towards the long-term equilibrium. Monetary policy cannot offset permanent shocks that require a change in relative prices for adjustments to take place.

McKinnon (1963) argued that the costs of surrendering the exchange rate as a policy instrument will be limited if the economies have a larger degree of openness to trade, as flexible exchange rates are less efficient in open economies. He used the ratio of tradable to non-tradable goods as a measure of openness. Accordingly those countries that are highly integrated through international trade and factor movements will gain the most from forming a monetary union. Having an integrated market of goods and services is important to help alleviate differences in the economies among the member states, as a fully integrated market will cause prices of goods and services to convergence, i.e.  $P_H = P_F$ .

Balassa's five successive stages of economic integration are the development of a free trade area; the creation of a customs union with a common external tariff; the formation of a common market with free movement of capital and labor; the establishment of an economic union with some harmonization of economic policies; and finally total economic integration

with a supranational authority that makes binding decisions. (Balassa 1961, cited in Laffan et al. 2000). The completion of these five stages should lead to an integrated market with free trade of goods as well as free movement of capital and labor. In addition, a unification of monetary, fiscal, social and macroeconomic policy is expected. These stages of integration should be covered among the potential members prior to forming a monetary union. Laffan et al. (2000) argued that a larger degree of harmonization of the national regulations than Balassa's common market is necessary for expanding to free trade in services.

A high degree of labor mobility among both skilled and unskilled workers is necessary in the forming of a monetary union because of the ability and necessity for factor movements to offset asymmetric shocks and price rigidities (Mundell 1961). Labor mobility is essential for harmonizing the domestic price of labor,  $(P_L)_H$ , with the foreign price of labor,  $(P_L)_F$ , i.e.  $(P_L)_H = (P_L)_F$ . Workers must be able and willing to move freely within and between countries. If unemployment increases in one area, the labor market will still clear as the unemployed will move to meet excess labor demand. Zemanek et al. (2009) argued that labor migration is the main mechanism through which the different states in the U.S. adjust to unemployment.

Wage flexibility can make the labor market clear in the presence of cultural, linguistic and legal barriers to mobility. This will increase the likelihood of the countries facing symmetric demand and supply shocks. Flexible wages and prices are necessary for the country to adjust the economy in response to external shocks because the exchange rate or interest rate cannot be used (Friedman 1953). The cost of joining a monetary union decrease considerably when prices are fully flexible (Bayoumi 1994). Price and wage flexibility as well as labor mobility is necessary to facilitate the adjustment if the shock is permanent, as fiscal transfers need to be of a temporary nature due to moral hazard incentives (De Grauwe 2009).

The cost of surrendering the possibility to adjust the exchange rate can be reduced if there is a high degree of financial integration between the members of a monetary union (Ingram 1962). Mundell (1973) gave the role of cross-country asset holding to be international risk sharing. Countries can mitigate the effect of asymmetric shocks by diversifying their income, creating a form of income insurance against temporary and permanent shocks when domestic inhabitants' holds claims of foreign dividend, interests and rental revenue. For this mechanism to work output must not be perfectly correlated across the countries.

Removal of barriers to capital flow can enhance the financial market integration through increased competition and harmonized national regulations, leading to more abundant credit and lower interest rates (Jappelli and Pagano 2008). In an integrated credit market, firms and

households should be able to borrow at the same conditions, irrespectively of the location of the bank. The mobility of labor and capital should lead to factor price convergence within the area, i.e.  $(P_K)_H = (P_K)_F$ . Financial markets are integrated when the LOOP holds, and this is when securities with identical cash flows are sold at the same price (Jappelli and Pagano 2008). Dunn (1978) gives the causes of net capital flows to be the different returns to capital in countries where capital per worker is scarce relative to countries where capital per worker is abundant, yielding higher returns in the former case. The scarcest factor of production ought to have the highest marginal return, causing that factor to move from where it is abundant to where it is rare to take advantage of the difference in returns. This will eventually cause the capital-labor ratios to converge as well, i.e.  $(\frac{P_K}{P_L})_H \approx (\frac{P_K}{P_L})_F$ , and is related to the country's stage in the development process. The less developed the country is, there will be larger gains from increasing capital, and when the country is sufficiently developed, it will be able to repay what it has borrowed. Jappelli and Pagano (2008) mentioned a potential cost of financial integration to be contagion between European banks and financial institution. Contrary to providing income smoothing through risk-sharing, the result can be increased output and consumption volatility.

Asdrubali et al. (1996) used data from 1983 to 1990 and divided the cross-sectional variance of each U.S. state's gross output into components, capturing the different sources of income smoothing of a shock. They found that 62 percent of idiosyncratic shocks in the U.S. were absorbed by the financial markets, divided into 39 percent by corporate savings and 23 percent by credit markets. The federal budget absorbed 13 percent and the remaining 25 percent were not smoothed. When they applied the same approach to the EU and the OECD from 1966 to 1990, they found that the unsmoothed residual was about 60 percent. They found that half of income risk smoothing came through national government budget deficits and the other half through corporate savings.

The cost of forsaking an independent monetary policy decreases if the member countries have large co-movements of output and prices (Mongelli 2008). Potential member countries should be in similar business cycles prior to forming a monetary union. The more synchronized the business cycles among the member countries are, the lower the probability of asymmetric shocks, and thus the less painful the loss of independent monetary policy and of a flexible exchange rate for the member country. Asymmetric shocks might occur because of non-harmonization of the business cycles in the monetary union (Bladen-Hovell 2007). Asymmetric shocks can be caused by structural differences between member countries, i.e.

different patterns of industrial specialization. The risk of an asymmetric shock is lower if member countries' trade belongs to the same production sector, i.e. where trade is largely intra-industry and not inter-industry trade, consisting of different products (Blanchard et al. 2010). A high degree of business cycle correlation makes the single monetary authority better equipped to conduct a common monetary policy (Bladen-Hovell 2007). Frankel and Rose (1998) argued that monetary integration would increase trade integration and thus achieve cyclical convergence between the participating countries after joining EMU.

Kenen (1969) suggested that fiscal integration would reduce the cost of surrendering the policy instrument of flexible exchange rates. The damaging effects of a negative demand shock could be softened by transfers from prosperous regions to those less prosperous if neither labor mobility or wage flexibility absorbed the shock. This is why a fiscal union with a centralized budget is one of the important criteria for an optimal currency area. Fiscal transfers, through a system of tax collection and subsidies, or a lump-sum transfer, between areas booming and areas in recession can make up for the asymmetry of the shock. Artis (2007) argued that a redistributive fiscal system would automatically raise the effective average tax rate in the booming region and lower it in recessionary one. This allows consumption to be protected to some degree from the impact of the primary income change by an asymmetric shock. He argued further that the financial system might do this job in EMU, as the EU does not have a system of fiscal transfers. Transfers can create an incentive for moral hazard as the pressure to adjust is reduced in the regions receiving transfers. This can lead to the transfers becoming permanent (De Grauwe 2009).

To achieve a smooth market interaction among sovereign states the harmonization of the national legal systems and commercial law is necessary (Mintz 1970). Both the financial market and the labor market would be brought closer together by removal of the national institutional features. To ensure compliance with the joint commitments, to sustain cooperation on the different economic policies, and to encourage more institutional linkage the potential member countries should have implemented similar policies prior to joining a monetary union (Mongelli 2008).

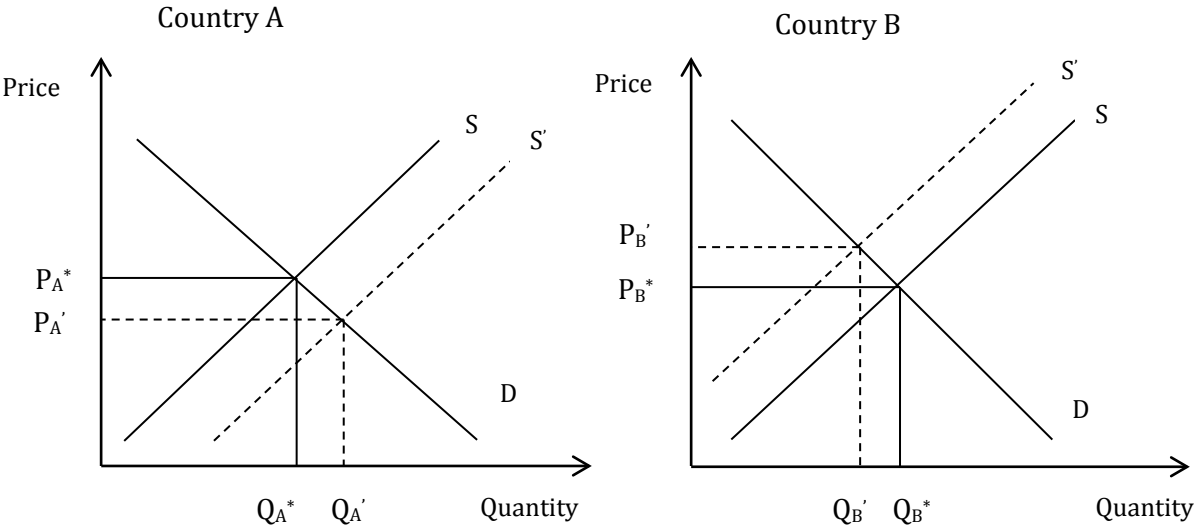
### **3.3. The automatic stabilizing mechanisms in a monetary union**

The adjustment process when facing a negative demand shock can be painful in the short run under a fixed exchange rate regime. Since monetary and fiscal policy is equal at the outset for the member countries, other changes are necessary if the inner balance is disturbed. The

changes can be to increase trade between the member countries, or a third country. Another possibility is to increase wage and price flexibility and to increase labor and capital mobility.

Trade in goods should lead to factor price equalization, according to Venables (2007), if all countries have the same efficiency levels, all industries are perfectly competitive and operate under constant returns to scale, and trade is perfectly free. Production will move to a location where factor prices are cheap, bidding up their prices until, in equilibrium, factor prices are the same everywhere. Economic integration will thus bring about convergence in factor prices. Factor price equalization, trade and labor migration will act as transmission channels for relative wage adjustments (Zemanek et al. 2009). Improving mobility or flexibility is a more robust adjustment process that will strengthen the countries future ability to handle shocks. Labor and capital mobility will help facilitate this process, as the movements of these factors serve to smooth the adjustment process to external supply and demand shocks.

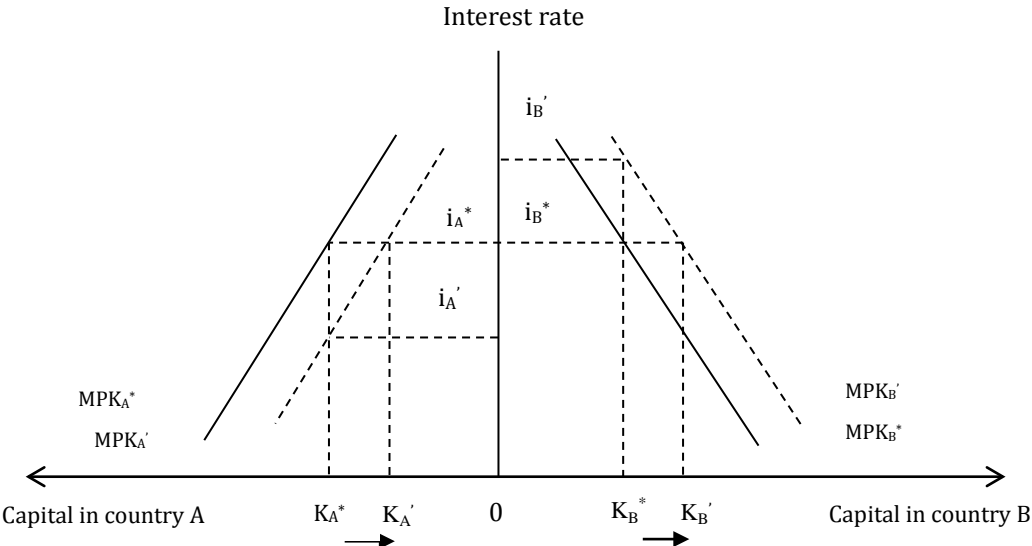
Figure 3.2 illustrates the automatic adjustment process back to equilibrium caused by trade in the event of an asymmetric supply shock, e.g. changes in production costs or changes in the price of oil. Price is on the vertical axis, while quantity traded is on the horizontal axis. Initial domestic equilibrium in country A is where price equals quantity,  $P_A^* = Q_A^*$ , and initial domestic equilibrium in country B is where price equals quantity,  $P_B^* = Q_B^*$ . The asymmetric shock makes the supply curve shift outwards in country A but shift inwards in country B. Excess production of the good prevails in country A, as the demanded quantity remains unchanged. The price in country A decreases from  $P_A^*$  to  $P_A'$ . Country B experiences the opposite development with lower production and an unchanged demand curve, causing the



**Figure 3.2** The adjustment to equilibrium through trade from an asymmetric supply shock. Source: De Grauwe (2009).

domestic price to increase from  $P_B^*$  to  $P_B'$ . The new price in country B is higher than the new price in country A, causing excess demand for the now under-supplied good in country B. Trade will eliminate these differences as the excess production in country A can be sold in the foreign market. The prices will converge, restoring the former equilibrium prices in both countries. This is how export and import serves as an automatic stabilizing mechanism against this asymmetric supply shock. The same mechanism will occur in the case of a demand shock, only the demand curves would shift.

The situation in figure 3.3 illustrates difference in interest rates on capital between country A and country B after an asymmetric technology shock that shifts the marginal product of capital outwards in country B, from  $MPK_B^*$  to  $MPK_B'$ , while it shifts inwards in country A, from  $MPK_A^*$  to  $MPK_A'$ . The initial situation illustrates equilibrium in the capital market between country A and B with the market-clearing interest rate equal at  $i_A^* = i_B^*$  and the level of capital in each country at  $K_A^* = K_B^*$ . After the asymmetric shock more capital could be used at every interest rate in country B than in country A, making country B more attractive for investments, because of the now lower interest rate  $i_A'$  in country A and the higher interest rate  $i_B'$  in country B, if the level of capital is kept constant. Investors taking advantage of the arbitrage opportunity will move capital from country A to country B, decreasing the amount of capital available in country A from  $K_A^*$  to  $K_A'$  and increasing it in country B from  $K_B^*$  to  $K_B'$ . After a sufficiently large amount of capital has moved between country A and B, the rate of return in the two countries will be equal at the new marginal productivity of capital, making investors indifferent to whether their assets are held in country A and country B. This will

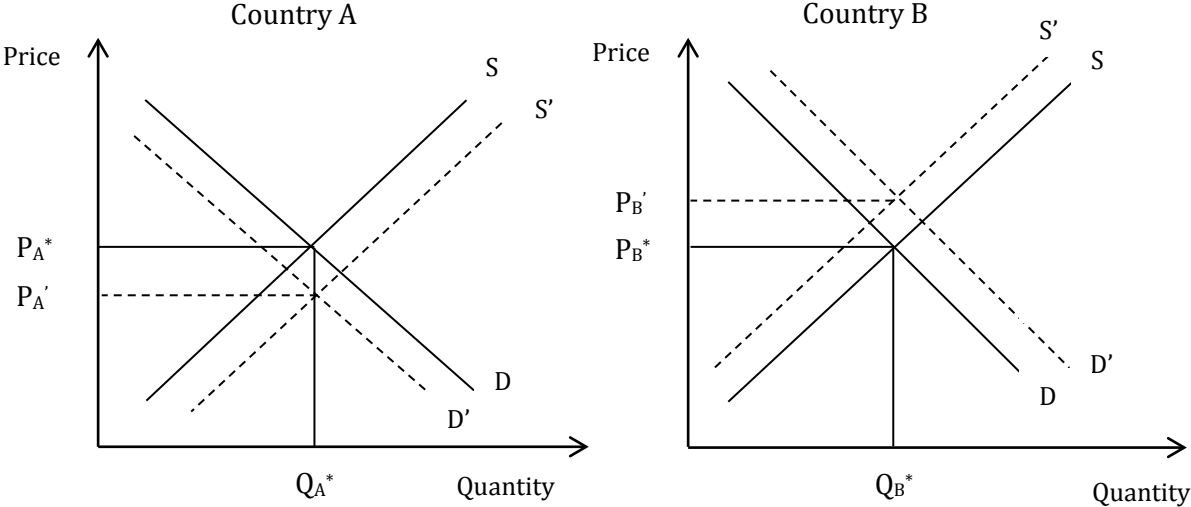


**Figure 3.3** Restoration of equilibrium in the capital market from an asymmetric shock. Source: Dunn (1978).

restore equilibrium at  $i_A^* = i_B^*$  (Dunn 1978), and can be transferred to how the marginal product of labor serves as a stabilizing mechanism between countries in the process of facilitating movement of labor.

Bajo-Rubio and Díaz-Roldán (2003) argued that the surrendering of monetary policy will require another form of policy measure to respond to an asymmetric shock. In the short run, fiscal transfers from a supranational source can help if an area of the union is unable to restore balance. A centralized budget with automatic transfers to areas that need social insurance will smooth the process in the immediate aftermath of the shock. Transfers thus work as an insurance scheme against temporary shocks within the union.

Figure 3.4 show how fiscal transfers can correct the asymmetry. Initially, country A and B are at domestic equilibriums, i.e.  $P_A^* = Q_A^*$  and  $P_B^* = Q_B^*$ . If country A experience a boom, the supply curve in A shifts outwards, and the country is consuming more. If, at the same time, country B contracts, the supply curve shifts inwards, the price increase and consumption decrease. The countries experience an asymmetric shock, but if the government taxed consumption in country A, the demand curve would shift inwards, restoring the equilibrium quantity. Having implemented a supranational body that can manage this transfer system, would enable a transfer of the tax revenue to country B. If the transferred revenue is used to subsidy consumption, the demand curve would shift outwards, restoring the equilibrium quantity consumed prior to the asymmetric supply shock, at the same prices. For this to occur, the tax in country A must equal  $T_A = (P_A^* - P_A') * Q_A^*$ , and the subsidy in country B must equal  $S_B = (P_B' - P_B^*) * Q_B^*$ .



**Figure 3.4** Fiscal transfers correcting after an asymmetric shock.

A depreciation of the nominal exchange rate can decrease the BOT deficit in a flexible exchange rate regime. In a fixed exchange rate regime the country must improve its competitiveness relative to foreign substitutes by internal adjustments, e.g. increasing productivity. Lower production costs and wages relative to its trade partners can increase net exports through a depreciation of the real exchange rate.

Improving an unsustainable current account deficit or surplus will, depend on the underlying cause. Shrinking the deficit can be done through better competitiveness, by decreasing the budget deficit or by decreasing investments and increase private saving (Kenen 2000). A real wage depreciation increases competitiveness and can lead to an improved current account in the deficit countries if exports grow while domestic demand is kept unchanged, or decline. An internal depreciation improves the balance of trade, and thus the current account, because nominal prices are slow to change, and are sticky in the short run (Parsley and Wei 2001). This price rigidity occurs because contracts are made in nominal prices, and firms costs are in nominal prices. For the depreciation to have an effect, it must be combined with contractionary fiscal and monetary policy, as this will dampen domestic consumption of both imported and locally produced goods, while fuelling exports.

### **3.4 The harmonizing of policies in a monetary union**

The implications of interest parity for a fixed exchange rate regime, is that foreign countries interest rates will be imported. However, because the interest parity condition needs to hold in the foreign exchange market equilibrium, a flexible regime also requires equality between the domestic and foreign interest rates. Otherwise, capital inflow or outflow will cause the nominal exchange rate to change. Freedom to conduct monetary policy decreases because of the need to harmonize the interest rate with the trade partners. The cost of surrendering the monetary policy when joining a monetary union might thus not be large in the long run, if monetary policy is effective in the short and medium run.

Fiscal policy is also surrendered to a certain degree, as increased government spending will increase the home interest rate, but because the interest rate parity condition needs to hold, increased domestic interest rate will cause disequilibrium in the foreign exchange market. With monetary and fiscal policy surrendered, adjustments to external shocks have to be made internally. If world prices change, particularly small countries would need to change prices to keep up. Participating countries need to keep reserves for protection in case of capital outflow and to be able to change the money supply to achieve the target exchange rate. In addition, if



a country has a large degree of capital mobility, keeping the real exchange rate equal to the specified target is more difficult. High capital-mobility can lead to asset price bubbles (Rogoff and Reinhart 2009). A solution to this can be to impose capital controls or increased foreign exchange reserve requirements for the central bank. However, capital controls contradicts the foundation of the single market.

In absence of a centralized budget in a monetary union, members would need to have a flexible national fiscal policy in response to a negative demand shock (De Grauwe 2009). However, fiscal policy is not a flexible instrument, as deficits have to be financed and debt repaid by running surpluses on the primary budget. It can be hard to lower debt from previous shocks, and implementation of new stimulus measures can lead to an unsustainable high debt level. To finance current expenses, the government might have to raise taxes and implement austerity measures in the midst of a recession. The Mundell-Fleming model for an open economy with a fixed exchange rate predicts increased output, interest rate and appreciation of the exchange rate in the short-run if government spending is increased (Blanchard et al. 2010). Higher interest rate and exchange rate will eventually lead to lower demand, offsetting the boost on output. In a monetary union the possibility to offset the contractionary effect on output with an expansionary monetary policy is lost. When the country wants to decrease the deficit, higher taxes or spending cuts is necessary. This illustrates that fiscal policy is not flexible, and that fiscal stimulus policies cannot be maintained over a long period.

### **3.5 How converged is the EMU?**

The process that led to a monetary union in Europe started with the development of the Steel and Coal Community between Belgium, Germany, France, Italy, Luxemburg and the Netherlands in 1951, leading to the European Economic Community (EEC), formalized by the Treaty of Rome in 1957. The treaty contained a common market as both a customs union and the four freedoms, i.e. free movement of goods, services, capital and labor, were included (Laffan et al. 2000). It was first suggested to work towards monetary integration in Europe in the years after the EEC was established, and at a conference in The Hague in December 1969 a plan was agreed on by the attending heads of states to start planning the stages for creating an economic and monetary union (Issing 2008). A common currency was seen necessary in facilitating the single European market with exchange rate stability and without the transaction costs associated with converting currencies (Krugman and Obstfeld 2006). This was viewed particularly important when opening up for free capital movement across

European borders, as a system with irrevocably fixed exchange rates would make the gains from this mobility larger. The Hauge meeting led to the Werner-report in 1970 that set out a plan to realize an economic and monetary union in the ECC by 1980. In 1988 a committee, led by Jacques Delors, was constituted by the European Council to make proposals for the realization of the EMU. The committee's report led to the decision of the three stages of the EMU implementation in 1989.

The formal process of the monetary policy integration in Europe started in June 1990 when the first of the three stages of EMU was launched. The first stage entailed a complete freedom of capital movements across the EEC as well as removal of the remaining barriers to trade in goods and services. Large amendments to the Treaty of Rome were agreed on at the Maastricht-meeting in December 1991, strengthening the European market by further reducing the barriers to trade and harmonizing both intra- and inter-trade policies. The Maastricht treaty became binding from 7 February 1992. In January 1994, stage two was entered. The European Monetary Institute (EMI) was established, which coordinated the individual nations monetary policies, strengthened the cooperation amongst the national central banks and prepared for one common central bank. The final stage of EMU started in January 1999 when the exchange rates of the 11 member states' currencies were irrevocably fixed and the responsibilities of the EMU-wide monetary policy was transferred to the ECB (Mongelli 2008).

### ***3.5.1 Intra- EMU trade and price convergence***

Within the EMU, the abandonment of national currencies eliminated all costs associated with the exchange of currencies. It was also expected to raise transparency, cut transaction costs and narrow the scope for deviations from the LOOP. In addition, the fixed and variable costs facing exporting firms should decline. The European Commission estimated a reduction in transaction costs between 0.25 and 0.5 percent of EU GDP per year (Blanchard et al. 2010).

The EMU member countries were closely interlinked through high volumes of trade and economic interaction prior to joining the monetary union. Mongelli (2008) investigated the level of economic integration between 1957 and 2008 in the six founding countries of the EU, by following Balassa's five stages of economic integration. He found that all the stages have been covered since 1957, and that the overall index of integration, running from zero to 100, had reached 90 for the six founding countries in 2008. A sub-index for monetary and financial integration only reached 30. He presented tests where economic integration Granger causes

trade deepening to a significantly higher degree than the other way around and confirms this result by applying a Vector Error Correction Model.

According to Krugman and Obstfeld (2006), intra-EU export accounted for between 10 and 20 percent of total export for most of the EU member countries in January 1999. This amount is smaller than the volume of trade between regions in the U.S. They argued that the volume of trade itself was not enough to declare EMU to be an optimal currency area. However, the volume of intra-EU trade has increased after 1999. Micco et al. (2003) found evidence of increased trade between pairs of the first twelve EMU members, in a study from 1999 to 2002. They found a 4 to 10 percent increase in intra-EMU trade among its members when compared to trade with other countries, and between 8 and 16 percent when compared to trade among other countries. Baldwin (2006) found the intra-EMU trade effect to be between 5 and 10 percent and that this effect might vary from country to country and industry to industry. Bun and Klaassen (2007) estimated the EMU-effect to only 3 percent. Frankel (2010) reviewed a large number of studies from the first EMU years and argued that “Overall, the central tendencies of these estimates seem to be an effect in the first few years in the order of 10 to 15 percent” (p. 170).

Engel and Rogers (2004) found a significant intra-European decrease in price dispersion throughout the 1990s, in a dataset from 1990 to spring 2003. They found no significant price convergence after January 1999 and argued this indicates that much of the price convergence took place in the early 1990s. In addition to this, it might be too soon to see a further effect in their sampled data. Rogers (2007) provided evidence of a large price convergence among the 11 original EMU countries taking place in the early 1990s. This was especially true for the tradable goods, non-tradable goods had larger price dispersion. He found that the price dispersion of traded goods in the EMU has been close to that of the U.S. since the late 1990s. Fischer (2009) used data of the actual paid price and sales volumes of 90 percent of sold washing machines in 17 European countries, where 11 are current EMU members, between 1995 and 2005. He found statistically and economically significant deviations from the LOOP, as the washing machine prices did not converge across EMU members. He cited potential reasons for the divergence to be differences in the distribution costs across the sample countries, leading to diverging mark-ups among the retailers.

Price harmonization has come further in merchandise goods than in commercial services, causing a large potential benefit from enhanced cross-country competition in services (Mongelli 2008). Parsley and Wei (2001) found that price differentials are particularly small

in those currency unions which have existed for a long time. They argue this was the case between Belgium and Luxemburg, as the countries have had a common currency since 1922.

The indication of the presented evidence is that despite some price dispersion still being present in the EMU, a large degree of price harmonization was undertaken during the 1990s. In addition, trade has been enhanced following the creation of the EMU.

### ***3.5.2 Labor and financial market integration***

The single market legislation endured common policies for labor and capital. In 1998 the Schengen Agreement on removal of border controls in Europe was put into force. However, Krugman and Obstfeld (2006) stated that the cultural and linguistic differences in Europe pose greater barriers to mobility across European borders than between states in the United States and argued that the lower mobility within Europe is due to government regulations. It is difficult to move to meet excess labor demand as many countries require establishment of residence prior to being eligible for unemployment benefits. This will dampen the incentive for people to seek work far away from their current residence.

OECD (1999) found geographical mobility to be between two and three times higher in the U.S. than in Europe. Janiak and Wasmer (2008) reviewed several pre-EMU studies that showed how Europe responds to less jobs in one region by lower labor market participation and not by higher migration as in the U.S. More recent studies revealed that labor mobility increased in the core-EMU period, but is still below the U.S. level. They found European households to be three times less likely to move when faced with the same type of shocks as the U.S. households. They cited the causes behind the lower mobility in Europe to be rigidities, e.g. housing market rigidities.

Venables (2007) stated that there are significant wage differences in EMU despite the enhanced opportunity of factor price convergence made possible by the single market. He argued this is due to trade frictions, such as transportation costs, and that this offers the more centrally located areas a major advantage. Lane (2006) cited non-coordinated pension systems and entitlement systems as another reason why there is lower mobility in the EMU than in the U.S.

In EMU, the barrier of exchange rate risk and converting money has been removed but there are different tax systems in the respective countries, causing differences in returns depending on where investments were made. Differences in regulation and enforcement can also hamper the cross-border integration by posing barriers to entry for foreign banks. In

addition, domestic banks have local knowledge of firms and households, giving them an advantage in the credit market that also can create entry barriers for foreign banks.

Jappelli and Pagano (2008) found that the public bond market experienced a larger degree of integration relative to the corporate bond market and the stock and credit market, and that the money and public debt markets integrated immediately after the euro was launched. The reason for the incomplete integration was the heterogeneity of borrowers and asymmetric information between local and foreign lenders, as the legal rules are quite homogeneous. De Grauwe (2009) argued that the government bond market is more integrated than the corporate bond market because of different legal systems, e.g. corporate tax systems, accounting rules, shareholders' rights, and takeover laws, and suggested more centralized regulation and supervision. Gropp and Kashyap (2010) also found incomplete integration in the European retail banking market and this makes the European market very different from the U.S. market. Lane (2006) investigated the macroeconomic effect from the increased financial integration to answer if cross-border risk sharing and consumption smoothing had improved, and found that the degree of risk sharing remained limited. A large part of households' aggregated wealth was housing assets, dominated by domestic owners, counteracting the convergence from the more integrated capital market.

Given this evidence, it can be inferred that real obstructions to labor mobility is present and that the degree of financial market integration might not be strong enough to serve as insurance against asymmetric shocks despite being strongly integrated in some areas.

### ***3.5.3 Business cycle harmonization***

Frankel and Rose (1998) argued that EMU membership could increase intra-EMU trade allowing business cycle to become more synchronized. Padoan (2001) provided evidence that the European business cycles moved closer together after the decision to form a monetary union. Research by Giaonne et al. (2010) divided the founding EMU countries into two groups: a core group consisting of Germany, France, Italy, the Netherlands, Austria, and Belgium, and a periphery group consisting of Spain, Portugal, Ireland, Finland, and Greece. The core-EMU countries that had similar levels of per capita GDP in the 1970s, had experienced similar business cycles, and no significant change was associated with joining EMU. These countries business cycles had been less correlated with the rest of the EMU throughout the period. The periphery countries had levels of economic activity that were more heterogeneous prior to joining EMU, and their economic activity had been more volatile. They found that Spain had converged towards the core group, while Greece had not, and

argued that the lost exchange rate instrument and monetary policy had almost no effect on output correlation across countries.

By examining macroeconomic variables Holinski et al. (2012) tested for economic convergence between one group consisting of Greece, Ireland, Italy, Portugal and Spain and another group consisting of Austria, Finland, Germany and the Netherlands. They found divergence between the two groups and argued the reason for this was the development of a negative BOT in the former group. They concluded that the expected economic convergence did not occur.

The U.S. is a well-functioning currency region, and if EMU is similar to the U.S., it will be more likely to prosper in the long run. ECB's former president, Jean-Claude Trichet, gave a speech (27 August 2011) where he evaluated the differences and similarities between the EMU and the U.S. He presented evidence that since 1999 the aggregated euro zone had a yearly per-capita growth rate of around 1 percent compared to 1.1 percent in the U.S and argued that the two regions are similar. Kouparitsas (2001) investigated whether the United States is an optimal currency region by dividing the country into eight regions, and looking at their business cycles in each quarter between 1969 and 2002. The author found that five of the regions within the country experienced similar sources of economic disturbance, as well as similar response to the disturbances. Three of the regions experienced significant deviations from the above regions in the sources of disturbances and in the response to the disturbances. He thus divided the areas into a core-group that met the criteria for an optimal currency region and a non-core group that did not. Blanchard et al. (2010) argued that the 50 states in the U.S. experience difference shocks, but that the labor mobility across the states is high enough to counteract the effects.

This evidence indicate that the business-cycle harmonization has not been strong enough to cousin asymmetric shocks, but that this might pose less problems as the U.S. also seem to be divided into core and periphery regions, experiencing different shocks.

#### ***3.5.4 A system of fiscal transfers***

The SGP gives the EMU a common framework regulating the fiscal deficit and debt but the national budgets are left to the domestic governments. The lack of a common centralized budget removes the possibility of fiscal transfers to smooth the short-term adjustment to asymmetric shocks. Krugman and Obstfeld (2006) argued that a fiscal federalism like the system in the U.S. could help offset the economic stability loss due to fixed exchange rates.

Laffan et al. (2000) argued that the necessary degree of harmonization of national regulation in Balassa's final stage of economic integration might have been overestimated, giving the creation of EMU without a federal administrative center as an example. De Grauwe (2006), on the other hand, argued that the absence of a common fiscal policy is a serious flaw that has to be fixed if EMU is to survive in the long run. This is supported by Tsoukalis (2012) that stated that EMU needs to move further towards a fiscal union. Research by Kim et al. (2012) provided evidence for fiscal problems in a single-currency area without a fiscal federalist system. Beck and Prinz (2012) introduced an "impossible trinity" for a monetary union, where it is not possible to have a union-wide independent monetary policy, national fiscal sovereignty and a no-bail out clause at the same time. They suggested that the choice of two out of the three make it is necessary to let the national fiscal sovereignty go.

Rockoff (2000) stated that it took the U.S. a minimum of 150 years to meet the criteria for an optimal currency region and that this did not happen until the country implemented a system of fiscal transfers and deposit insurance in the 1930s. Prior to this implementation, the individual states suffered from having a common currency but state-specific shocks. Rockoff emphasized the importance of monetary unions' adopting the same institutions that the U.S. implemented in the 1930s.

According to Fuest and Peichl (2012) the future of the euro zone is not dependent on a fiscal union. They suggested that decentralized responsibility for government debt could be preserved and instead focused on reforming the financial sector, and induce more wage and price flexibility. The former is to make sure that banks can absorb the losses in the event of government insolvency, and the latter to compensate for the lack of a fiscal transfer system to absorb macroeconomic shocks. This removes the need for "achieving a higher degree of political integration in Europe which seems far from anything that can realistically be achieved, and find democratic support in the near future". They made the point that federal states in the U.S. also incur deficits as these states have issues with fiscal stability as well. The U.S. has no guarantee for state debt, and insolvencies of municipalities and states occur. They argued that the intentional set up in the EMU would have been okay and that no bailout would be needed if the financial sector had been robust enough to absorb an insolvency.

The examination of how well the EMU fulfill the necessary criteria for a common currency area to function highlighted the need for a more flexible labor market. The convergence among factor prices seems to have taken place, as well as in commodity prices. This is true to a lesser extent for the price of services. Examining the business cycles seems to divide the EMU into a core and a periphery zone, but comparison to the U.S. nuanced the severity of this

feature. The EMU do not have a system of fiscal transfers and the presented evidence argues strongly both in favor of implementation and against it. However, as pointed out by Fuest and Peichl, a federal system is not realistic with the high degree of political autonomy in the EMU. The presented examination of the optimal currency area criteria suggests that the EMU fulfills the criteria to a satisfactory degree.

This chapter presented the theoretical aspects of what needs to be fulfilled for the benefits to outweigh the costs of surrendering an autonomous monetary policy and the policy instrument *E*, and joining a monetary union. However, the presented data in chapter 2 displays large internal and external imbalances among Germany and the three southern countries, despite the review in section 3.5 which demonstrated that intra-EMU trade has increased and that prices have converged. Dispersion still exists, especially in service prices. It identified problems with labor mobility in averting asymmetric shocks. It nuanced the need for a federal fiscal transfer system when the capital market works efficiently. Regardless of how well or unwell the EMU preforms with respect to these criteria, imbalance has developed that the theory have not addressed. These are BOT deficit and surpluses, budget deficit and surpluses, and banking sector trouble, indicating that more than what is presented here is necessary for a well-functioning monetary union. Answering whether these problems have country-specific domestic roots, or whether the monetary union's failure to address these issues have contributed to them, requires the analytical framework outlined in chapter 4 and the country-specific case-study performed in chapter 5.



## 4. Analytical framework

Examination of the criteria in chapter 3 showed a satisfactory degree of fulfillment of the optimal currency area criteria among the EMU countries. However, imbalances still developed within the monetary union, suggesting that something is left unaddressed by the theoretical framework. Identifying what is politically missing from EMU, and how that affects the countries, will help explain why the imbalances developed. The following section presents the identified practical problems in the EMU without making a definitive judgment on what created the difficulties in the euro zone, as that is left for the case study in chapter 5.

### 4.1 Practical problems in the EMU

#### 4.1.1 Public finances

The EMU consists of sovereign states that surrender their monetary policy to a supranational body while keeping an autonomous fiscal policy. The theory does not outline what is the problematic amount of government spending ( $G$ ), fiscal deficit ( $G-T$ ), deficit relative to GDP ( $(G-T)/GDP$ ), and debt relative to GDP. However, internal imbalances caused by frivolous fiscal expenditures in one member country could cause harmful cross-border spillover effects, potentially threatening financial stability in the whole euro zone due to contagion between European banks holding government bonds across countries. Joining the EMU could thus increase the countries' fiscal discipline. Or, on the contrary, it could decrease the fiscal discipline, as the interlinked ownership of the European government bonds contains an implicit bailout-promise. The latter identifies a moral hazard problem, which is in favor of a monitoring mechanism such as the SGP (Baimbridge et al. 2012). The fiscal policy in EMU has been mildly pro-cyclical between 1999 and 2007 (Fatás and Mihov 2010).

Debt is not a bad construction. Lending and borrowing is necessary when governments need to make large investments they cannot finance within the primary budget. For mature economies with ageing populations, building up foreign assets may be an effective way of funding future consumption. However, if the government runs a large deficit, it will decrease the availability of domestic funds, crowding out productive investment and create a need for external financing (Dunn 1978). Long-term solvency implies that countries cannot continue to increase their debt faster than their revenue. The higher the debt, the higher the primary surplus ( $G-T$ ) is needed to keep the debt stable. Borrowing to pay down public debt is not sustainable and instead requires higher government revenues.

The debt-to-GDP ratio in the SGP is based on the output growth rate. This growth rate needs to be larger than the real interest rate in order for the debt-to-GDP ratio to decline from year to year (Blanchard et al. 2010). It is thus easier to reduce public debt when the economy is growing. However, increased growth becomes difficult if the government expenditures was not allocated to productivity increasing investments, or not allocated to investments at all. Chapter 5 will investigate the sample countries debt structure in greater detail.

#### ***4.1.2 BOT surplus and deficit***

The internal imbalances led to external imbalances. The increased financial market integration allowed some countries to run larger external deficits than what was feasible prior to the EMU membership, as investors previously required larger risk premiums to fund deficits (Lane 2006). From equation (2) in section 2.2.1 it is evident that a fiscal deficit reduces the BOT, and if the gap between private savings and domestic investments become negative, the BOT also declines. Figure 2.4 in section 2.2.1 demonstrates how the BOT is a part of the current account balance and also a part of the BOP, which means that a BOT deficit translates to a current account deficit. Current account imbalances can be problematic in a currency union as adjustments to regain competitiveness must be made internally due to the lost possibility of exchange rate manipulation. Internal adjustments can be particularly painful if forced by a sudden stop in foreign financing (Jaumotte and Sodsriwiboon 2010).

Kenen (2000) argued that it is more serious to have a current account deficit caused by lowered private and public saving than from increased investments, as the latter means the country is accumulating capital that will contribute to increasing future output, given efficient investment. This will affect the country's long-term growth prospects because a current account deficit means the country is borrowing resources from the rest of the world that it will have to pay back in future. This is not problematic if the loans go to profitable investments (Krugman and Obstfeld 2006).

A current account surplus is, in the same manner, not a problem if the excess domestic savings are being invested more efficiently abroad, generating higher returns than possible if invested domestically. Krugman and Obstfeld (2006) argued that countries with surplus savings and weak domestic investment opportunities should invest in those foreign countries better suited to generate future output from current output. The imbalances on the current account will be reversed in the future if the investments generate sufficient profits to repay the loan with interests. They also argued that a current account deficit could be helpful in

smoothing consumption in the case of adverse events, as the possibility to lend from abroad provides insurance by allowing intertemporal trade.

However, problems with an excessive current account deficit could emerge. Kenen (2000) argued that if the deficit were used to finance current consumption rather than investments, future profits for the repayment of the loan or the interests would not be generated. If the foreign financed domestic investment projects do not generate sufficient profits to repay the loan, a deficit would place the country in a risky position. Krugman and Obstfeld (2006) argued that a country could run into trouble if the deficit is due to “temporarily high consumption resulting from misguided government policies or some other malfunction in the economy” (p. 490). The problem can become serious if the deficit is caused by government overspending, as continued lending from foreign investors can be discouraged. In a country dependent on foreign funds, a lending crisis could emerge if foreign creditors stop being willing to fund domestic consumption. Households and firms that fail to serve their liabilities will weaken local banks’ ability to serve their foreign creditors. The country must rely on short-term borrowing or running down reserves to handle its liabilities. It can face insolvency problems if the lost creditor confidence increases the banks’ borrowing costs making both refinancing of existing debt and new loans costly. In the worst case scenario the number of households and firms unable to serve their liabilities surpasses a certain unknown threshold causing threats of a domestic banking sector collapse.

If a country accumulates current account deficits over many years, domestic debt and foreign ownership of assets will increase. Fiscal consolidation, i.e. increasing net public savings, will decrease the deficit and so will an improved trade balance and increased policy interest rate. The contractionary tendencies from these measures combined will worsen the internal situation if the deficit country is experiencing high unemployment and slow economic growth (Appleyard et al. 2008).

A current account surplus means that the country is accumulating more output than can be absorbed by domestic consumers or investors. The excess assets are invested abroad, contributing to growing claims in foreign countries. An excessive current account surplus can cause problems if the domestic investment level is lower than what is needed to maintain a sustainable capital accumulation and to keep or improve the productivity level. Benefits from greater domestic investments are potential revenue from taxation and potential lower unemployment due to capital accumulation, leading to higher GDP (Krugman and Obstfeld 2006). In addition, investments made by a domestic firm may have positive spillover effects on other domestic firms. More importantly is the potential failure of foreign borrowers to

meet their future liabilities. If the domestic surplus reflects excessive foreign lending, the home country may find itself in a position where it will not receive the invested money. It may thus lose the parts of its future wealth held by foreign countries, affecting the level of national wealth (Krugman and Obstfeld 2006). In addition, like the on-going China-U.S. debate, excessive current account surpluses may lead to retaliations and demand for appreciation of the currency, if the trading partners perceive it to be too low. This can lead to discriminatory protectionism measures. Considering the issues discussed above, governments should aim for external balance by avoiding excessive deviations in either direction.

The southern EMU members had lower income per capita than the northern members and therefore a high degree of investment was necessary in these countries to catch-up (Jaumotte and Sodsriwiboon 2010). However, the declining labor productivity displayed in section 2.3 indicates that the majority of the capital inflow in the core-EMU period were not efficiently invested.

#### ***4.1.3 Unemployment and labor mobility***

In Spain 46.4 percent of the work force between the ages of 15 and 24 was unemployed in 2011, while the corresponding number in Greece was 44.4 percent and 29 percent in Italy. The equivalent unemployment rate in Germany was 8.6 percent in 2011 (Eurostat 2012).

Padoan (2001) found evidence of the unemployment rate being positively influenced by the rate of unemployment compensation. He listed supply-side causes of unemployment to be related to the availability, replacement rate and duration of benefits. The wage level supported by unions can decrease the opportunities of the jobless. On the demand-side, factors that will boost firing and hiring costs and factors that raise capital intensity per unit produced contribute to unemployment. The same will be true for labor taxation, technical progress and market power of firms. He concluded that the greater the rigidities, the more unemployment increases and that the European rigidities are the main source of rising unemployment

Research by Boysen-Hogrefe and Groll (2010) found that increased unemployment in EMU after the 2008-09 recession was correlated with rising unit labor costs in the period prior to 2008, when they compared the changes in employment in OECD countries in 2009 with their unit labor costs prior to the crisis. OECD countries with high growth in both internal demand and unit labor cost prior to 2008 experienced a greater increase in unemployment than the countries with a modest unit labor cost growth. In the years preceding the financial crisis many countries experienced wage growth in the non-tradable sector, such as housing and construction, and the pre-crisis increase in unit labor costs was a result of this

prosperity in the non-tradable sector. The authors found that lower unit labor costs in Germany before the crisis explained the low unemployment rate and that real German wages have not changed significantly since 2003. The demand for labor has been high and the above mentioned factors caused unemployment to drop.

According to Bräuninger and Majowski (2011), migration will be a good way for the young unemployed to hinder a deterioration of their skills and allow them to return home better qualified while their native countries undertake structural reforms. The younger and better educated inhabitants in EMU are more likely to move for work. However, the adjustment so far has been driven in large part by non-EU residents. The authors presented data from the period after the financial crisis demonstrating that migration has increased from the periphery countries to the U.K., but not to Germany. They estimated that migration into Germany is likely to increase in the coming years due to the high unemployment in the periphery EMU countries and that specifically Greek, Spanish and Irish immigrants would move to Germany.

The high unemployment among the group that is most likely to move for work, suggests that there are barriers limiting mobility in Europe. Janiak and Wasmer (2008) argued that high unemployment benefits and weak active labor market policies tended to deter labor mobility, as well as inefficient housing markets and the limited portability of pensions across borders. Eichengreen (2010) argued that the lack of mutual recognition of professional qualifications, the non-portability of pensions and that the receipt of social services depends on having an established residency, hinder labor mobility across EMU. In addition, competition with labor abundant exporting countries in the emerging markets decreased the competitive powers in European countries that were previously strong in the labor intensive industries.

#### ***4.1.4 Banks practice***

Large-scale lending from banks in the core-EMU countries, combined with excessive borrowing in the periphery countries, made it possible to accumulate unsustainable public and private debt. The integrated European financial market created an implicit promise of banks being saved by the governments, which led to a moral hazard problem in the European financial system (Micossi et al. 2011).

Banks are required to have a 2 to 3 percent equity ratio when lending money. Up until now, banks have not been required to hold any equity capital relative to sovereign bonds in any EMU country causing public debt to be perceived as “risk-free”. The ECB assessed all government bonds under the same conditions and deposit insurance and other regulation made

it beneficial for banks to hold a large amount of government bonds. Therefore, an incentive was created in which both banks and governments could continue their already engrained behavior of lending and borrowing (Boone and Johnson 2012).

The financial crisis was unlikely to have developed with stronger bank regulations. The rise in equity and housing prices in countries experiencing large capital inflows is a contributing factor to banking crises (Reinhart and Rogoff 2009). The financial crisis amplified the effects on the banks from the unsound lending. Declining asset values caused a number of households and firms to be unable to serve their liabilities. In combination with the no longer “risk-free” government bonds, the European banking sector needed to be bailed out (Boone and Johnson 2012). The development in the euro zone after the financial crisis showed that banking risk easily can be converted to sovereign risk due to the banks special role in the economy of providing intermediation to those who cannot access the bond market directly, i.e. households and small to medium sized firms (Holinski et al. 2012).

After the financial crisis, capital did no longer flow to the southern European countries, leaving them without possibility to finance their BOT deficits (Gros 2012). Therefore, the countries now need to restore internal stability to regain investor confidence. The high long-term interest rates represent not only a risk of default but also a self-fulfilling threat that possibly strengthen the likelihood of a default, by pushing the countries into a bad equilibrium (De Grauwe 2011).

It seems that the capital integration contributed to the financial crisis’ severity through its support of excessive private debt in Spain and excessive public debt in Italy and Greece. Without fuelling the asset bubbles in southern countries the financial crisis would not have affected these countries as hard (Gros 2012a).

#### ***4.1.5 Domestic politics***

Different labor policies in each country have, in addition to distorting the geographical mobility, caused different cost and productivity growth resulting in lost competitiveness in the southern countries relative to other member countries. The southern countries inflation rates have not diverged largely from the northern countries; however the inflation differentials in EMU can be significant despite being small (De Grauwe 2009). If unit labor costs increase compared to its competitors, a firm will lose market shares and this will affect economic growth negatively (Felipe and Kumar 2011).

An important difference between the labor force in the euro zone are that northern labor is more skilled and the countries have more efficient machinery and equipment, thus creating

higher labor productivity. Greece, Portugal, Spain and southern Italy are more likely to use low-skilled labor in the production process than the northern parts of Europe (Krugman and Obstfeld 2006). It is therefore clear that the investments into these countries could have greatly enhanced productivity.

#### ***4.1.6 Development of a boom-bust cycle***

Eichengreen (2010) argued that a boom-bust cycle developed in the southern EMU countries due to the convergence of lower long-term interest rates. The countries experienced inflow of foreign capital that increased domestic investments in the short run. This resulted in an economic boom in the construction sector, followed by falling unemployment and rising wages. If the higher capital stock has not increased labor productivity, the country will lose competitiveness, causing slow growth, high unemployment and the need for deflation.

Eichengreen argued that this situation is similar to what has happened in Italy and in Spain, and he predicted that Greece would follow.

#### ***4.1.7 Other institutional issues***

A common feature of the examined southern European countries is the government's lower taxation ability compared to northern European countries, possibly due to a high degree of tax evasion and a less efficient public administration. Transparency International's Corruption Perceptions Index (2011) measures respondents' impression of corruption in the public sector in 182 countries. In 2011, Germany was ranked at number 14; Spain at number 31; Italy at number 69 and Greece ranked at number 80. This shows that there is a credibility problem within the public sectors of the southern countries that needs to be addressed for a more effective tax collection to be created.

### **4.2 The construction of EMU**

EU member countries need to fulfill several economic and legal conditions before an EMU membership is approved. The formal criteria, i.e. the Maastricht convergence criteria, are (European Commission 2012c):

1. The inflation rate must not be more than 1.5 percentage points above the rate of the three best performing EMU member states.
2. The public sector deficit must not be more than 3 percent of GDP.

3. The public debt must not be more than 60 percent of GDP.
4. The long-term interest rate must not be more than 2 percentage points above the rate of the three best performing EMU member states in terms of price stability.
5. Participation in exchange rate mechanism ERM II for at least 2 years without severe tensions, i.e. maintain a stable exchange rate within the ERM without devaluing on its own initiative.

These criteria measure the country's price stability, soundness and sustainability of public finances, durability of convergence and exchange rate stability so that the economy of the specific country is prepared for the common currency and can integrate smoothly into the monetary regime of the euro area without risk of disruption for the entering country or the EMU as a whole (European Commission 2012c).

#### ***4.2.1 The single market***

The *acquis communautaire* means "what has been agreed on in the community" and is the name of the all the common rights and obligations for the EU member states. It contains the accumulated legislation, legal acts, and court decisions which constitute the body of the EU law. Countries wanting to join the EU have to accept and adopt the *acquis communautaire* (Steinberger et al. 2006). It is hard to quantify the extent of harmonization of law and regulation within the EU, however the *acquis* consists of 80 000 items covering 35 policy areas. Estimates of the proportion of national laws based on EU laws vary in the range from 6.3 to 84 percent between the member states (Miller 2010).

The different legal standards and regulatory regimes in the individual countries made large gains possible by aligning rules to facilitate trade across the European borders. The Single European Act (SEA), that was created in 1986 and was operative until 1992, aimed at removing border formalities to speed up the flow of good, to equalize the product standards, to deregulate the transport sector, and to make public procurement in one member state possible to supply from other member states. Another goal of the SEA was to enhance trade in services by extending mutual recognition of professional qualifications. The aim were to lower costs, reduce market segmentation, increase competition and thereby efficiency, and contribute to a reorganization of firms that would lead to economies of scale in the production process. This led to the common European market becoming a single European market with the Treaty of the European Union in 1992, establishing 1 November 1993, as the formal date of formation of the European Union (Venables 2007).



The single market depends heavily on legislation made in the EU-system and can be divided into three types: regulations, directives and decisions (Bulmer 2007). Regulations are applicable in all EU countries, are similar to a national law, and legislate on technical matters. The EU laws set minimum standards, and the national states are free to implement stricter targets. Directives set out general rules to be transferred into national law by each country. National legislation must be changed to implement the directives into national law. A decision only deals with a particular issue and specifically mentioned persons or organizations. Food safety standards, patent laws for intellectual rights, environmental rules and consumer rights are examples of areas that have been harmonized within the EU system.

Competition policy is important to help the single market lead to economic integration by obstructing monopolistic behavior. Article 101 of the Treaty on the Functioning of the European Union (TFEU) forbids collusion and agreements that have the objective to prevent and distort competition. Article 102 of the TFEU forbids abuse of a dominant market position by one or more firms to the degree that it can affect trade. These articles go back to the Treaty of Rome (Martin 2007).

The tax harmonization in the EU applies to the value added tax (VAT), and the minimum rate is 15 percent. This is to hinder distortionary taxation on production as indirect taxes may create an obstacle to the free movement in the single market (Steinberg et al. 2006).

#### ***4.2.2 The ECB and the common monetary policy***

Article 282 of the TFEU states that the main objective of the ECB is to maintain price stability. Ensuring price stability is the most important contribution that monetary policy can make to achieve a favorable economic environment and a high level of employment (ECB 2012a). There is no direct long-run effect on output growth from monetary policy changes but there is an indirect effect on output growth if a low and stable level of inflation is realized, as a predictable inflation rate removes the costs endured by the economic agents created by inflation volatility. The annual rate of inflation best suited to achieve non-inflationary growth is defined by the ECB to be below, but close to 2 percent over the medium term. The ECB measures inflation by the Harmonized Index of Consumer Prices (HICP). Because of the lags in the transmission mechanisms of monetary policy, inflation can only be controlled in the medium-term. The time lag of the transmission mechanisms after changing the key policy rate, assuming a one-to-one effect on the market rates, is 1-3 years.

The central bank's main responsibilities are monetary policy, foreign exchange operations, to promote smooth operation of payment systems, and to hold and manage foreign currency

reserves. In addition to these tasks the bank is responsible for authorization of banknote issuing, collection of statistics, the financial stability supervision, and international and European cooperation. The national central banks (NCB) are responsible for executing the actual monetary policy operations and are thus responsible for providing banks with central bank money. The NCBs assist ECB's foreign currency management as well as their own foreign currency reserves. They share the task of printing euro banknotes with the ECB. The NCB's are also responsible for collecting national statistics and operational oversight of the national financial market (ECB 2012a).

The ECB rests on three legal terms: prohibition of monetary financing, central bank independence and the superiority of price stability. The prohibition of monetary financing means that the ECB cannot purchase public debt instruments directly from governments and cannot provide credit to the public sector. But in principle the ECB can buy unlimited amounts of public and private debt securities in the secondary market, i.e. through the Securities Markets Programme (SMP) (Issing 2008).

The Governing Council manages the ECB. Seventeen out of the 23 council members are the national central bank governors, the remaining six constitute the Executive Board. The Governing Council meets twice each month, deciding the monetary policy on their first meeting, and manage the other responsibilities in the second. The monetary policy decisions are based on an assessment of the economic and monetary developments, the so-called "two pillar strategy" (ECB 2012a). The monetary pillar is an analysis of monetary trends that focus on the long run link between money and prices. The economic pillar focuses on the assessment of current economic and financial developments and possible short to medium-term threats to price stability. Broad ranges of price and cost indicators are used in the evaluation as well as the developments in the exchange rate, the global economy and the balance of payments. These variables should help reveal the nature of shocks and their impact on the real economy (Issing 2008). This is important because the origin of the shocks matters for the conducting of monetary policy. The ECB does not collect country specific information but uses aggregated data for the whole area in its monetary policy decisions. This aggregation of the economic variables allows some countries to be lenient if others are in austerity.

The monetary pillar is strongly related to monetary targeting and attributes a special role to money, as the long run price level is determined by money supply. ECB use the quantity equation in its policy execution,  $\Delta M = \Delta P + \Delta Y - \Delta V$ . The price stability estimated to close but below 2 percent, a GDP trend growth from 2 to 2.5 percent, a velocity of money between

-0.5 and -1 percent per year and this gives a reference value of 4.5 percent for the monetary aggregate M3 (Issing 2008).

Given interest rate parity, the managing of the policy rate by the ECB should not be that different from that of the national central banks, prior to surrendering sovereignty. Still, prior to the forming of EMU, the actual interest rates across the European countries were not equal (Jaumotte and Sodsriwiboon 2010). Artis (2007) used the Taylor rule, consisting of the inflation gap and the output gap, to compute the optimal interest rate for the EMU in 2005. The ECB's policy rate was 2 percent until 5 December that year, while the rate estimated by Artis for the aggregated Euro area was close to 2.5 percent. Country specific estimation by the Taylor-rule suggested that the policy rate should have been close to 6 percent for Greece, close to 5 percent for Spain and close to 3 percent for Italy. De Grauwe (2009) did the same exercise for 2007. His estimations showed that the aggregated output gap for EMU was zero, but within the different countries there were large disparities, e.g. a negative output gap in Italy and a positive in Greece and Spain. He showed that the interest rate should have been 1 percentage point larger in Greece and Spain than the one set by ECB and 1 percentage point lower for Italy. This illustrates that the ECB cannot respond to country-specific shocks amongst the current 17 member states.

A report on EMU by *The Economist* (1998), argued that the European economies might be too diversified for one common interest rate, as there is a risk of the common interest rate being too low for the periphery or too high for the core, or both. If so, the ECB would be a source creating imbalances. This was illustrated by the 1992-93 recession caused by the EMS-crisis where France and Germany pulled out slower than the periphery countries and thus had lower interest rates. A policy interest rate too low for the periphery countries when joining EMU could lead to more borrowing than sustainable. The report stated that this could cause an asset bubble to rise in Spain and Portugal, and that it was already present in Ireland.

The falling demand after the 2008 crisis caused ECB to lower the policy rate to 1 percent during the spring of 2009. The PIIGS-countries experienced they were no longer able to roll over debt at an acceptable interest rate, and the lost ability to issue debt in a national currency for obtaining liquidity became potentially very costly. The turmoil led to the ECB implementing various measures to provide the interbank market with liquidity, and in response to the sovereign debt crisis was the Securities Markets Programme implemented (ECB 2012b). The bank also provided cheap long-term loans to European banks through auctions of three-year money in December 2011 and in February 2012.

### ***4.2.3 Fiscal policy coordination through the SGP***

In response to the lack of theoretical benchmarks in fiscal policy variables discussed in section 4.1.1 the EU created the SGP. The objective of the SGP was to make fiscal discipline a permanent feature of EMU (Buti et al. 2007). It is a rule-based framework for the coordination of national fiscal policies in the EMU to secure sound policies across the members, and does not imply surrendering national tax policies. Sound fiscal policy contributes to a stable macroeconomic environment with low inflation and favorable financing conditions. This promotes investment and long-term growth and reduces the possibility for negative spillover effects. In addition, the countries should be in surplus or balance to act counter-cyclically.

The SGP consists of a preventive and a dissuasive arm. Under the preventive arm the member states must submit annual stability programs called medium-term budgetary objective (MTO), showing how they intend to maintain a budget close to balance or a surplus in the medium term. The European Commission assesses these programs and the ECOFIN Council, consisting of the Economics and Finance Ministers of all EU countries, gives its opinion based on a recommendation from the Commission. The preventive arm includes two policy instruments. First, the European Council can address an early warning to prevent the occurrence of an excessive deficit if the submitted budgets are unsatisfactory. Second, the European Commission can issue policy recommendations. The dissuasive arm contains the excessive deficit procedure (EDP) that is triggered by a deficit larger than 3 percent. The Council gives the violating member state a deadline for correcting the deficit, and if the member state fails to comply, it can be sanctioned. Council decisions are taken by a two-thirds majority of the votes, excluding the vote of the member state concerned (European Commission 2012b).

The domestic parliament can force the national government to abandon the SGP. The government can thus come in conflict between the demands by the EU bodies and the national constitution. Buti et al. (2007) found that the SGP does not per se induce the manipulation of the deficit but is associated with more intense use of accounting manipulation of the deficit. This supports the findings in chapter 2 of the SGP not being successful in promoting sound fiscal policies.

There has been a broad debate on how to reform the SGP after its creation in 1996. Fischer et al. (2006) evaluated 101 reform proposals by academic and non-academic economists two years prior to the dispensation of sanctions on Germany and France by the Council in

November 2003 and to March 2005. They argued that the large number was due to the lack of consensus of fiscal policy's role, but they found that the majority viewed fiscal rules as desirable in EMU to prevent spillover effects from domestic fiscal policies. However, a large disagreement on what policies should be used in the pact was revealed. Beetsma and Giuliodori (2010) criticized the deficit criterion of 3 percent because it does not leave enough room for maneuvering, especially when the monetary policy is surrendered. It can also be counterproductive to impose sanctions in times when the deficit is high if it is due to an unfavorable place in the business cycle. Butier (2006) expressed concern that the handling of the EDP by the EMU financial ministers removes credibility from the sanction implementation possibility, arguing that the sanctions should be implemented by a Supreme Court independent of the national governments.

The 2005 reform of the SGP incorporated the cyclical position of the economy by stating that the deficit increase should only be temporarily and if debt was above 60 percent, it should be maintained at a downward trend (Buti et al. 2007). This revision aimed at making the enforcement more effective (ECOFIN 2005). Prior to the revision there was serious tension between the Council and the Commission as the Commission took the Council for the European Court of Justice because it did not fine France and Germany's lack of attempts to fix their deficits in 2004 (Butier 2006).

A fiscal transfer system has not been suggested in the 2011 revision of the pact. The current EU budget amounts to 1 percent of total EU GDP, and include transfers via the structural and regional funds and in agricultural policy unrelated to the functioning of the monetary union. If the EU should take on the responsibility of providing counter-cyclical revenue and expenditure assistance, an EU-wide budget and a taxation regime is required, transferring political power to the EU institutions (Fuest and Peichl 2012).

### **4.3 The country-specific case study**

A country-specific case study of Greece, Italy and Spain will be conducted with the aim of identifying what has caused the development of internal and external imbalances. To answer the research questions posed in chapter 1, a review will be conducted of the practical problems that have arisen in the EMU, the attempts of the EU to address these issues, in addition to an assessment of the effectiveness of the policy prescriptions suggested to correct the country-specific problems.

The sample countries domestic economic situation was different in the pre-EMU period, but the difference did not decrease sufficiently in the core-EMU period, and this might have contributed to the divergence in the crisis-response period. Whether the domestic imbalances developed as a result of changes in equation (1) or equation (2), specified in section 2.1.1 and 2.2.1, respectively, or if it was other developments that caused the imbalances, will be answered. An examination of the differences displayed in chapter 2 is necessary to evaluate this. The most important findings from chapter 2 will be presented in tables, using the time periods presented in chapter 1.

The analytical set-up for the case study will be: (1) how the economic development has been during the three time period for each country with the aim of identifying the internal and external imbalances; (2) a discussion of how the countries have been affected by the identified imbalances; and (3) a discussion of the effectiveness of the presented solutions in both curing the current problems and to prevent reoccurrence.

#### **4.4 Policy prescriptions to correct for the identified problems**

To correct the imbalances and create economic growth in the short-, medium- and long-term, fiscal stability must be achieved, as well as improved competitiveness and strengthened surveillance of the financial sector. A review of the policies suggested by the major players, i.e. the European Commission, the IMF, the ECB, the OECD as well as academic and non-academic economists is presented in Table 8. To clarify the reasoning behind the measures their effect on the domestic conditions as well as the external will be presented after Table 8.

##### ***4.4.1 Fiscal policy measures***

The bad state of the public finances in the crisis-response period made it necessary to impose fiscal measures aimed at cutting current and future government expenditures. The southern EMU countries need to reform their tax system to collect more revenues by making the tax base larger and the tax collection more efficient (Boone and Johnson 2012). Continued fiscal consolidation has been emphasized by the EU institutions and the IMF to improve fiscal stability and to assist the southern countries in regaining access to the credit market.

Research by Guajardo et al. (2011) on the effect of implemented austerity measures in 17 countries over 30 years found that fiscal consolidation stimulated private domestic demand in the short-term. However, the volume of consumption was reduced and this weakened the economy contradicting the expansionary effect of austerity. Within two years, a 1 percent

**Table 8**  
**Policy measures**

	Imbalance		Timeframe			Aim		Result	
	Internal	External	Short	Medium	Long	Preventive	Corrective	Internal	External
<b>Domestic fiscal policy</b>									
Cut expenditures <sup>a</sup>	X		X	X			X	↓ (G-T), ↓ G	↑ (X-M), ↓ CA deficit
Privatization	X		X	X			X	↓ G, ↑ T	↑ (X-M), ↓ CA deficit
Tax reform <sup>b</sup>	X		X	X			X	↑ T	↑ (X-M), ↓ CA deficit
Increase VAT	X		X	X			X	↑ T	↑ (X-M), ↓ CA deficit
<b>EMU-wide fiscal policy</b>									
SGP reform	X	X		X	X	X	X	↓ (G-T)/GDP, ↓ debt/GDP	↓ risk of negative spillovers
Fiscal compact	X	X		X	X	X		↓ (G-T), ↓ G, ↑ T	↓ risk of negative spillovers
Declining long-term debt ratio	X	X		X	X	X	X	↓ debt/GDP	↓ risk of negative spillovers
Excessive deficit procedure	X	X		X	X		X	↓ (G-T)/GDP	↓ (X-M) deficit, ↓ CA deficit
Excessive imbalance procedure		X		X	X		X	↓ (G-T)/GDP, ↓ debt/GDP	↓ (X-M) deficit, ↓ CA deficit
Planned scoreboard		X		X	X	X		↓ (G-T)/GDP, ↓ debt/GDP	↓ (X-M) deficit, ↓ CA deficit
<b>Structural reform</b>									
Labor market efficiency <sup>c</sup>	X	X		X			X	↑ employment	↓ unit labor costs
Harmonizing benefit system <sup>d</sup>	X	X		X		X	X	↓ unemployment	↑ labor mobility
Harmonizing labor regulation <sup>e</sup>	X	X		X		X	X	↓ unemployment	↑ labor mobility
Service procurement	X			X			X	↑ competition	↑ X
Euro Plus Pact	X	X		X			X	↑ competitiveness	↑ X, ↓ inflation
Technological progress and innovation	X	X			X		X	↑ GDP	↑ (X-M), ↓ CA deficit
<b>EMU-wide financial stability</b>									
Higher equity ratio on gov. bonds	X	X		X	X	X		Eliminate moral hazard	
Common regulatory framework <sup>f</sup>	X	X		X	X	X	X	Saving banks	
EFSF & ESM		X	X	X	X		X	Crisis resolution	
Eurobond		X	X	X	X	X	X	Regained access to external financing	

a: Including measures such as reducing the number of public employees, freezing or cutting public wages, increase pension ages and reducing the extension of publicly produced services. b: Including raising the tax base and making tax evasion less widespread. c: Including increasing wage and contract flexibility. d: Including lower duration and size of unemployment benefits, also allow it to be less dependent on having established a residency. e: Including mutual recognition of professional qualifications and subsidized moving. f: Including common framework for bank resolution, crisis resolution and more centralized supervision.

of GDP in fiscal consolidation reduced real private consumption by 0.75 percent, while real GDP declined by 0.62 percent. The decline was softened by an increase in net exports associated with a depreciation of the domestic currency, but this offsetting channel was lower in economies with pegged exchange rates. Fiscal consolidations in economies with a high perceived sovereign default risk was also found to be contractionary. On this basis it may be inferred that austerity cannot be imposed without hampering growth. However, decreased public and private internal demand leaves a larger share of domestic production available for the export market. Holinski et al. (2012) argued that current accounts improve in countries with contractionary fiscal policies, and that past and current fiscal policy influence the current account both directly and indirectly through its impact on private savings and investment decisions.

The failure to comply with the SGP suggests a quicker and more automatic surveillance procedure than the EDP. A reinforced SGP, the so-called “Six-Pack” that entered into force on 13 December 2011, contains new rules for economic and fiscal surveillance as well as stronger sanction possibilities under the dissuasive arm. The decision-making process is changed to a reverse qualified majority voting, described as a semi-automatic decision-making procedure, intended to make it difficult for some EMU member states to form a blocking majority. In addition, the new pact enhances the enforcement of the debt criterion by requiring member countries with excessive debt to reduce the gap between their debt and the reference value by 1/20th annually. A new surveillance mechanism, called Macroeconomic Imbalance Procedure (MIP), has also been implemented. The MIP aims at preventing and correcting imbalances within the EU by an Excessive Imbalance Procedure (EIP) where the Council and Commission can sanction member countries that do not comply with its recommendations in the event of excessive macroeconomic imbalances. Under this procedure a macroeconomic scoreboard to provide an early warning system will be created for each member country (European Commission 2011).

The Treaty on Stability, Coordination and Governance (TSCG), which is to be implemented on 1 January 2013, aims at achieving stronger fiscal coordination in the euro area. The TSCG includes a fiscal compact committing member states’ budget deficits to be no more than 0.5 percent of GDP. If a member state fails to comply with the compact, it will be brought before the European Court of Justice. The Treaty also established coordination of economic policies to enhance convergence and competitiveness. The treaty makes access to the crisis fund, ESM, dependent on having implemented the stated additions to national law (Gros 2012b).



#### ***4.4.2 Structural reform in the labor and product markets***

The individual countries can no longer use  $E$  to regain competitiveness, but a devaluation of the euro where the ECB runs an expansionary monetary policy would allow the southern countries competitiveness vis-à-vis the outside countries to improve. However, devaluation of the nominal exchange rate to boost exports increase inflation resulting from more expensive imports that decrease real wages and thus the living standard as well as savings. In addition, after devaluating the euro, the southern countries will still have higher unit labor costs relative to Germany and other EMU countries. This means the countries still need to go through fiscal consolidation and internal wage and price cuts to regain competitiveness vis-à-vis the other EMU members (Boone and Johnson 2012).

In the EMU, country-specific reforms reduce mark-ups in the labor and service market and leads to increased output and welfare by enhanced competition. Reform in just one country will produce positive domestic effects but cross-country coordination of reforms produce larger positive effects, as each country benefits from the economic activity expansion in the partners economy, leading to a more uniform macroeconomic performance in both the short- and long-term (Gomes et al. 2011). Private restructuring and public structural reforms will have a significant impact on intra-EMU competitiveness, implying that these measures are the best approach to preserve long-term economic stability in Europe. More flexible labor markets and more incentive-compatible welfare states are given as solutions for the necessary re-balancing (Zemanek et al. 2009). Temporary shocks should be mitigated through wage flexibility, while permanent shocks require re-training policies and higher geographic mobility. Achieving this entails changing the current bargaining structure of wages and decreasing employment protection legislation (Janiak and Wasmer 2008). An IMF country report (2011a) indicated areas to impose structural reforms by demonstrating the structural reform gaps in several European economies. Medium term reforms included labor market inefficiency and regulation of businesses, networks, the retail sector and professional services. The long term reforms included institutions and contracts, human capital, infrastructure, and innovation. The results showed the largest structural reform gap for Greece, followed by Italy and then Spain. Given this evidence, it can be seen that the southern countries must facilitate internal devaluation by implementation of structural reforms in the labor and product market. Allowing this requires an inflation rate below other EMU members, and below the ECB target. The southern countries will thus need to keep the inflation rate close to 1 percent. The structural rigidities in the labor market have been suggested addressed through the Euro Plus

Pact, through greater harmonization of policies and national laws.

Given the important role labor mobility has in mitigating asymmetric shock, a more uniform legislation might decrease the high level of unemployment. Tax, benefit and pensions systems should not discourage labor participation. In addition, the remaining regulatory and market-based barriers to entry in selected professions must be removed. And the single market needs to be advanced, especially in the area of services where these countries are already net exporters, and need to enhance their comparative advantage (Trichet 2011).

In the medium run it is crucial to improve productivity growth in both the tradable and the non-tradable sector. Technological progress and innovation that lowers the need for inputs per unit of produced output, and increased availability of the production factors, are the main sources of economic growth. The effect on international trade from a higher growth rate will depend on the income elasticity of demand for imports, i.e. the net result from the production and consumption effects (Appleyard et al. 2008). Productivity growth depends on capital investment, education, innovation, product market regulation, labor market flexibility, and the business environment (Jaumotte and Sodsriwiboon 2010). Improvements in productivity is necessary to rebalance the diverging current account positions (Christodoulakis 2009).

Section 2.3 demonstrated that the southern countries had declining labor productivity despite large capital inflows, indicating that the countries have not centered the investments towards productivity growth and capital-intensive industries. EIB (European Investment Bank) could provide liquidity to small and medium sized firms, as the banks are tightening their credit.

#### ***4.4.3 Financial regulation***

Spain complied with the SGP throughout the core-EMU period, suggesting that other measures than the fiscal compact needs to be implemented. Section 4.1.4 demonstrated the presence of an incentive to run a risky lending practice by banks and a frivolous borrowing practice by governments. The market now punishes states with excessive debt and deficit but this mechanism did not work during the core-EMU period, as the spreads converged, while the risk did not. The reason for the failure of the financial market to diversify risk was an expectation that the governments would intervene in case of solvency problems in an EMU member country (Fuest and Peichl 2012). Long-term EMU success will thus depend on implementing institutions that limit the impact of moral hazard both in banks and in national government budgets.

Dewatripont and Freixas (2012) argued that the Basel II regulatory framework for banks failed, as the banks did not have enough capital once the financial crisis unraveled. They stated that the Basel III regulation is aimed at building counter-cyclical capital buffers in good times with the objective to limit the extent of credit crises that are generated by excessive credit supply. National supervisors can be pressured to pursue national objectives, making a fully centralized European bank supervisor desirable. They thus argued that a common supranational authority should function as a European deposit insurer, as well as provide a common crisis management and bank resolution framework. Mayer et al. (2012) proposed similar changes to the financial regulation and supervision, with EMU-wide deposit insurance and a bank resolution scheme. The reason they gave was that banks need to operate on an aggregated euro-wide level to better diversify country-specific credit and funding risk, and these changes will enhance this financial integration.

There is no certain way to curb a bank crisis started by excessive debt as this makes the economy vulnerable for a confidence crisis. The dynamics of such a crisis is that banks need to be saved by the government, and then the government will be saved by the banks, followed by both needing to be saved by the central bank. This causes a lengthy and severe contraction of economic activity, as the economic agents need to deleverage, and confidence needs to be restored. The average length of a banking crisis after World War II has been 4.4 years (Reinhart and Rogoff 2009).

The southern countries experienced a rapid growth in private sector credit, with an accumulation of risky financial assets. The banks failed at carrying the losses from the risk they had taken, and the market value accounting in Basel II has pro-cyclical characteristics that hurt the bank's asset side of the balance sheet, amplifying the crisis (Trichet 2011). Central banks can limit the growth in private credit and the accumulation of loans with a low quality ratio by financial supervision, making credit providing stricter during economic prosperity (Jaumotte and Sodsriwiboon 2010). Trichet (2011) stated that it is necessary to restructure and strengthen the balance sheets of firms, households and governments to get the growth rate back. However, it will not be possible to enhance investments or consumption unless firms and households get access to credit. The ECB's LTRO program has improved European banks' liquidity situation, but it remains to be seen whether the banking sector in the southern countries will need emergency assistance.

#### ***4.4.4 Crisis resolution mechanisms and exit***

The European Stability Mechanism (ESM), that is to be implemented on 1 July 2013, is a permanent institution with €500 billion in lending capacity from a capital base of €80 billion. The ESM will serve as a crisis-resolution mechanism, covering for the lack of procedure in case of government default or exit from the EMU. If a country faces serious financial difficulties and loses access to private capital markets, it may apply for support from the ESM. The aim of the fund is to avoid sovereign debt restructuring in the case where a country is fundamentally solvent but face a liquidity crisis and to allow for debt restructuring if a country is insolvent. If a country fails to service the debt, the losses are distributed among the other member states according to their capital shares in the ESM (Fuest and Peichl 2012).

Discontent with the current political system could increase incentives for the southern countries to leave the euro collaboration for trying to export their way back to full employment by a rapid real depreciation of the exchange rate. However, it is not certain that the economic problems be significantly improved by leaving. Eichengreen (2010) emphasized that the immediate economic benefits may be much smaller than the long-run economic and political costs, as an exit is expected to raise government bond spreads and thus the debt-serving costs. The size of these costs will depend on why the country leaves as well as the credibility of the national central bank and the other national institutions. These costs could be eliminated if fiscal reforms are adapted at the same time as the exchange rate is re-introduced and depreciated. However, there exist technical difficulties concerning the reintroduction of national currencies. During the process of creating new national money, euro-denominated asset holders will have time to leave the country in expectation of a devaluation. This will hurry a banking and financial collapse, and Eichengreen argued that an exit is only possible in combination with imposing capital controls. The political costs are unknown, as no guideline of either an orderly or disorderly exit from the EMU is present in the current EU legislation. He concluded that it is unlikely that one or more EMU member will leave the union in the next ten years. However, Boone and Johnson (2012) described how easily a country could be cut off from the EMU system, as all that is needed is to cut the national central bank off from the current payment system and prevent the country from issuing new euros. They argued that allowing one country to leave would be too risky as this would be a recognition of the possibility to leave, and would put pressure on the obvious candidates to do so. Capital would flee these countries, possibly leading to a currency crisis for the euro, putting some of the major banks at risk and thus the credibility of some of the core EMU states.

A Eurobond is a joint guarantee for government debt in the EMU. The suggested Eurobonds would be jointly backed by all governments in the EMU causing the creditworthiness of the countries to converge. A system of common government bonds in the EMU would allow the southern states to take advantage of the better credit ranking of northern members and regain access to market based financing. An objection to the Eurobond proposal is that it serves to undercut the creditworthiness of the stronger members, rather than strengthen that of the weaker. It may also be politically unfeasible, as it is German creditworthiness all countries would draw upon. To create red and blue Eurobonds where the issuer of red will face a higher risk premium has been suggested. This is intended to create an incentive for states to behave more responsible until they can pay lower interests if approved for the blue bonds. European Commission suggested Eurobonds (De Grauwe and Moesen 2009).

Zemanek et al. (2009) argued that an engagement by the ECB in quantitative easing, buying government bonds, or to create Eurobonds would eliminate the incentives for structural reforms in the countries facing market finance difficulties. Mayer et al. (2012) stated that it is necessary for the long-term survival of EMU that the national governments take full responsibility for their finances. They stated that this will require default in case of a failure to comply with the SGP.

The dis-equilibriums identified in this section show that the incomplete labor market harmonization caused divergence in competitiveness from unequal cost developments, making the scope for further harmonization to enhance flexibility large. It also identified a failure of the fiscal policy framework to provide the intended discipline. Whether this happened because the countries joined the EMU will be examined in chapter 5.

Issing (2008) stated that from the perspective of economic theory, the start of the European Monetary Union marked the beginning of an experiment of truly historic dimensions. The common compliance to the Maastricht-criteria have reduced the previously high inflation rates and removed the possibility of trade wars as well as frequent devaluation. Competition has increased, so has intra-EU trade. But the long-run survival of the EMU depends on more than its overall convergence, as the current imbalances serves to illustrate. There has developed problems in the EMU that the criteria for an optimal currency area do not address and that the given stabilizing mechanisms were unable to eliminate, in part because they have not been flexible enough. To correct for the internal and external imbalances several suggestions of policy changes and new measures have been put forward. In the following chapter a country-specific diagnosis of the three southern countries will be performed to

identify both what caused the imbalances, and an evaluation of whether the proposed measures will provide sufficient insurance against reoccurrence of the identified problems.

## **5. Case study**

To answer the research questions posed in chapter 1, a case study of the three EMU member states - Greece, Italy and Spain - will be conducted. The domestic macroeconomic situation, policy differences and microeconomic variables will be compared by using data from the period between 1992 and 2011. Each country will be investigated to understand whether the imbalances were: (a) the result of purely domestic sources; (b) the result of domestic difficulties amplified by EMU membership; or (c) the result of these countries joining the EMU, regardless of their domestic state of affairs prior to membership. This should enable answering whether the overall EMU is destined to fail, as it will point toward whether the EMU membership caused the imbalances in the core-EMU period.

The case-study provides a country-by-country deduction to identify internal and external problems, followed by an evaluation of the suggested measures from the EU. Tables will highlight the roots of the internal and external imbalances in the three member states. Finally, a conclusion of whether the suggested measures to the identified problems will correct the imbalances and thus provide a stable future for the EMU will be reached.

The analytical set-up for the case study will be: (1) how the economic development has been during the three time period for each country with the aim of identifying the internal and external imbalances; (2) a discussion of how the countries have been affected by the identified imbalances; and (3) a discussion of the effectiveness of the presented solutions in both curing the current problems and to prevent reoccurrence. The tables will present an initial position corresponding to the pre-EMU period, and the development relative to core-EMU period will be displayed in the next column. Then the development in the crisis-response period is displayed in the final column.

### **5.1 Country specific results**

#### ***5.1.1 Greece: Consumption-led growth***

Table 9 describes the initial domestic macroeconomic situation in Greece as one with catching-up potential as the country has low GDP per capita and low consumption relative to Italy and Spain. This is supported by the initial high growth rate that continued in the core-EMU period. Greek GDP and consumption was thus expected to converge towards the richer EMU countries and capital was expected to flow into the country. Section 2.1.1 confirms the expected convergence. However, the decomposition of the investment structure reveals that

**Table 9**  
**Economic development in Greece (1992-2011)**

	1992-1998	1999-2007	2008-2011
<b>Internal macroeconomic situation</b>			
GDP per capita <i>current prices, billion euro</i>	8 222	15 654	20 660
GDP <i>growth rate</i>	1,8	4,2	-2,7
Consumption per person <i>current prices, billion euro</i>	n.a.	14 225	18 550
Investment <i>percent of GDP</i>	19	22	16
Government revenue <i>current prices, billion euro</i>	32	69	90
Government expenditure <i>current prices, billion euro</i>	38	78	116
<b>External macroeconomic situation</b>			
Gross savings <i>percent of GDP</i>	17	14	5
Household saving rate <i>percent of disposable income</i>	n.a.	n.a.	n.a.
Investment <i>percent of GDP</i>	19	22	16
Government structural balance <i>percent of potential GDP</i>	-7,5	-5,8	-12,6
Government debt <i>percent of GDP</i>	96	102	137
Volume of export of goods <i>growth rate</i>	3,2	6,5	-0,2
Volume of import of goods <i>growth rate</i>	5,2	4,0	-8,6
Intra-EU BOT	Deficit	Deficit	Deficit
Current account balance <i>percent of GDP</i>	-2,1	-8,0	-11,1
<b>Macroeconomic indicators</b>			
Inflation <i>average growth rate</i>	9,7	3,2	3,3
Real exchange rate <i>Index 1999=100</i>	97	101	111
Unit labor costs <i>Index 2005=100</i>	n.a.	94	113
Labor productivity <i>Index EU-27=100</i>	n.a.	79	80
Unemployment rate	10	10	12
10Y Government bond yields	16	5	9
<b>Microeconomic situation</b>			
Household debt-to-income ratio	n.a.	n.a.	n.a.
Firm debt-to-income ratio	n.a.	n.a.	n.a.
Private credit flow <i>percent of GDP</i>	4,4	11,6	6,2

Greece had the highest share of government fixed investments in the core-EMU period of the countries, but the lowest share of business investments. This evidence points to a domestic distortion in Greece that contributed to an unfavorable situation for the private sector relative to the public sector.



The external macroeconomic situation in Table 9 displays that the saving rate was lower than investments initially, and this trend continued in the core-EMU period. Combined with negative public savings, this means the country has been dependent on capital inflows. The increased current account deficit in the core-EMU period and the decomposition of the current account in section 2.2.3 confirms this is the case. The initial domestic macroeconomic situation was thus one with pro-cyclical fiscal policy, and this continued in the core-EMU period.

The high growth in private credit as well as in merchandise and service imports in the core-EMU period indicates that both private and public consumption increased more than national income, creating an external imbalance. In addition, the large increase in private credit in the core-EMU period suggests that the enhanced financial market integration after the EMU membership contributed to easier access to credit.

The macroeconomic indicators reveal the highest unit labor cost growth and this contributed to a higher inflation rate than the EMU-average. The increased unemployment in the core-EMU period indicates both a loss of competitiveness following from higher cost development but also an inefficient labor market. The real exchange rate appreciated less than Italy and Spain's. The low labor productivity in the core-EMU period indicates that investments were not allocated to accumulate capital. The low labor productivity suggests that the government lending were not channeled to productive investments.

The most important internal imbalance identified is thus economic growth without an effect on the real economy as unemployment increased and labor productivity remained low. This suggests that a consumption-led boom took place in the core-EMU period without managing to increase real production capacity to be able to repay the foreign creditors. This seems to have been made possible because of the EMU membership, as the BOT, and accordingly the current account, deteriorated significantly during the core-EMU period. It was thus the large inflow of foreign capital that allowed the consumption growth and led to an external imbalance.

In summary, three sources of imbalances have been identified: First, the pro-cyclical fiscal policy with excessive deficit and debt expansion; second, the external financing of the deficit placing the country in an unsustainable position with a current account deficit; third, the country lost competitiveness due to a higher inflation rate and cost growth. This allows a discussion of the implications of these imbalances in the following section.

The stability of the debt-to-GDP ratio around 100 percent, combined with the highest average GDP growth of the sample countries, indicates that the country did not prioritize debt

reduction in the core-EMU period. The country's liabilities were manageable during the above mentioned periods due to the high growth rate but the country was vulnerable to changes in the business cycle. Greece's GDP contracted each year since 2006 and the country could no longer refinance its debt when the global recession hit, leading to de facto insolvency. The pro-cyclical fiscal policy, allowed by the perceived elimination of a risk premium on government bonds, was thus amplified by the EMU membership. That the country was able to issue government bonds at the same low interest rate as Germany suggests that the EMU membership contributed to more fiscal profligacy in Greece.

However, the negative BOT and current account when Greece entered EMU in 2001 reveal that the imbalances were already present. The country financed its deficits through foreign capital inflow, as the position the financial account displays an increasing surplus in the core-EMU period. This is confirmed by Jaumotte and Sodsriwiboon (2010) decomposition of Greece's current account. They provided evidence that the deficit were financed in large parts with portfolio investments and not FDI. Rather than investment in capital intensive industries the capital inflows represent financial institutions borrowing, not allowing the countries to increase future income by more export to pay the foreign debt.

The consequence of the high current account deficit when the capital has not been used to generate efficient investments is, according to the discussion in section 4.1.3, a lending crisis if foreigners stop being willing invest in the country. Intra-EU inward direct investments in Greece decreased in from core period to the crisis-response period by 49 percent, placing Greece in a risky position, as it is dependent on foreign capital inflow to fund its current account deficit. The Greek banking sector was severely affected after the financial crisis, with an exposure to both Greek government bond as well as excessive private debt. This suggests that it was more than the failure to comply with the SGP that took place in Greece. The debt-to-income ratio data is not available for Greece, removing the possibility of seeing how the private debt-to-income ratio evolved in the core-EMU period.

A capital flight from Greek banks can be seen in the declining saving rate in the crisis-response period and by the large increase in direct investments abroad in the crisis-response period relative to the core-EMU period. This contributes to increase the already fragile banking sector.

Greece has not been able to increase its share of exports to the other EU countries since 1999, and this share is very low relative to the Italy and Spain's, implying that the country has been unable to integrate further with the other EMU members. This gives the impression that Greece should not have been a part of the monetary union in the first place. However, more

than 60 percent of its merchandise exports went to the EU in 2010, while it imported 50 percent back (WTO 2011). This means the country is economically integrated with the EU, but is not a large trade nation. Despite the high share of Greece's intra-trade volumes, the low percentage share of Greece's intra-EU export and import suggest that Greece had more to gain from joining the EMU than the other members could gain from Greece joining. This is a possible source of moral hazard, particularly when it comes to the excessive public borrowing. In retrospect, the underreported information of the debt and deficit to the EU institutions make it seem as Greece did not intend to comply with the SGP and should thus not have been admitted into the collaboration.

Greece lost close to 30 percent of its previous market share for export of goods and services relative to the imports of 35 industrial countries from 2000 (European Commission 2012b). The inability to increase its share of exports to the other EU countries could also indicate that the country did not lose competitiveness relative to its EU trading partners during the core-EMU period, but instead lost competitiveness to cheaper nations such as Eastern Europe and emerging markets in Asia and Latin-America.

Greece did not view the EMU membership as an opportunity for reform (Tsoukalis 2012). Monthly minimum wages in Greece was 15 percent higher than those in Spain, and Greece had the lowest average tax rate. Greece has one of the highest numbers of self-employed in the EU and many of these businesses do not pay taxes (Tsoukalis 2012). If Greece had the tax collection capacity of the average performing OECD member country, tax revenues would increase by close to 5 percent of GDP (OECD 2011). Both the average effective retirement age for men and women have been declining over the three sample periods.

The review of the consequences of the identified imbalances suggests that Greece falls into category (b) where it was domestic sources such as excessive government expenditures and unwillingness to reform that led to a deficit position on the current account and lost competitiveness, but that the domestic imbalances were amplified by the EMU membership, due to the converged long-term interest rates that provided easier access to credit.

This access has been fatal for the country as it is insolvent and dependent on emergency assistance from the EU and the IMF. The total amount of assistance to Greece, including the money from 2010, amounts to €73 billion. €9.1 billion went to the Greek government, €48 billion to recapitalization of Greek banks and €5.5 billion to be paid to those lenders that have surrendered parts of the Greek public debt. Greece is obliged to reduce their debt to 116 percent, 120.5 of GDP by 2020. These measures have not been sufficient in the way that the

financial markets have not yet allowed Greece re-entry. But they have hindered an actual default.

The interest rates paid on the loans granted by the IMF and the EU are close to 6 percent. Micossi et al. (2011) argued the effective cost of the loans is too high relative to Greece's nominal growth rate, as this will cause the debt-to-GDP ratio to expand further over the years even with primary surpluses. It is therefore essential to create new jobs in Greece.

In an IMF report on the current Greek situation (2012a) the measures of the reform package is elaborated on. The package aims at stabilizing the fiscal expenditures, and to impose structural reforms and many of the measures has already been implemented. Government revenue is to be increased by raising VAT and excise taxes, and strengthening the tax collection capacity as well as the tax base. Government expenditures are to be reduced by cutting the level of benefits in the social security system and removing the special privileges for public employees. A pension reform, including limiting provisions for early retirement, is proposed. Significant cut in military spending is suggested. Structural policies in the government aim to modernize the public administration. The labor market is to be strengthened; the business environment improved; and state enterprises are to be privatized. To enhance competitiveness services will be liberalized, minimum wages reduced, collective bargaining made more effective and nonwage labor costs lowered. The Greek labor market reforms from 2011 are expected to reduce costs by 15 percent over the coming 3 years (European Commission 2012b). Greece has created a Reform Ministry which will be responsible for cutting 150 000 public sector jobs by 2015. Greece implemented a pension reform in 2010 and a progressive tax reform in 2011.

In the crisis-response period, Greece has reduced the fiscal deficit, the BOT and current account significantly from 2009, but the debt is approaching 170 percent of GDP. The high debt suggests that Greece has no choice except continuing the consolidation measures. The inflation rate has declined, and so has the real exchange rate. However, the labor costs have not declined much yet, indicating that the flexibility of wages and labor markets has not increased enough. Labor productivity is well still below the EMU average, suggesting a large potential for structural reforms to increase efficiency. This suggests that the internal adjustment process is moving too slowly to create room for export-led growth. The political and social turmoil in the crisis-response period demonstrate that the political climate is not enough committed to reform, and indicates that the IMF should have demanded reforms prior to providing liquidity.

It is also a question whether Greece is in a position where it can export its way out of the problems. The Greek industry's share of GDP amounts to about 14 percent, which is the lowest share in the sample. The country does not have a very large merchandise export sector, as is was ranked by WTO (2011) as number 66 in world exports and number 41 in imports, based on the value of the traded volume. However, it was ranked as number 26 in world commercial service exports and number 38 in imports. These services are mainly shipping and tourism (WTO 2011). The composition of the Greek GDP shows an 80 percent contribution by services, suggesting a potential for export-led growth in this sector. The country need to provide a more stable domestic climate to allow for more tourism.

In conclusion, whether the already implemented and suggested policy measures will stabilize the situation will depend on the Greek populations' willingness to accept the reform demands outlined by the EU institutions and the IMF. The worst case scenario of a default and an exit from the euro collaboration will destabilize the domestic political and economic climate further. Greece will need to renegotiate all current agreements with the EU, and the country must implement a new monetary policy regime including the decision of the interest rate level, whether to use inflation targeting and chose an exchange rate regime. It will not be possible to change the whole country's physical payment system from euros to drachmas rapid enough to hinder massive withdrawals from Greek banks. The bank runs will cause the banking sector to collapse. The depreciation of the drachma will cause Greek inhabitants to lose much of their asset value, and firms that have their debt in foreign euros and income in drachmas will face bankruptcy. All this will contribute to lower demand, lower output, and higher unemployment, which could lead to mass emigration from Greece. In the end the country will have to go through the same expenditure cuts after an exit as the current austerity program demand. This indicates that the country has more to gain from remaining in the EMU than from leaving.

The fact that Greece led a pro-cyclical fiscal policy, as well as underreported their true deficit and debt, indicates that a stronger surveillance mechanism in the SGP and a stricter deficit target is necessary. Also, the macroeconomic surveillance mechanism will be important to hinder large BOT and current account deficits. The structural reforms and fiscal consolidation are necessary measures and needs to continue. However, as Greece took part in a global credit expansion, the most important policy measures will be better surveillance and regulation of financial institutions, addressing the moral hazard incentives on both the lending and the borrowing side.

### ***5.1.3 Italy: Declining productivity growth***

Italy is the largest economy of the three sample countries but still has catching-up potential compared to the northern European states. Its nominal GDP per capita converged to the German level in the core-EMU period. Table 10 displays a low average growth rate in Italy during the core-EMU period, and this rate was the lowest of the sample countries. The country experienced a recession after the financial crisis. Italian government expenditures were larger than its revenue in all periods. Total investments increased the least in the core-EMU period relative to Greece and Spain. However, it has remained at the same level in the crisis-response period. These results point toward Italy not having experienced an economic boom in the core-EMU period.

Gross savings was larger than investments in the pre-EMU period, this reversed in the core-EMU period, as the household saving rate declined. Total savings declined further in the crisis-response period. Both government and private investment levels increased slightly in the core-EMU period. Intra-EU inward investments in Italy have declined by 77 percent, on average, in the crisis-response period.

The structural government balance in Table 10 demonstrates that Italy violated the deficit criterion of the SGP during the core-EMU period, and was never in compliance with the debt criterion. This indicates a pro-cyclical fiscal policy. However, figure 2.5 and 2.6 displayed that the debt and deficit, as a percentage of GDP, was on a downward trend in the core-EMU period.

The intra-EU BOT was positive in the pre-EMU period, remained close to balance in the core-EMU period and went into the positive in the crisis-response period. The growth rate of the volume of imports was higher than the growth rate of the volume of exports in the core-EMU period. This could have contributed to the decline in intra-EU BOT during the core-EMU period. Italy had a positive current account from 1993 to 1999, which turned negative after joining EMU.

The macroeconomic indicators in Table 10 identify a large decline in the labor productivity. Italian unit labor costs grew at a lower rate than Greece and Spain and inflation was below Greek and Spanish and converged towards the German rate in the core-EMU period. But the real effective exchange rate appreciated and remained close to the Spanish throughout the core-EMU period. That the country has the lowest unemployment rate of the southern countries combined with the slowest economic growth, indicates that the labor force has been mobile or that the government has spent excessive resources on different policy

**Table 10**  
**Economic development in Italy (1992-2011)**

	1992-1998	1999-2007	2008-2011
<b>Internal macroeconomic situation</b>			
GDP per capita <i>current prices, billion euro</i>	16 596	23 177	25 873
GDP <i>growth rate</i>	1,3	1,5	-1,2
Consumption per person <i>current prices, billion euro</i>	13 114	18 211	20 925
Total investment <i>percent of GDP</i>	20	21	20
Government revenue <i>current prices, billion euro</i>	432	603	718
Government expenditure <i>current prices, billion euro</i>	496	641	782
<b>External macroeconomic situation</b>			
Gross savings	21	20	17
Household saving rate <i>percent of disposable income</i>	20	16	14
Total investment <i>percent of GDP</i>	20	21	20
Government structural balance <i>percent of potential GDP</i>	-6,7	-3,7	-3,1
Government debt <i>percent of GDP</i>	117	107	116
Volume of export of goods <i>growth rate</i>	2,1	5,5	-1,0
Volume of import of goods <i>growth rate</i>	0,6	6,5	0,9
Intra-EU BOT	Surplus	Balance	Surplus
Current account balance <i>percent of GDP</i>	1,4	-1,1	-2,9
<b>Macroeconomic indicators</b>			
Inflation <i>average growth rate</i>	3,8	2,3	2,1
Real exchange rate <i>Index 1999=100</i>	101	105	116
Unit labor costs <i>Index 2005=100</i>	82	95	112
Labor productivity <i>Index EU-27=100</i>	121	109	104
Unemployment rate	11	8	8
10Y Government bond yields	9	5	5
<b>Microeconomic situation</b>			
Household debt-to-income ratio	n.a.	42	62
Firm debt-to-income ratio	n.a.	384	673
Private credit flow <i>percent of GDP</i>	3,5	8,4	4,2

measures. The long term interest rates declined in the core-EMU relative to the pre-EMU period, and have allowed cheaper public borrowing.

The microeconomic variables in Table 10 show that household and firm debt-to-income ratio increased in the crisis-response period, consistent with a drop in asset values after the crisis. Declining asset values decrease household and firm wealth, and can increase defaults

and bankruptcies, affecting the solvency of the bank sector if a sufficiently large number of households and firms fail to serve their debt. The debt-to-income ratio for non-financial corporation increased by 93 percent from the core-EMU period to the crisis-response period, while the corresponding number for households was 47 percent. The annual credit flow, as a percentage of GDP, doubled in the core-EMU period. This illustrates that the decline in income after the financial crisis lowered the Italian households and corporations' debt serving ability, enhancing the number of losses incurred by the Italian banking sector on loans issued to these firms.

The most important internal imbalances identified are slow economic growth. The declining labor productivity has possibly contributed to this and indicates that investments have not been allocated efficiently. If this is the case, the necessary capital accumulation to maintain productivity has not occurred. In addition, Italy has led a pro-cyclical fiscal policy, violating the fiscal framework of the EMU. The current account changed from a surplus in the pre-EMU period to a deficit in the core-EMU period, due to declining private savings combined with negative public savings, causing an external imbalance.

The Italian situation thus resembles the Greek in having become dependent on external financing of the fiscal deficit, placing the country in both a risky and unsustainable position with a current account deficit. The Italian current account deficit is larger than the Greek, but Italy is a larger economy. Also, Italy has not lost as much competitiveness as Greece, possibly due to a both lower unit labor cost growth and a lower inflation rate. In summary, the most important imbalances identified in Italy are: The slow growth, the declining labor productivity and the dependence on external financing of the government expenditures. A discussion of the implications of these imbalances follows.

The downward trend of the debt-to-GDP ratio, combined with the lowest average GDP growth of the sample countries, indicates that Italy prioritized debt reduction in the core-EMU period. The country also decreased its fiscal deficit in the second half of the core-EMU period. However, the country is dependent on accessing the financial market to refinance debt, and this made Italy vulnerable to changes in the business cycle.

The decomposition of the Italian current account in section 2.2.3 revealed that the country financed their fiscal deficits in the core-EMU through foreign capital inflow as they have negative net factor income and negative net cash transfers, combined with surplus on the financial account. The continued pro-cyclical policy in the core-EMU period indicates that Italy took advantage the cheaper borrowing conditions from the lower long-term interest rates



it faced during the core-EMU period relative to the pre-EMU period. This entails that Italy's EMU membership directly contributed to the excessive public lending.

Intra-EU inward direct investments decreased from the core period to the crisis-response period by 77 percent, placing Italy in a risky position, as it is dependent on foreign capital inflow to fund its current account deficit.

Italy's share of intra-EU exports declined in the core-EMU period, indicating loss of competitiveness relative to its EU trading partners. The surplus on the intra-EU trade balance in the crisis-response period shows that the country has potential for increasing trade with the EU. However, Italy's improved intra-EU BOT could be due to the lower import demand displayed in Table 10.

Simonazzi and Vianello (1998) stated that a special feature of the Italian economy was that the northeastern regional network of industries were largely made up of small-medium sized family firms, and they argued that the small size of the firms would make it hard to take advantage of the economies of scale triggered by the single market. Also, the eastern EU enlargement would bring in low-cost competitors to the Italian industry where they have a comparative advantage. These predictions seem to have come true as Italy has lost competitive power relative to other member countries since it joined the EMU, and this has contributed to the slow growth. An implication from this is that the country has to impose structural reforms to enhance the flexibility of the product market.

The EMU was found to contribute to enhanced financial market integration in section 3.5.2, indicating that the increase in the private credit flow during the core-EMU period could be explained by the more integrated financial market. The increased access to credit could explain the large increase in the debt-to-income ratio for firms and household in the crisis-response period. This would indicate that the construction of the EMU contributed to the banking sector problems as it facilitated easier intermediation across borders.

This discussion of the consequences from the imbalances places Italy in category (b) where the EMU membership amplified problems that originated from domestic sources. These domestic sources were slow economic growth, low capital accumulation as well as a pro-cyclical fiscal policy. The EMU membership amplified this as it allowed an enhanced foreign capital inflow due to the more integrated capital market. The implications have been lost competitiveness relative to its trading partners in the EMU as well as in emerging markets, and a large stock of government debt. This has caused the financial market to demand higher long-term interest rates, as displayed in figure 2.18, creating the possibility for a lending crisis.

Italy needs to continue its fiscal consolidation to bring the deficit and debt down, as it led a pro-cyclical fiscal policy. This is also necessary to maintain investors' confidence that will allow refinancing of the government debt. Government expenditures must be reduced and revenue needs to be collected more efficiently. A tax reform is therefore both necessary and will contribute to bring the fiscal budget in surplus and thus eventually be used to decrease the debt.

The revised fiscal surveillance procedure in the SGP will contribute positively to Italy facilitating the above mentioned measures. The macroeconomic surveillance mechanism might not be as important for Italy as the BOT and current account deficit did not deteriorate as much as Spain and Greece's, but the country has already experienced difficulties with debt refinancing. This indicates that the country could benefit from lower risk of a lending crisis by focusing on reduction of the external imbalances.

The continued decline of labor productivity throughout the crisis-response period indicates that the country needs to facilitate technological progress and innovation. The capital inflow has reversed, and Italy could thus need more efficient investment to increase labor productivity.

Italian men and women have the lowest effective retirement ages for all periods, indicating that the country will benefit from a more efficient labor market regulation. That 70 percent of its GDP comes from services indicates that there are large gains to be had from more international competition. This implies that Italy needs to reform the labor market and product market to regain competitiveness relative to the other EU members.

A decomposition of Italy's GDP showed that the country has a relatively large industrial sector, 20 percent of GDP. This indicates that Italy has a potential for increasing merchandise exports and that it should enhance labor productivity to do so. More than half of Italy's merchandise trade in 2010 went to the EU, while it imported 55 percent back (WTO 2011). That 70 percent of its GDP comes from services indicate that there are large gains to be had from more international competition.

As mentioned when reviewing Greece, a common regulatory framework for the European financial institutions is essential to hinder reoccurrence of the external imbalances. Better surveillance and regulation of financial institutions must thus be implemented. It is also necessary to prevent the government from having to intervene and rescue banks.

In conclusion, Italy will benefit from implementation of domestic fiscal reforms to increase the tax base and reduce tax evasion, as well as rising the pension age. In addition, the country needs to comply with the EMU-wide fiscal framework. To facilitate growth, the country

could benefit from implementation of the suggested reform measures in the labor market such as increased wage and contract flexibility. Also, allowing more cross-border competition of public procurement would support this.

#### ***5.1.4 Spain: Unsustainable credit-led growth***

Spain had catching-up potential with the richer northern European countries prior to joining the EMU, as the lower GDP per capita and consumption illustrates. GDP and consumption was expected to converge towards the richer EMU countries and capital was expected to flow into the country. Spain's GDP per capita increased the most of the four countries from the pre-EMU to the core-EMU period and thus converged towards the German and Italian per capita levels. Consumption grew by 53 percent, on average, from the pre-EMU period to the core-EMU period.

Spain is different from Italy and Greece as they were complying with the SGP throughout the core-EMU period. Spain did not have a large deficit or high government debt prior to the financial crisis. The government debt-to-GDP ratio declined throughout the core-EMU period. They were the only country with higher revenues than expenditures in the core-EMU period, meaning that there was a degree of public savings. This relation changed in the crisis-response period, as the deficit and debt grew due to lower revenues and higher expenditures.

Spanish investments increased by 6 percent in the core-EMU period compared to the pre-EMU period, the largest increase of the four countries. Table 4 in section 2.2.2 displayed that inward foreign direct investments from other EU countries were the highest of the sample countries in Spain, during the core-EMU period. The country had the highest increase in government and business investments in the same period, combined with the lowest private saving rate. Gross business investments in Spain increased from the pre-EMU to the core-EMU period by 127 percent, on average, compared to a 9 percent increase in Italy. Spain's current account deteriorated severely in the core-EMU period, as the public savings was not enough to offset the lower private savings.

Spain's volume of exports had a high growth rate in the pre-EMU period, but this rate halved, on average, in the core-EMU period. The same trend can be seen in the volume of imports, but the decline was much smaller. The intra-EU BOT balanced in the pre-EMU period, but became negative in the core-EMU period. The deficit declined in the crisis-response period. Spain's share of intra-EU export decreased slightly during the core-EMU period, while the import share increased, suggesting that the country lost competitiveness.

**Table 11**  
**Economic development in Spain (1992-2011)**

	1992-1998	1999-2007	2008-2011
<b>Internal macroeconomic situation</b>			
GDP per capita <i>current prices, billion euro</i>	11 409	18 961	23 421
GDP <i>growth rate</i>	2,4	3,7	-0,6
Consumption per person <i>current prices, billion euro</i>	9 343	14 289	18 075
Total investment <i>percent of GDP</i>	22	28	25
Government revenue <i>current prices, billion euro</i>	174	313	387
Government expenditure <i>current prices, billion euro</i>	196	310	469
<b>External macroeconomic situation</b>			
Gross saving <i>percent of GDP</i>	21	22	19
Household saving rate <i>percent of disposable income</i>	n.a.	11	15
Total investment <i>percent of GDP</i>	22	28	25
Government structural balance <i>percent of potential GDP</i>	-3,5	-1,2	-6,4
Government debt <i>percent of GDP</i>	60,2	49,3	55,2
Volume of export of goods <i>growth rate</i>	11,6	5,5	2,2
Volume of import of goods <i>growth rate</i>	9,1	8,1	-4,1
Intra-EU BOT	Balance	Deficit	Deficit
Current account balance <i>percent of GDP</i>	-1,1	-5,5	-5,8
<b>Macroeconomic indicators</b>			
Inflation <i>average growth rate</i>	4,0	3,1	2,2
Real exchange rate <i>Index 1999=100</i>	102	106	117
Unit labor costs <i>Index 2005=100</i>	78	95	112
Labor productivity <i>Index EU-27=100</i>	109	102	107
Unemployment rate	21	11	18
10Y Government bond yields	9	4	5
<b>Microeconomic situation</b>			
Household debt-to-income ratio	n.a.	97	127
Firm debt-to-income ratio	n.a.	968	1513
Private credit flow <i>percent of GDP</i>	7,4	21	3,5

Section 2.2.3 showed that Spain did not receive enough net factor income from interest or other investments abroad to offset the deficit on the trade balance, leading to a current account deficit. Spain has been able to narrow the current account deficit since 2007 due to fiscal consolidation and lower imports, as displayed in Table 11.

Constructions' share of GDP was 10 percent, the highest of the sample countries, suggesting that investments went to this sector. The expansion of the construction sector indicates a domestic distortion further enhancing the external imbalances by channeling investments to the non-tradable sector. This is confirmed by the change from balance to deficit in the intra-EMU BOT displayed in Table 11.

The macroeconomic indicators in Table 11 show that Spain's unit labor costs increased in the core-EMU period. The country had the highest inflation rate of the sample countries throughout the core-EMU period and its real effective exchange rate appreciated the most during the same period. This could have contributed to loss of competitive power. The unemployment rate was high in the pre-EMU period, but declined in the core-EMU period, consistent with the high growth rate of the economy. Spanish labor productivity should have increased if the above mentioned higher investments went to improving the capital stock, but the labor productivity fell from the pre-EMU period to the core-EMU period. However, labor productivity has improved in the crisis-response period.

Spain's annual private credit growth tripled from the pre-EMU period to the core period. The coinciding of the expansion in the credit flow with the core-EMU period, suggests that the countries got better access to credit, and that this credit came from the more integrated financial market. This allowed the countries to increase consumption beyond domestic production and created a larger internal imbalance that led to external imbalances as well.

Household debt was high in Spain in the core-EMU period and the debt-to-income ratio increased by 31 percent, on average, after the crisis. Firms' debt-to-income ratio increased by 56 percent, on average, in the corresponding period. This illustrates that the decline in income after the financial crisis lowered Spanish households and corporations' debt serving ability, enhancing the number of losses incurred by the banking sector on loans issued to these firms.

The identified source of internal imbalance in Spain is the expanded construction sector, distorting investment away from the other sectors. In addition, the effect on the banking sector has been severe after the housing bubble burst in the aftermath of the financial crisis, as local banks have a large exposure to the housing market. The high growth rate of the economy did not lead to efficient capital use that could have increased the competitiveness of their tradable sector. A large inflow of foreign capital allowed private consumption growth and led to an external imbalance. In addition, both the intra-EU and overall BOT deficit contributed to a deteriorated current account that made the country dependent on large inflow of foreign capital. The expansion of the non-tradable sector will make it hard to increase real production

capacity for repayment to the foreign creditors. In addition, the country lost competitiveness due to a high inflation rate and unit labor cost growth.

In summary, the domestic sources causing the imbalances were credit-led economic growth, low capital accumulation as well as loss of competitive power. A discussion of the implications of these imbalances follows.

Spanish current account deficits were financed in large parts with portfolio investments and not FDI (Jaumotte and Sodsriwiboon 2010). Strong housing investment in Spain was associated with large contributions to the current account deficits. German and Dutch BOT surpluses financed BOT deficits in Spain and a number of other EMU member countries (Barnes et al. 2010). This suggests that the EMU membership contributed to the current account deficit, through the more integrated financial market in the EMU.

In 2010, Spain exported almost 70 percent of its merchandises to the EU, while it imported close to 60 percent back (WTO 2011). This indicates a high degree of economic integration with the EU. Spain's intra-EU export share decreased slightly during the core-EMU period. However, the country regained its lost share in the crisis-response period. Spain exports more commercial services than it imports and 70 percent of its GDP comes from the service sector. This indicates that the country has potential for export-led growth in the service sector.

Spain has been able to lower their unit costs by more than Greece and Italy in the crisis-response period, but the gap is well above Germany. The improved labor productivity, combined with a lower level of investments, indicates that the country has managed to channel investments more efficiently in the crisis-response period. This suggests that the country's competitive loss is reversible and that the possibility of export led growth is present.

Luico (1998) argued that the Spanish industrial sector has been fragmented and dominated by small firms with unevenly skilled employees, and that the focus on reaching the Maastricht-criteria diverted attention from structural change. The deteriorated BOT during the core-EMU period supports the lack of flexibility in the product market, while the high unemployment rate in the crisis-response period suggests an inflexible labor market. This implies Spain can gain competitiveness by imposing such reforms.

The evidence of the large debt development in the households and firms between the core and the crisis-response period suggests that the inflow of credit was unsustainable. The data provides evidence that suggests the free market of capital flows have contributed to the imbalances and that more regulation is needed.

The review of the consequences of the identified imbalances suggests that Spain falls into category (b) where it was domestic sources such low capital accumulation fueling if a

construction boom as well as a unwillingness to impose structural reforms that led to a deficit position on the current account, but that the domestic imbalances were amplified by the EMU membership, as it allowed an enhanced foreign capital inflow due to the more integrated capital market. The most severe implication is a fragile banking sector as the asset values have declined after the financial crisis.

Spain is an example of a country that has complied with the SGP and still built up internal and external imbalances such as persistently higher than average inflation and increasing current account imbalances. This suggested macroeconomic surveillance procedure and planned scoreboard will be effective measures in the case of Spain.

As Spain experienced a large private credit expansion that appear to have been issued without sufficient risk judgment, a common regulatory framework for the European financial institutions should be implemented to hinder reoccurrence of the external imbalances. Suggested regulation includes a common framework for bank resolution, crisis resolution and more centralized supervision. Implementations of these measures would reduce the likelihood for the government or the EU institutions having to intervene and rescue Spanish banks.

The public debt increased quickly in the crisis-response period and seems to rise faster than both GDP and the country's debt-servicing ability. Therefore implementation of reforms to increase economic growth will be necessary. More efficient investments will be necessary to facilitate growth. The large construction share of GDP should be reversed to the industry or the service sector

Table 11 displays a large increase in government expenditures during the crisis-response period. Spain could thus benefit from implementation of a tax reform that raise the tax base and make tax evasion less widespread. In addition, higher labor mobility will relieve the pressure on the Spanish expenditure system. This suggests continuing the harmonizing of labor regulation across the EMU as well as the benefit system, making the latter less dependent on having established a residency.

In conclusion, Spain will benefit from implementation more investments in other sectors of the economy than construction. The country will also benefit from an EMU-wide harmonized benefit system, as the large unemployment is likely to lead to migration. The development in Spain illustrates the need for EMU-wide financial regulatory framework to minimize the risk of a reoccurrence as well as a common crisis resolution framework in the event of large-scale bank failure.

## **5.2 General results**

The case study provided the insight that it was not the failure to comply with the optimal currency area criteria that led to the sovereign debt crisis in 2009. It was instead triggered by the 2008 financial crisis, but caused by underlying imbalances that revealed themselves when the countries could no longer access the financial market.

Germany has undergone major reforms to enhance labor market efficiency, and this has contributed to a higher exporting ability as the reforms have kept wages and therefore costs low (Boysen-Hogrefe and Groll 2010). Regarding the future of the EMU, the case of Germany suggests that there indeed is the continued possibility of a monetary union in Europe, given that regulations are adhered to and rules are followed as well as implementation of the suggested reforms.



## 6. Conclusion

This thesis has investigated the development of internal and external macroeconomic imbalances in the European Economic and Monetary Union. The aim was to answer whether the historic construction of a monetary union among sovereign states is a realistic project, or if it is doomed to fail. The motivation was to understand the sources and time of occurrence of the imbalances, which caused the current problems of high sovereign-debt, high unemployment and declining economic growth in the southern European countries. Understanding this has implications for the long run survival of the EMU, as well as for how to construct other potential monetary unions between sovereign states.

To provide theoretical contexts for the EMU, the costs and benefits of the different fixed exchange rate regimes, including a monetary union, have been examined. In addition, the relevant literature of optimum currency areas necessary to counteract the loss of an autonomous monetary policy and the nominal exchange rate was reviewed. The EMU was found to fulfill these criteria to a satisfactory degree, which should have led to strengthened economic convergence. However, a divergence occurred, causing the need to identify problems developed in the EMU other than those addressed by the economic theory. These issues were found to be related to domestic fiscal policies, the development of trade deficits and loss of competitiveness, domestic policies hindering labor mobility as well as failure of correct risk assessment by financial intermediates. The institutional set-up created by the EU to counteract these practical problems was then presented, as well as the suggested policy measures by the EU institutions and the IMF to stabilize the current situation and to prevent reoccurrence.

Answering if the EMU is a feasible project made it necessary to clarify whether the development of imbalances was (a) the result of domestic sources, (b) the result of domestic sources amplified by EMU membership, or (c) the result of these countries joining the EMU, regardless of their domestic state of affairs prior to membership. The method used was a country-specific case study of Greece, Italy and Spain, that highlights the differences and similarities of macroeconomic and microeconomic variables as well as policies between the countries from 1992 to 2011. The main variables examined were fiscal variables such as debt, deficit and the value of trade as well as macroeconomic indicators such as inflation, unit labor costs and long-term interest rates. To reveal when the imbalances started to develop the sample years were divided into three periods: a pre-EMU, a core-EMU and a crisis-response period.

The outcome of the case study of Greece revealed that the country is not integrated enough with the other EMU countries regarding their volume of intra-EU trade. The country clearly violated the premises stated in the SGP, as the EMU membership allowed easier access to credit from the convergence of the long-term interest rate with the much lower German level. The continuation of the pro-cyclical fiscal behavior from the pre-EMU period into the core-EMU period indicates that the moral hazard incentives from joining EMU were not properly addressed. The examination places the country in category (b) where the EMU membership amplified the existing domestic imbalances of pro-cyclical fiscal policy, leading to large current account deficits that placed the country in a risky position if foreign investors stopped being willing to lend to the country. On this basis it may be inferred that the control mechanisms of the member countries' fiscal policy were too weak, relative to the large negative spillover effects from excessive public borrowing by one member country. The case of Greece suggests that a common fiscal framework must be followed for a monetary union among sovereign states to be sustainable in the long run.

Italy did not comply with the fiscal framework outlined by the SGP; rather it led a pro-cyclical fiscal policy that could be sustained as the risk premium converged to the German level. Italy experienced large capital inflows but the investments were not allocated efficiently, as their labor productivity declined. The country experienced low economic growth relative to Greece and Spain, in addition to a deteriorated trade position. The investigation of Italy highlights the importance of allowing the labor and product market to become more flexible when surrendering the possibility of devaluating the exchange rate. The evidence indicates that Italy must be placed in category (b) with internal sources leading to the external imbalances, but that these sources were amplified by the EMU membership when the country did not implement reforms to enhance efficiency.

Spain complied with the fiscal framework outlined by the SGP. The country was found to have experienced an unsustainable credit-led growth, particularly expanding the non-tradable sector that severely affected the solvency of domestic banks after the financial crisis. The high GDP growth rate did not lead to real productivity growth and the external financing of the BOT deficit placed the country in a risky position if foreign investors stopped being willing to fund the deficit. This imbalance was caused by the increased access to foreign credit that coincided with the core-EMU period. On the basis of the presented evidence, Spain can be placed in category (b), as the EMU membership was found to have intensified investment activity, amplifying internal imbalances and contributing to external imbalances.

In addition, all three countries were found to have endured a higher unit labor cost growth relative to Germany, serving as a benchmark, causing above average inflation and an appreciation of the real exchange rate. The completion of the three stages of EMU led to a more integrated European financial market that allowed a widening of the domestic saving and investment gap in the southern countries. The sample countries had declining public and private saving rates in the core-EMU period coupled with increased investment that was not used to accumulate capital. This made it difficult to compete with the more capital abundant northern European countries as well as the emerging markets, and indicates that the monetary union could have benefited from further harmonized market regulation prior to entering the final stage of the EMU in 1999.

Italy and Greece exemplify that a monetary union between sovereign states is doomed to fail without a centralized fiscal policy system when the regulatory framework lacks strong sanction possibilities. This is due to moral hazard on both the lending side represented by the financial institutions and on the borrowing side represented by the governments. The presented evidence suggests that stronger financial regulation and stricter sanctions in the SGP are needed if the EMU is to survive in the long run. Spain, on the other hand, suggests that a monetary union is not doomed to fail per se, but supports the need for stronger financial regulation.

It is evident from this review that a monetary union between sovereign states requires an efficient implementation of a supranational institutional set-up. The policy implications that inform this is that the EMU does not need to form a federal state or a fiscal union to survive in the long run if the new macroeconomic surveillance regime, as well as the SGP, is obeyed to by all member states. The EMU will benefit from implementing more harmonized labor market regulations, and more equal cross-country benefit structures, as well as require regulation on bank equity behind government bonds.

The main findings of this study can be generalized to other potential monetary unions in the making without a fiscal union. However, this study has been limited to a few EMU member states with the focus on three southern countries that have developed large external imbalances and experienced problems with access to the sovereign debt market. This leaves considerable work to be done to determine the whole cause of the development of imbalances. It remains to be seen whether the reformed fiscal framework in the EMU will cure as well as hinder reoccurrence, or if the EMU will have to move closer towards a fiscal union. Further research could therefore concentrate on assessing the economic benefits and costs of the EMU

moving towards an American system of federal states or strengthening the regulatory framework while remaining sovereign states.

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