Should Greece stay or leave the eurozone?: The case of the financial crisis in Greece

Bør Hellas bli eller forlate eurosonen?: Finanskrisen i Hellas

Malene Sønstegård

Norwegian University of Life Sciences
School of economics and business
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The thesis is an independent study, where I alone am the responsible for what is written.

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Malene Sønstegård

Abstract

The financial crisis that hit the US in 2007 has had large consequences for the economy in Europe. In the European Union many countries have experienced the recession in terms of large amounts of government debt and high unemployment. Some member states have required emergency assistance from the IMF, the ECB and the EU, the first country that needed this kind of help was Greece. This thesis is a case study of Greece's economic situation as part of a monetary union, and studies whether Greece should stay of leave the eurozone in terms of costs and benefits.

Greece has a history of running budget deficit and large amounts of government debt. There were many doubts of including them in the eurozone because of their weak economy, and it has later been revealed that they tricked with their numbers to be approved. In this study the focus is specially directed on the economic history of Greece, the eurozone as a monetary union, the development in microeconomic indicators in Greece in the period 1990-2011, the theory of optimal currency areas and the actions taken to solve the financial crisis.

In the eurozone the member states have surrendered their monetary policy and entered a fixed exchange regime, while maintaining an autonomous fiscal policy. When the recession reached Greece, the deficit increased, the government debt accumulated and the country diverged from the other member states. Without having any monetary policy instruments available, Greece in the end had no other choice than to ask for financial assistance. The ECB, IMF and EU agreed to bail them out, but in return Greece had to impose austerity measures that have tightened the Greek economy. The unemployment in the country has reached record high levels and the GDP growth has been negative each year since 2007 until 2012. The question is whether Greece should keep fighting to stay in the Eurozone or if they should leave.

To answer this question, an analysis of the costs and benefits of being a eurozone member has been implemented. The theory of monetary unions and the necessary characteristics of an optimal currency area have been used to lighten some of the aspects of being a eurozone member. The results are that Greece does not seem to form an optimal currency area with the rest of the eurozone member states. The country is relatively closed, is likely to experience asymmetric shocks and has low flexibility. In addition, the bailout package in 2010 does not seem to have fulfilled its purpose; the large effects have failed to appear. There are also signs of fragility in the whole eurozone, as the countries have maintained their autonomous fiscal policy and seem to be experiencing the recession in very dissimilar ways. Greece's future in the eurozone seems fragile after these analyses, but there do however not seem to be any good alternatives.

Sammendrag

Finanskrisen som brøt ut i USA i 2007 har hatt stroe konsekvenser for økonomien i Europa. Mange av medlemslandene i EU har merket nedgangstidene i form av store mengder statsgjeld og høy arbeidsledighet. Noen medlemsland har måttet motta krisehjelp fra det internasjonale pengefondet, den Europeiske sentralbanken og EU, og Hellas var det første landet som trengte økonmisk assistanse. Denne masteroppgaven er en case-studie av den økonomiske situasjonen i Hellas med tanke på at landet er en del av en pengeunion. Den tar for seg om Hellas bør bli eller forlate eurosonen med utganspunkt i kostnader og fordeler ved å fortsette å være en del av pengeunionen.

Hellas har en historie med budsjett underskudd og oppbygging av store mengder gjeld. Den svake økonomien deres sådde stor tvil rundt om de burde inkluderes i eurosonen eller ikke. I senere tid har det kommet frem at de jukset med tallene sine for å bli godtatt som medlem. I denne studien er fokuset spesielt rettet mot den økonomiske historien til Hellas, eursonen som pengeunion, utviklingen i mikroøkonomiske indikatorer i Hellas i perioden 1990 – 2011, teorien om optimale valutaområder og hva som har blitt gjort for å løse denne finanskrisen.

Medlemslandene i eurosonen har gitt opp deres suverene pengepolitikk og gått inn i et fast valutakurs regime, mens de har beholdt sin selvstendige finanspolitikk. Da nedgangstidene nådde Hellas, økte underskuddet, statsgjelden akkumulerte og landet divergerte fra de andre medlemslandene. Siden pengepolitikk ikke lenger var et tilgjengelig verktøy måtte Hellas til slutt be om finansiell assistanse. Den europeiske sentralbanken, det internasjonale pengefondet og EU ble enige om å redde dem ut av krisen, men til gjengjeld ble Hellas pålagt strenge innstrammingstiltak som har strammet til den greske økonomien. Arbeidsledighetsraten i landet har nådd rekordhøye nivåer og BNP veksten har vært negativ hvert år siden 2007 til 2012. Spørsmålet er om Hellas bør fortsette å kjempe for å bli i eurosonen eller om de bør forlate den.

For å svare på dette spørsmålet har det blitt utført en analyse av kostnadene og fordelene ved å være et medlem av eurosonen. Teorien om pengeunioner og nødvendige egenskaper for å være i et optimalt valutaområde har blitt brukt for å belyse noen av aspektene ved å være et eurosone medlem. Resultatene er at Hellas ikke ser ut til å danne et optimalt valutaområde sammen med de andre medlemslandene. Landet er relativt lukket, har stor sannsynlighet for å bli utsatt for flere asymmetriske sjokk og har lav fleksibilitet. I tillegg ser det ikke ut til at redningspakken i 2010 fungerte som man håpet på, de store effektene uteble. Det er også indikasjoner på skjørhet i hele eurosonen, med tanke på at meldemslandene har beholdt sin uavhengige finanspolitikk og ser ut til å opleve nedgangstidene på veldig forskjellige måter. Hellas sin fremtid i eurosonen ser derfor skjør ut etter disse analysene, men det ser heller ikke ut til å være noen gode alternativer.

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Chapter 1 Introduction

1.1 General problem

Greece is a member of the European Union and the single currency area referred to as the eurozone area. The country was initially refused membership into the eurozone in 1999, due to its weak economy. But only two years later, Greece was accepted, and joined the eurozone on January 1st, 2001. The concern regarding the Greek economy remained, and when the global economic crisis hit in 2007, the political and macroeconomic shortcomings of the country became apparent. After many years of excessive spending, the country ran repeated budget deficits, and accumulated a large public debt. The government's gross debt as a percentage of GDP rose from 103.7 in 2001 to 174.7 in 2012 (Eurostat, 2013).

The accumulation of debt in Greece is a result of decades of spending and borrowing under different political regimes. During the administration of Prime Minister Andreas Papandreou from 1981-90 the government implemented an excessive expenditure program. This increased the public debt from 39.4 percent of GDP in 1980 to 111.6 percent in 1990, and did not result in any revenue increases. After almost a decade under the regime of Papandreou, inflation in Greece became ingrained. During the 1980's prices rose by an annual rate of 18.6 percent (Matziorinis, 1993).

In the following years, successive governments ran budget deficits and accumulated a large public debt. When Greece joined the eurozone in 2001 there were worries regarding their inflation rate, and economic output per head. In other countries, output per head was on average, 30 percent higher than in Greece (James, 2000).

From 2004 and up until the crisis the conservative governments of Kostas Karamanlis, and its successor led by George Papandreou, took measures to restore economic credibility. Karamanlis and Papandreou raised taxes, reformed the tax system and made cuts in the

expenditure. When the crisis hit in 2007 these cuts were considered inadequate. The markets and Brussels demanded even deeper budget cuts. For ordinary Greeks life has become worse. Companies, shops, cafes and restaurants have been forced to close, or are half empty. It has become more difficult to get bank loans, and Greeks have had to reduce their private spending. The cuts in public spending and deficit eventually led to a huge strike among Greek citizens in 2010 (Harding, 2012).

1.2 Macroeconomic problems resulting from fiscal mismanagement

Greece has had a government deficit in each year since 2000, which means the general government sector has spent more money than it collected in revenue. From 2000 until 2007 the deficit was around 5 percent of GDP (Eurostat, 2013). In 2009 it reached a peak at 15.6 percent of GDP, four times more than the eurozone's limit. Then it actually decreased to 9.4 percent from 2009 to 2011. The general government gross debt was around 100 percent of GDP in each year from 1995 to 2007, but experienced a large increase in the years since 2008. In 2011 and 2012 it has grown to a level higher than 170 percent of GDP (European Commission, 2013). In addition, the unemployment rate increased each year since 2007, reaching 26.8 percent in October 2012, an all-time high in the European Union (BBC News, 2013).

In 2010 it became clear that Greece could not handle their debt and that they needed help from the EU and IMF. But this help did not come for free. Additional austerity measures from Greece were requested. In times of recession, austerity measures that require cuts in public spending are tough for an economy. It is in "tight" economic times that the government should run an expansionary fiscal policy to promote growth (Steigum, 2004).

Greece received two bailout packages, one in 2010 and another in 2012 and partially defaulted on their debt in 2011.

When the housing and financial crisis hit the US in 2007, the panic spread quickly. Big European economies started injecting money in to their banking systems. The global recession provoked liquidity constraints in the credit markets, and it seems as if this served as a catalyst for the concerns about the debt level in many of the countries in the eurozone. In Greece debt had grown to 107 percent of GDP in 2007, and it brought the validity and stability of the euro and the euro area into doubt. Since late 2009 there have been increasing fears of a sovereign debt crisis within the eurozone that will put the zone at a future risk. It is not only Greece that has struggled with a large government debt. Increases in the sovereign debt load have been a growing problem for the currency union as a whole. In April 2009, the EU ordered France, Spain, the Irish Republic and Greece to reduce their budget deficits (BBC News, 2012). Since April 2008 the global market has become ever more concerned about the size of the public debt in Greece, and how a Greek default might affect the wider eurozone. This uncertainty has a self-fulfilling effect, and continues to instill fear and distrust in Greece's financial legitimacy amongst the international community. Since Greece is part of a monetary union, the fear and distrust quickly spreads to other countries in the union with similar economic problems.

The purpose of this thesis is to review and analyze the financial crisis in Greece, with the aim of answering whether the country should stay within the eurozone or not. It is assumed that the alternative is leaving the eurozone, but still be a member of the EU. To make any conclusions on this matter the thesis intends to address the macroeconomic situation since the early 1990s during the first stage of the European Monetary Union up until 2007 and the period after the recession until 2012. The measures taken to solve the crisis also need to be analyzed to ascertain whether these have worked as intended, and/or to determine whether the

effectiveness can be measured in their long-term effect. It is quite different to cope with an economic recession for a country that is part of a monetary union than one that "stands alone". This thesis will look at the theory behind a monetary union, focusing on conditions for an optimal currency area when the national monetary policy tool is lost, and the constraint on fiscal policy within this kind of union. This will allow an examination into how the eurozone fits in to this theoretical framework since the establishment of the euro in 1999 until 2012. Greece's macroeconomic situation is analyzed in terms of its effects on the currency area. Relevant questions to consider are: What are the costs and benefits for Greece by staying in the monetary union? What has been done to prevent a Greek exit from the eurozone?

Many economists and analysts expected that Greece would default on their debt and leave the eurozone during 2012. In May 2012, economists at Bank of America said that Greece could potentially run out of money in June 202 if the crisis intensified (The Telegraph, 2012). Paul Day, Chief Strategist at Market Securities who was interviewed on CNBC in August 2012 was quoted on their webpage saying:

> "It's a question of when Greece will exit the eurozone, not if. Next month (September, 2012) there is the ratification of the European Stability Mechanism (ESM) in Germany and you may well see a situation where Greece leaves the euro, the ESM is ratified and Spain and Italy then go in and ask for the money. There is a feeling that time is running out."
>
> (CNBC, 2012)

Citigroup's boss, Michael Saunders, said that Greece would exit the eurozone on January 1, 2013 (Daily Mail, 2012). Other economists said Greece should not be allowed to leave. Mario Blejer in the *Financial Times* said Greece could not leave the eurozone, as this was bound to generate contagion throughout the eurozone and to raise the probability of a collapse, by

proving Europe's unwillingness to pay for its political endeavor (Blejer, 2012). "There is no time to lose," leader of the euro group, Jean-Claude Juncker, warned in August 2012. Leaders must use "all means at their disposal" to save the currency union, he told *Der Spiegel*. In the same article it was noted that "The European Central Bank is now taking risky measures to help save Athens from its acute financial emergency" (Der Spiegel, 2012). So, how have the strategies implemented so far worked? Do the tools used to stabilize Greece have a long-term effect? And how has the demanded austerity measures affected the Greek economy?

This thesis draws upon lessons and experiences from the creation of what has been called "incomplete" monetary unions, like currency pegs, which have failed in the past. There are many examples of these kinds of regimes that have proven to be fragile. An interesting question is why some pegged exchange rate regimes turn out to be so fragile? Do some of these problems also exist for Greece and the eurozone? Understanding how these countries' hands were tied, in terms of the policy options that were available when they experienced a recession, gives an interesting insight in to the macroeconomic situation facing Greece.

1.3 Organization of the thesis

This thesis is organized into the following chapters. Chapter 2 provides background into Greece's macroeconomic performance before its membership of the eurozone and since 1990 until 2012. Some political historical context is given to highlight the development of the underlying crisis. In chapter 3 the theory of optimal currency areas is used as a framework with which to formulate the current problem. A broad theoretical discussion and historical context of the fragility of fixed exchange regimes is provided to consider the currency board in Argentine and Hong Kong. Chapter 4 develops a framework by which to analyze the costs and benefits of Greece staying in the eurozone, and presents the eurozone's history and its

fiscal policy. It also presents the actions taken to solve the crisis. Chapter 5 provides an analysis of whether it is beneficial for Greece to stay in the eurozone and the results of the bailout package in 2010. Chapter 6 is the conclusions and suggestions for future work.

Chapter 2 Background

2.1 Political history of Greece

Greece has a history of decades of economic hardship. Before the recession in 2007-08, they defaulted on their debt in 1826, 1843, 1860, 1894 and 1932 (Crozier, 2011). In the 1980s Prime Minister Andreas Papandreou increased the public debt from less than 40 percent of GDP to over 110 percent in a decade. This became a tendency for the Greek governments, which ran budget deficits and accumulated public debt.

Prime Minister Konstantinos Mitsotakis continued the borrowing during 1990-93, before Papandreou again became prime minister in 1993. Three years later, Costas Simitis took office. During 1996 – 2004 the country's official macroeconomic statistical indicators were falsified. Table 2.1 shows selected macroeconomic data for Greece. The data on general government deficit and gross debt during 1996-2004 are the revised indicators as the data initially reported were falsified. For 1997 -99 the deficits were initially reported to be 4.0, 2.5 and 1.8 percent of GDP, respectively, while the debt levels were reported to be 108.2, 105.8 and 105.2 percent. The deficits notified to the Commission for 2000, 2001 and 2002 were also revised upwards by more than two percentage points of GDP. The government deficit for 2003, which was initially reported at 1.7 percent of GDP, stood at 4.6 percent of GDP after the September 2004 notification (Eurostat, 2004). In 2006 Eurostat concluded that the public deficit of the Greek economy amounted to a number almost twice the size presented by the Simitis government (European Commission, 2004).

The revised numbers shows that the Greece's incorporation to the eurozone in 2001 was based on a false foundation (Eurofound, 2011).

From 2004 to 2011, there was a change in how the prime ministers governed the country's economy. Prime Ministers Kostas Karamanlis and George Papandreou reduced expenditures

and raised taxes to restore economic credibility. For the citizens of Greece, this meant increased unemployment and less spending. In October 2012 unemployment hit record levels with more than 26 percent out of work (BBC News, 2013).

Table 2. 1 Macroeconomic statistics in Greece, 1990 -2011

Time	Real GDP Growth	General government deficit % of GDP	General government gross debt % of GDP	Average inflation (CPI)	Maastricht bond yield	Unemployment rate
1990	0,0	-16,1	90,1	20,3	No data available	6,8
1991	3,1	-11,5	92,3	19,6	No data available	7,4
1992	0,7	-12,6	98,8	15,9	24,1	8,4
1993	-1,6	-13,8	111,6	14,5	23,3	9,3
1994	2,0	-10,0	109,3	10,9	20,7	9,3
1995	2,1	-10,3	110,1	9,0	17,0	9,1
1996	2,4	-7,5	111,6	8,2	14,4	9,8
1997	3,6	-6,6	114,0	5,6	9,9	9,8
1998	3,4	-4,3	112,4	4,8	8,5	11,1
1999	3,4	-3,4	112,3	2,6	6,3	12,0
2000	3,5	-3,7	103,4	3,2	6,1	11,2
2001	4,2	-4,5	103,7	3,4	5,3	10,7
2002	3,4	-4,8	101,7	3,6	5,1	10,3
2003	5,9	-5,6	97,4	3,5	4,3	9,7
2004	4,4	-7,5	98,9	2,9	4,3	10,5
2005	2,3	-5,2	101,2	3,6	3,6	9,9
2006	5,5	-5,7	107,5	3,2	4,1	8,9
2007	3,5	-6,5	107,2	2,9	4,5	8,3
2008	-0,2	-9,8	112,9	4,2	4,8	7,7
2009	-3,1	-15,6	129,7	1,2	5,2	9,5
2010	-4,9	-10,7	148,3	4,7	9,1	12,6
2011	-7,1	-9,4	170,6	3,3	15,8	17,7
2012	-6,4	No data available	174,7	1,5	22,5	24,3

Source: EMI Report, March 1998, IMF and Eurostat

2.2 History of Greece's membership in the EU/EMU

The objective of the progressive realization of EMU was confirmed already in June 1988 by the European Council. The President of the European Commission was together with a committee, set to study and propose concrete stages leading to this union. The formation of an economic monetary union was to be achieved in three stages. Stage one, set to begin on 1 July 1990, included four objectives: 1) the complete freedom for capital transactions; 2) increased co-operation between central banks; 3) the free use of the ECU, the European Currency Unit, forerunner of the euro; and 4) improvement of economic convergence. Stage 2 was started with the establishment of the European Monetary Institute (EMI) on 1 January 1994. The granting of central banks credits was banned, and co-ordination of monetary policies was increased. Stage two also included strengthening of economic convergence and a process leading to the independence of the national central banks. The third and final stage began 1 January 1999 with the irrevocable fixing of the exchange rates of the currencies of the 11 Member States initially participating in Monetary Union and with the conduct of a single monetary policy under the responsibility of the ECB (European Central Bank, 2013).

EC treaty outlined the conditions that were required before a member state of the EU could take part in the eurozone. There was convergence criteria required to be met as prescribed by the EC Treaty, Article 140 TFEU, Articles 1-4 of the Protocol on Convergence Criteria. The criteria are that:

- government deficit must not exceed 3 percent of GDP
- government debt must not exceed 60 percent of GDP
- there must be a sustainable degree of price stability and an average inflation rate, observed over a period of one year before the examination, which does not exceed by

more than 1.5% that of the three best performing Member States in terms of price stability

- there must be a long-term nominal interest rate, which does not exceed by more than 2% that of the three best performing Member States in terms of price stability
- the normal fluctuation margins provided for by the exchange rate mechanism on the European monetary system must have been respected without severe tensions for at least the last two years before the examination (Eurofound, 2011).

By the deadline of the last stage of EMU, 1 January 1999, Greece failed to meet the economic tests of low inflation and government debt and deficits (see table 2.1), and was rejected membership of the eurozone area. To qualify for euro membership, the Greek Government had to adopt a tough austerity program, making deep cuts in public spending. However, the government falsified their macroeconomic data on government deficits and debt between 1997 and- 2003, and on these falsified numbers they were approved for membership to the eurozone in 2001. At that time it seemed as if they met the deficit criteria, and that they were moving in the right direction by decreasing their government debt. Greece still had one of the highest inflation rates in Europe, and their government debt was also much higher than was normally permitted under the EU rules governing entry to the eurozone. This made investors worry about sending the wrong signals, suggesting that in the future, other weaker economies might be allowed in without complying fully with membership conditions (BBC News, 2001).

Table 2.2 shows the macroeconomic indicators for selected countries in the eurozone. It is divided into three periods. The first period shows convergence in the variables in the lead up to the introduction of the euro (in compliance with treaty requirements), the second shows the period of relative stability 2000-2007, and the last period is post -2007 when the financial crisis broke loose. To make congruent comparisons through the thesis the same countries are

employed all the way: Germany, Italy, France, Spain, and Ireland. Ireland is included because of its interesting economy, with respect to how it was affected by the financial crisis in 2007. The country experienced a collapse of the property bubble in 2008, and after 24 years of continuous growth Ireland experienced a recession. Narrowing the countries in the eurozone down to just six will give the information necessary, but in a clearer way than a showing table and figure with all the 17 countries.

Table 2. 2 Macroeconomic indicators for the eurozone and selected countries in the eurozone, 1995-2012

	GDP Real growth rate						General government deficit/surplus in % of GDP					
TIME/GEO	Eurozone	Germany	Ireland	Spain	France	Italy	Eurozone	Germany	Ireland	Spain	France	Italy
1995	1,2	1,4	8,9	4,8	1,7	2,9		-9,5	-2,2	-7,2	-5,5	-7,4
1996	1,3	0,5	8,6	2,3	0,7	1,1	-4,3	-3,4	-0,3	-5,5	-4,0	-7,0
1997	2,3	1,5	10,4	3,6	1,8	1,8	-2,8	-2,8	1,0	-4,0	-3,3	-2,7
1998	2,6	1,9	7,2	4,1	3,0	1,4	-2,3	-2,3	2,2	-3,0	-2,6	-2,7
1999	2,6	1,8	9,9	4,2	2,8	1,4	-1,5	-1,6	2,6	-1,2	-1,8	-1,9
2000	3,4	2,9	9,3	4,2	3,0	3,6	-0,1	1,1	4,7	-0,9	-1,5	-0,8
2001	1,5	1,3	3,7	2,5	1,1	1,8	-1,9	-3,1	0,9	-0,5	-1,5	-3,1
2002	0,4	-0,2	3,8	1,2	0,2	0,1	-2,6	-3,8	-0,4	-0,2	-3,1	-3,1
2003	0,1	-0,4	2,2	1,4	0,2	-0,8	-3,1	-4,2	0,4	-0,3	-4,1	-3,6
2004	1,6	1,2	2,6	1,6	1,8	0,7	-2,9	-3,8	1,4	-0,1	-3,6	-3,5
2005	1,1	0,7	3,5	1,9	1,1	0,2	-2,5	-3,3	1,7	1,3	-2,9	-4,4
2006	2,7	3,8	2,9	2,5	1,8	1,6	-1,3	-1,6	2,9	2,4	-2,3	-3,4
2007	2,4	3,4	2,9	1,6	1,7	0,9	-0,7	0,2	0,1	1,9	-2,7	-1,6
2008	-0,2	1,3	-3,8	-0,7	-0,6	-1,9	-2,1	-0,1	-7,4	-4,5	-3,3	-2,7
2009	-4,7	-4,8	-6,0	-4,4	-3,7	-6,1	-6,3	-3,1	-13,9	-11,2	-7,5	-5,4
2010	1,7	4,3	-0,9	-0,6	1,1	1,2	-6,2	-4,1	-30,9	-9,7	-7,1	-4,5
2011	1,1	3,0	1,1	0,3	1,1	0,0	-4,1	-0,8	-13,4	-9,4	-5,2	-3,9
2012	-0,9	0,5	0,3	-1,5	-0,5	-2,6						

	General government goss debt as % of GDP						Inflation annual average rate of change					
TIME/GEO	Eurozone	Germany	Ireland	Spain	France	Italy	Eurozone	Germany	Ireland	Spain	France	Italy
1995	72,0	55,6	80,1	63,3	55,5	120,9	2,4	1,5	2,3	4,6	1,8	5,4
1996	73,7	58,5	72,3	67,4	58,0	120,2	2,4	1,2	2,2	3,6	2,1	4,0
1997	73,2	59,8	63,5	66,1	59,2	117,4	1,7	1,5	1,3	1,9	1,3	1,9
1998	72,8	60,5	53,0	64,1	59,4	114,2	1,2	0,6	2,1	1,8	0,7	2,0
1999	71,7	61,3	47,0	62,4	58,9	113,0	1,2	0,6	2,5	2,2	0,6	1,7
2000	69,2	60,2	35,1	59,4	57,3	108,5	2,2	1,4	5,3	3,5	1,8	2,6
2001	68,2	59,1	35,2	55,6	56,9	108,2	2,4	1,9	4,0	2,8	1,8	2,3
2002	68,0	60,7	32,0	52,6	58,8	105,1	2,3	1,4	4,7	3,6	1,9	2,6
2003	69,2	64,4	30,7	48,8	62,9	103,9	2,1	1,0	4,0	3,1	2,2	2,8
2004	69,6	66,2	29,5	46,3	64,9	103,4	2,2	1,8	2,3	3,1	2,3	2,3
2005	70,3	68,5	27,3	43,2	66,4	105,7	2,2	1,9	2,2	3,4	1,9	2,2
2006	68,6	68,0	24,6	39,7	63,7	106,3	2,2	1,8	2,7	3,6	1,9	2,2
2007	66,4	65,2	25,1	36,3	64,2	103,3	2,1	2,3	2,9	2,8	1,6	2,0
2008	70,2	66,8	44,5	40,2	68,2	106,1	3,3	2,8	3,1	4,1	3,2	3,5
2009	80,0	74,5	64,9	53,9	79,2	116,4	0,3	0,2	-1,7	-0,2	0,1	0,8
2010	85,4	82,5	92,2	61,5	82,3	119,2	1,6	1,2	-1,6	2,0	1,7	1,6
2011	87,3	80,5	106,4	69,3	86,0	120,7	2,7	2,5	1,2	3,1	2,3	2,9
2012							2,5	2,1	1,9	2,4	2,2	3,3

Source: Eurostat

Real GDP growth rates do not show any obvious sign of convergence in the first period. However, the general government deficit/surplus all move in the same direction in this period. All countries reduced their deficit from 1995, and in 1999 they passed the criteria for eurozone approval. The same movement can be seen in the Greek indicators in Table 2.1, but as previously mentioned, they did not meet the criteria stating government deficit must not exceed 3 percent of GDP. As for the government debt in this period, Germany, Ireland, Spain and France moved very close to the criteria of a maximum of 60 percent of GDP. In 2000, all four countries had reached the limit. Italy was in the same position as Greece, with government debt exceeding 100 percent of GDP. However, as the data show, Italy reduced their debt each year in this first period, while Greece approximately stayed at the same level. It is also worth noting that the eurozone average was actually above the 60 percent limit. When it comes to the inflation rate, the criteria say this needs to be stable. There was some fluctuation in inflation in the first three years in Table 2.2, but in the last three years of the period the fluctuations were stable and under one percent. Meanwhile, Greece experienced

another trend. The country had inflation as high as 20 percent in 1990, but gradually moved downwards each year until the country reached 2.6 percent in 1999. Naturally Greece cannot be said to have a stable inflation rate, but it does show a stabilizing tendency.

In the next period there was more stability in the macroeconomic indicators. In Germany the GDP growth rate was stable even before the eurozone was created, and it continued this way in the second period. The other four countries and the eurozone average clearly showed a more stable GDP growth rate than in the first period. From 2000-01 the growth rate declined in all countries, Ireland had the largest decline where the growth rate moved from 9.3 to 3.9. For all countries the rate stayed around the 2001-level for the rest of the period. The rate in Greece was generally higher than in the countries represented in Table 2.2, but it was stable. The government deficit/surplus data showed the same tendency as the GDP growth rate. All five countries and the eurozone average lies on a stable level, between 4 percent surplus and 3 percent deficit. Greece however, did not follow this level. Their deficit was above 3 percent of GDP each year in this period, and in 2007 it exceeded 6 percent of GDP, double the accepted limit in the eurozone. Government debt in the second period showed a slightly different pattern. Ireland and Spain decreased their debt level whit 10 and 23 percent respectively, while the debt level in Germany and France increased by approximately 5 percent. In the eurozone the government debt experienced a small average decline during the period, while Italy and Greece both had increases and decreases in their debt level. Greece ended up with government debt of 107 percent of GDP, and Italy 103 percent. Inflation in these countries was fairly stable from 2000-07, except in Ireland where the rate increased a couple percent the first four years. However, the rate fell to a level of around 2 percent, and in 2007 all the countries in Table 2.2 had inflation near this level. This is also the case for the eurozone average. In Greece inflation was close to 1 percent higher than this.

The last period of Table 2.2 reflects the economic changes after the recession hit in 2007. All countries, except Germany, moved from a stable GDP growth rate to a negative rate in 2008. In 2009 Germany joined the other countries and had a negative GDP rate on 4.8 percent. The largest GDP decline was found in Italy with 6.1 percent. However, there were positive changes already the next year. In 2010 the eurozone average had a positive GDP growth rate, and the same were for Germany, France and Italy. Ireland and Spain still experienced a negative development, but a much smaller change than the year before. This was not the case in Greece. The GDP declined additionally each year from 2008, and reached 6.4 percent decline in 2012. The government deficit/surplus data clearly suggest a global recession. In 2008 each country had an increasing deficit compared to the year before, and in 2009 this was aggravated. The eurozone average government deficit was already twice the accepted size of 3 percent. Spain had reached a deficit of 11.2 percent of GDP and Ireland 13.9 percent. The highest deficit was in Greece where it reached 15.6 percent of GDP. In 2010 all the countries had reduced their deficits, except Ireland which exceeded a government deficit on 30 percent of GDP. In 2011 Germany had reduced its deficit to 0.8 percent and again fulfilled the eurozone criteria. All the other countries in Table 2.2, together with Greece, moved in the same direction, but continued to have a deficit above the 3 percent limit. The eurozone average was still above 4 percent of GDP, but on its way down. Spain, Greece and Ireland stood out with deficits of more than three times the accepted level. The general government debt indicator pointed out large changes after the recession broke out. Each country in Table 2.2 had increasing debt levels in the period after 2007, some to a higher degree than others. The eurozone average went from 70 percent of GDP to 87 percent in the years from 2007-11. Just as with the deficit level, Ireland experienced the largest increase in government debt, compared with the other countries. From a government debt of 44.5 percent of GDP in 2007, the debt increased to 106.4 percent in 2011. Greece moved even further away from the

eurozone countries with a debt level of 107 percent in 2007 to 170 percent in 2011. With respect to the inflation rate, there was a clear movement away from the stable inflation experienced in 2000-07. There were larger fluctuations in all the countries, but in 2011 all the countries in Table 2.2 converged to 2 percent again. Greece also managed to slow down the inflation from 4.7 percent in 2010 to 3.3 percent in 2011.

An important part of a country's history within a membership in a union is its trade balance. Table 2.3, show Greece's intra-EU and extra-EU trade. These data prove that the country imports more than it exports in both markets.

Table 2. 3 Greece's share of export and import in intra- and extra-EU trade

	Intra EU-trade		Extra EU-trade	
Time	Share of Import	Share of export	Share of import	Share of export
1999	1,4	0,5	1,2	0,5
2000	1,4	0,4	1,3	0,6
2001	1,3	0,4	1,3	0,5
2002	1,0	0,4	1,6	0,5
2003	1,3	0,4	1,8	0,5
2004	1,3	0,4	1,6	0,5
2005	1,2	0,4	1,5	0,5
2006	1,2	0,4	1,6	0,5
2007	1,2	0,4	1,7	0,5
2008	1,3	0,4	1,8	0,5
2009	1,3	0,4	1,8	0,5
2010	1,0	0,4	1,5	0,5
2011	0,8	0,4	1,2	0,7
2012	No data available	No data available	1,4	0,9

Source: Eurostat

Each year since the eurozone implementation in 1999 and up until 2010, Greece's export to countries outside the EU has constituted 0.5 percent of the union's total export. The share has increased the two most recent years, but has not yet reached 1 percent. By comparison, Germany had the highest share of extra-EU trade of the eurozone countries at 27.8 percent in 2012. The share of import from extra-EU trade has since 2001 lied between 1.2 and 1.8

percent. When it comes to trade within the union, Greece's share is a bit smaller. In intra-EU trade Greece exports stands for 0.4 percent of the traded goods. This share has been the same each year since they joined the eurozone and up until 2011. Greece has imported around 1 percent of the goods traded within the EU each year since the eurozone implementation. The numbers shows the same trend as the numbers for exports to extra-EU trade, a little increase in 2007-08, but a decline in 2010-11. What seems to be clear, regardless extra- or intra-EU trade is that Greece imports approximately three times more than it exports.

It was in late 2009 that the Greek divergence from rest of the eurozone countries began creeping to the surface. A new government revealed that its predecessors had concealed enormous deficits. In November, the country's public debt was predicted to rise to 124.9 percent of GDP (€300 billion) during 2010, the highest predicted level in the EU, and double the eurozone limit on 60 percent (Euopean Commission, 2009). The Greek government also announced that its 2009 budget deficit would be equivalent to 12.7 percent of its GDP, more than four times higher than the maximum deficit allowed under the EU's Stability and Growth Pact (Ministry of Finance, 2010). Rating agencies started downgrading Greek bank and government debt.

Despite their situation, Papandreou insisted in 2009 that they would not need a bailout from eurozone states. He proposed large public spending cuts. At this point, Greece faced a critical financing problem, and in the beginning of 2010 it was clear that they needed to refinance more than €50 billion in debt during the year (BBC News, 2010). An insecurity regarding Greece's ability to pay their debt begun to spread. This made it worse for the country, which had to pay higher interest on their loans than other countries in the eurozone. This can be seen by the Maastricht bond yields, which are the convergence criterion for eurozone long-term interest rates (central government bond yields on the secondary market, gross of tax, with around 10 years' residual maturity). The yields for Greece are reported in Table 2.1, but they

are compared with the other eurozone countries and shown in Figure 2.1. The figure compares the countries in the period after the recession hit in 2007.

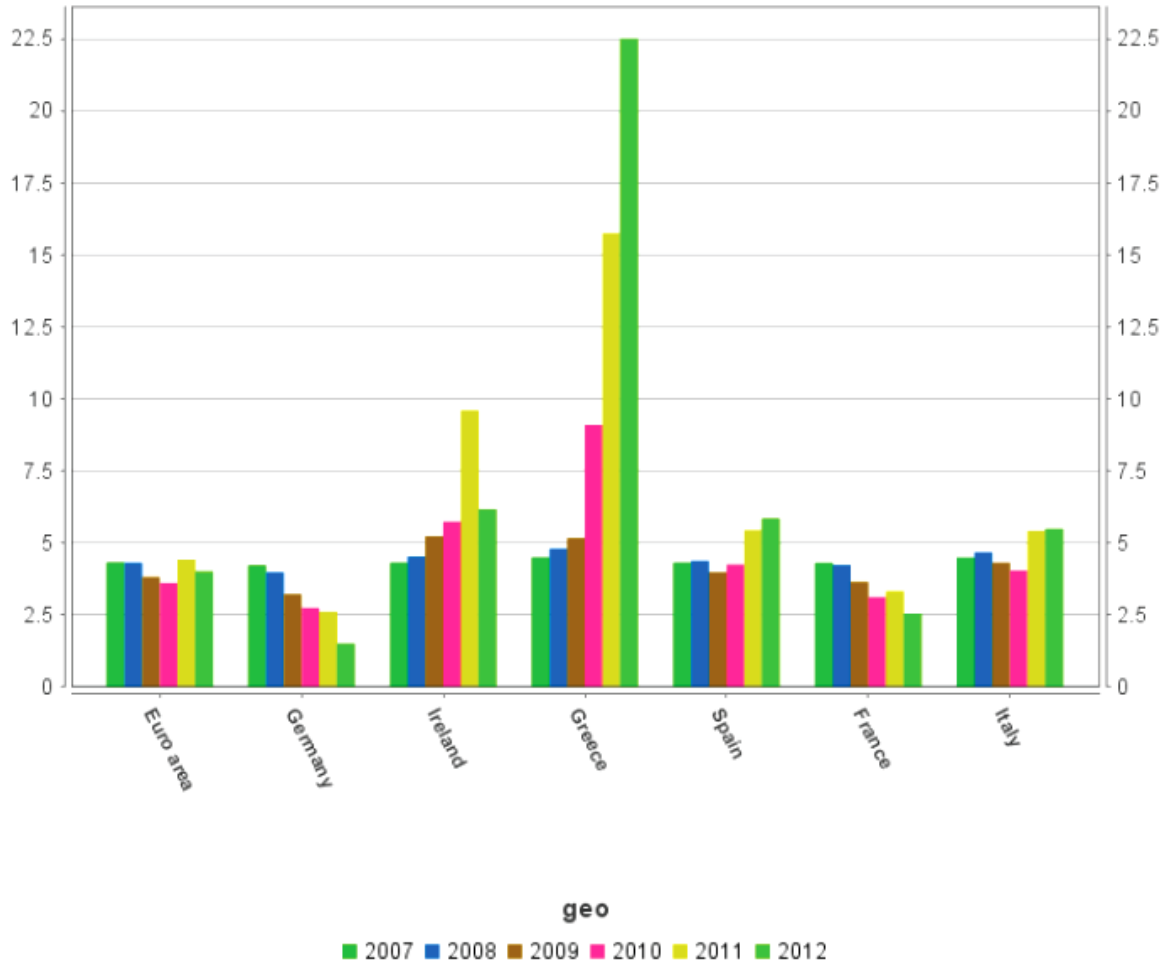

Figure 2. 1Maastricht bond yields, 2010

Source: Eurostat

The credit ratings continued to be downgraded, and in April 2010 it reached "junk-status"- below 'BBB', the lowest ratings of Standard & Poor (The Independent, 2010). In addition, Greek banks experienced capital flight. In the years from 2001 until 2010 the private capital flow in the country had been positive, but from having a private capital inflow of 12.22 percent of GDP in 2009, the banks experienced an outflow of 9.16 percent of GDP in 2010.

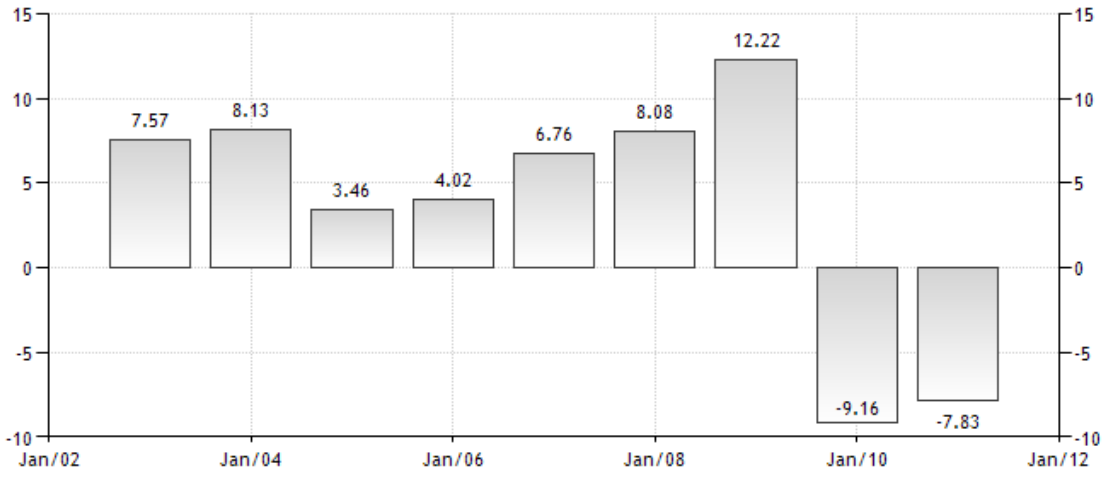

Figure 2. 2 Private capital flow in % of GDP in Greece

Source: tradingeconomics.com

Again the Greek Government wanted to cut deficit and public spending. The cuts eventually lead to a huge strike among Greek citizens, and it became clear that Greece needed help. The eurozone and the IMF agreed upon a bailout package for Greece, where they got loans with a lower interest rate than private bank loans.

With the Greek debt crisis came the fear of the other eurozone-countries with large budget deficit defaulting. The eurozone's single currency's credibility was undermined, and it weakened against the dollar to the lowest level in four years (Stephen & Daley, 2010).

The bailout package in 2010 was not enough to save Greece. They needed a new bailout in the beginning of 2012 which included a partial default on some of their debt. In they had to embark on another major austerity program with drastic spending cuts, tax rises, and labor market and pension reforms. At the end of 2012 eurozone ministers agreed to cut Greece's debt further, and extended the fiscal adjustment path by two years (BBC News, 2012).

2.3 Data showing divergence in important macro data

The bailout package devised by the European Union, the International Monetary Fund and the European Central Bank in 2010 was not given Greece for free. In return, Greece was required to cut public spending (and to privatize national assets). Cutting public spending in a country that already is in economic trouble is a risky business, since the country need economic growth rather than contractionary fiscal policy. To get a picture of how the economic recession hit Greece, it could be a good start to take a closer look at some of the country's economic indicators before and after the recession.

Greece has had a budget deficit each year since 1990. The deficit has been larger than the eurozone's average the whole period Greece has been a eurozone member. As shown in Figure 2.3 Greece's budget deficit as a percentage of GDP diverged from the eurozone's average around 1999, and before the crisis hit in 2007 the country already had an almost 6 percent larger deficit than the eurozone average. Having in mind that the budget deficit limit of being a eurozone member is 3 percent, a 6 percent difference with the eurozone average is a large gap.

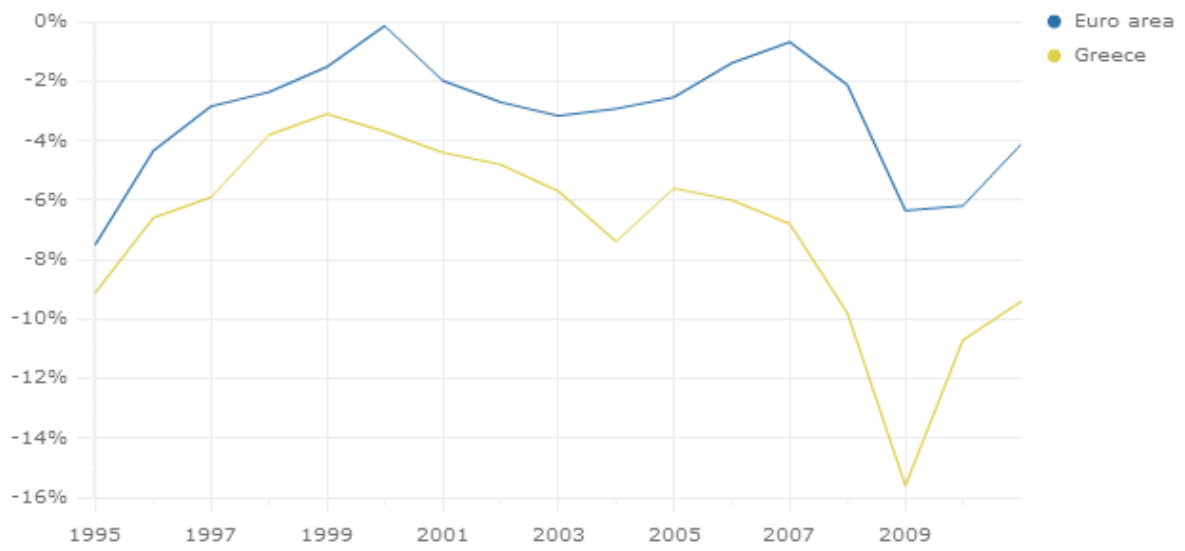

Figure 2. 3 Budget deficit in Greece compared to the eurozone

Source: European central bank, Statistical Data Base

To service their deficit, Greece took on large amounts of debt. The general government debt was 90 percent of GDP in 1990, but has been around 100 percent each year from 1992 and up until 2007. But it is not just the government who has accumulated large debts; private debt in Greece also diverged from the other countries in the eurozone. In Figure 2.4 the private debt in Greece is compared to other eurozone members. It can be seen that Greece and Spain diverged from the other countries in the period around 2003. In Greece, the private debt has increased every single year from 1995 to the recession began. The rate of increase has been high, from 37.1 % of GDP in 1995 to almost 110% in 2007. This is a clear indication of Greeks borrowing and spending beyond their means.

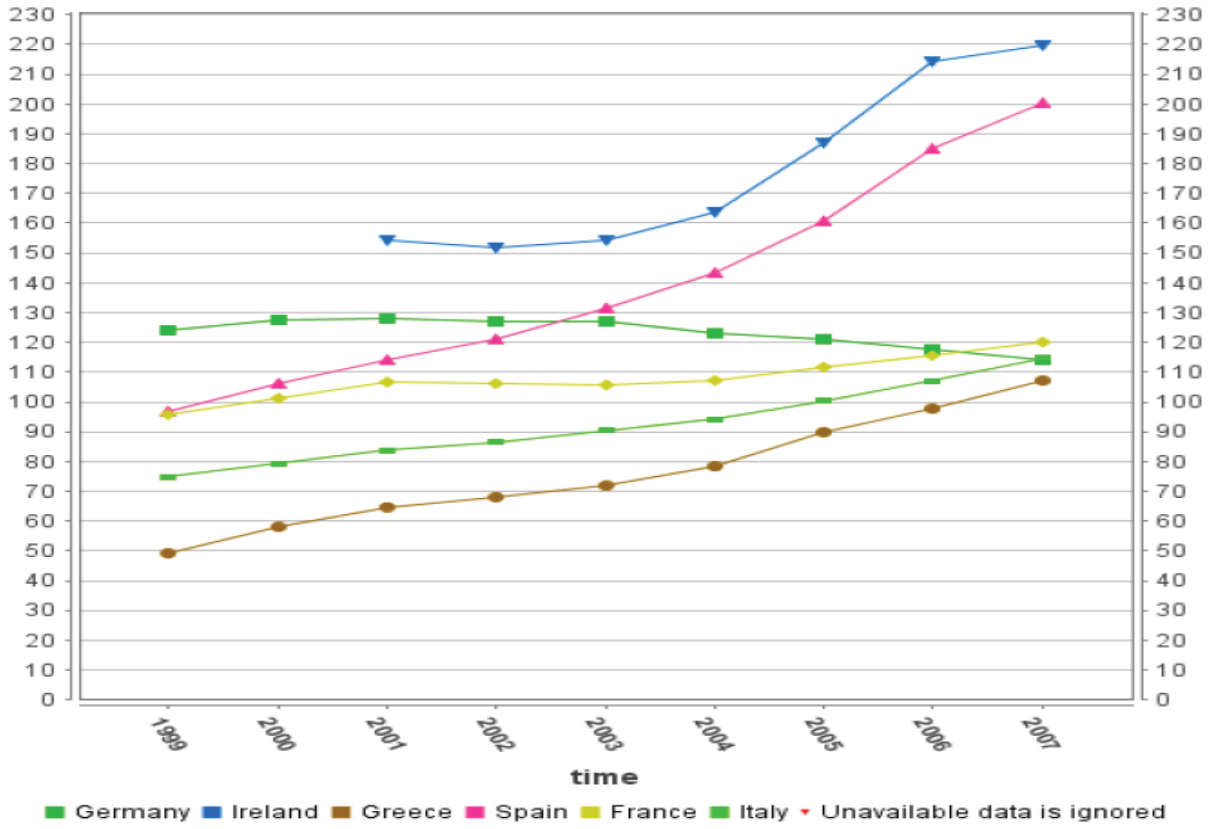

Figure 2. 4 Private debt in % of GDP in the years from the implementation of the eurozone up until the economic recession hit in 2007

Source: Eurostat

With the country's large amounts of private debt, it is interesting to look at the unemployment rate. It is a connection between the two indicators, as private companies in Greece experience the accumulation of debt as a pressure on their profitability. If they experience rough times, this will influence their employees either by putting pressure on their wages, or being forced to cut someone loose. This again means an unstable economy for Greek citizens, and they too might be forced to take on more debt. After an increase in the unemployment rate from 6.8 percent in 1990 to 9.8 percent in 1995, the rate in Greece was fairly stable around 10 % since 2001 until 2010. In Figure 2.5 it is apparent that an unemployment rate of 10% is not unique in the eurozone, but it is above the average, although the average has increased with the recession.

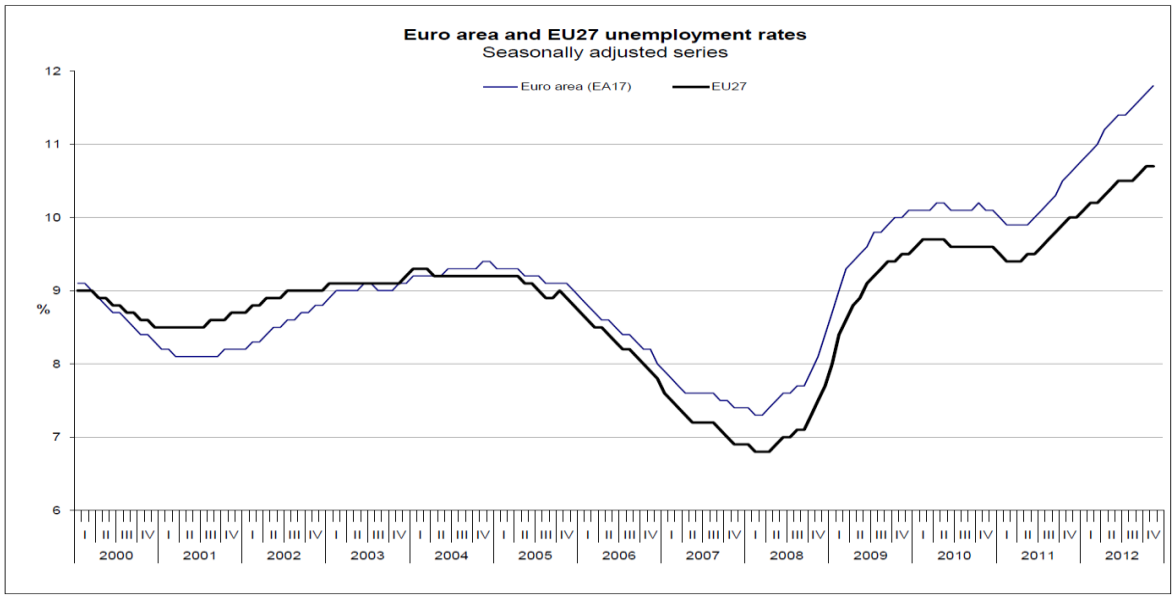

Figure 2. 5 Unemployment rate in EU and the eurozone

Source: European Commission, 2013

The macroeconomic indicators from the period before the recession suggest that Greece is above the eurozone average when it comes to debt, deficit and unemployment. With that as a starting point, one might anticipate that a recession would put more pressure on the Greek economy than the rest of the member countries. This matter will be explored in the next section.

2.4 Divergence after the crisis

The macroeconomic indicators give a picture of how the financial crisis in 2007 hit Greece's economy, and how the situation was when the fight to stay in the eurozone began. Looking at changes in the budget balance after 2007, it is clear that the deficit increased after the first year. After many years with a deficit around 5 percent of GDP, it almost doubled and grew to

around 10 percent in 2008. The next year it grew even further and landed above 15 percent of GDP. This was the largest deficit of all the countries, not just in the eurozone, but in the whole European Union in 2009. The deficit declined to approximately 10 percent in 2010, the year they received their first bailout package. There was also a further decline in the deficit the next year (European Commission, 2013).

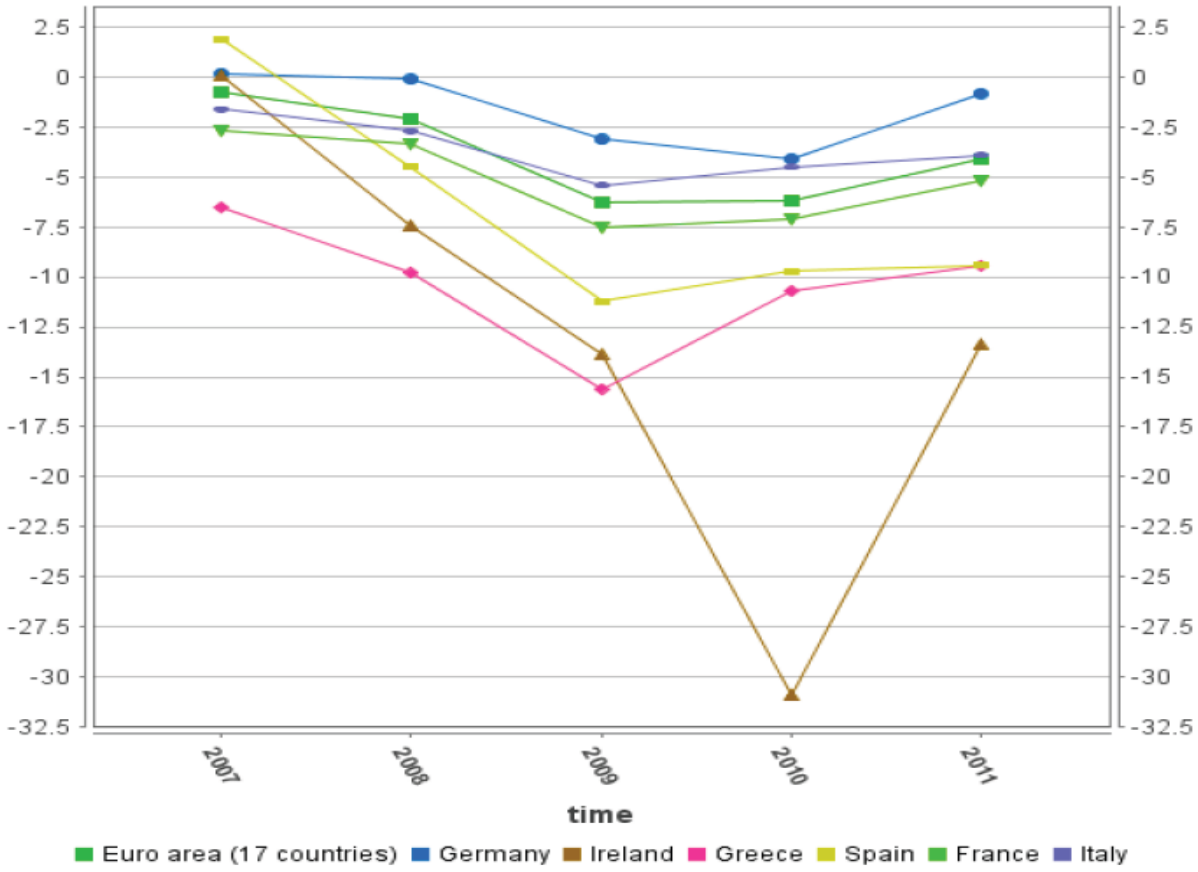

Figure 2. 6 General government deficit/surplus in % of GDP, the period 2007-11

Source: Eurostat

Greece's debt is what has gotten most attention in the recession. The government debt as percentage of GDP reflects why. As previously mentioned, the government debt in Greece

was around 100 percent of GDP each year since 1992 and until the recession hit in 2007. In 2008 the debt increased to 113 percent before it accelerated in 2009 to 130 percent. By 2012 it exceeded 170 percent. These last three years, Greece had the highest level of government gross debt in the whole European Union, by a large margin. In comparison, Italy had the second largest level, its debt as a percentage of GDP reaching 120 percent in 2011. It is also interesting to compare the debt and deficit level in Greece and Ireland. Figure 2.7 shows that Ireland had approximately the same amount general government debt as Greece in 2007 and 2008, but the countries diverged, and in 2011 there was a gap of 50 percent between them. Meanwhile, the deficit level in Greece and Ireland represents a development in the other direction in this period. In Figure 2.6 it is demonstrated that after Greece got their first bailout package in May 2010 they managed to decrease their deficit, while Ireland experienced a large increase from around 15 percent of GDP to 30 percent the same year. However, in November 2010 Ireland received a bailout package as well, and in 2011 their deficit was reduced to 15 percent of GDP again (European Commission, 2013).

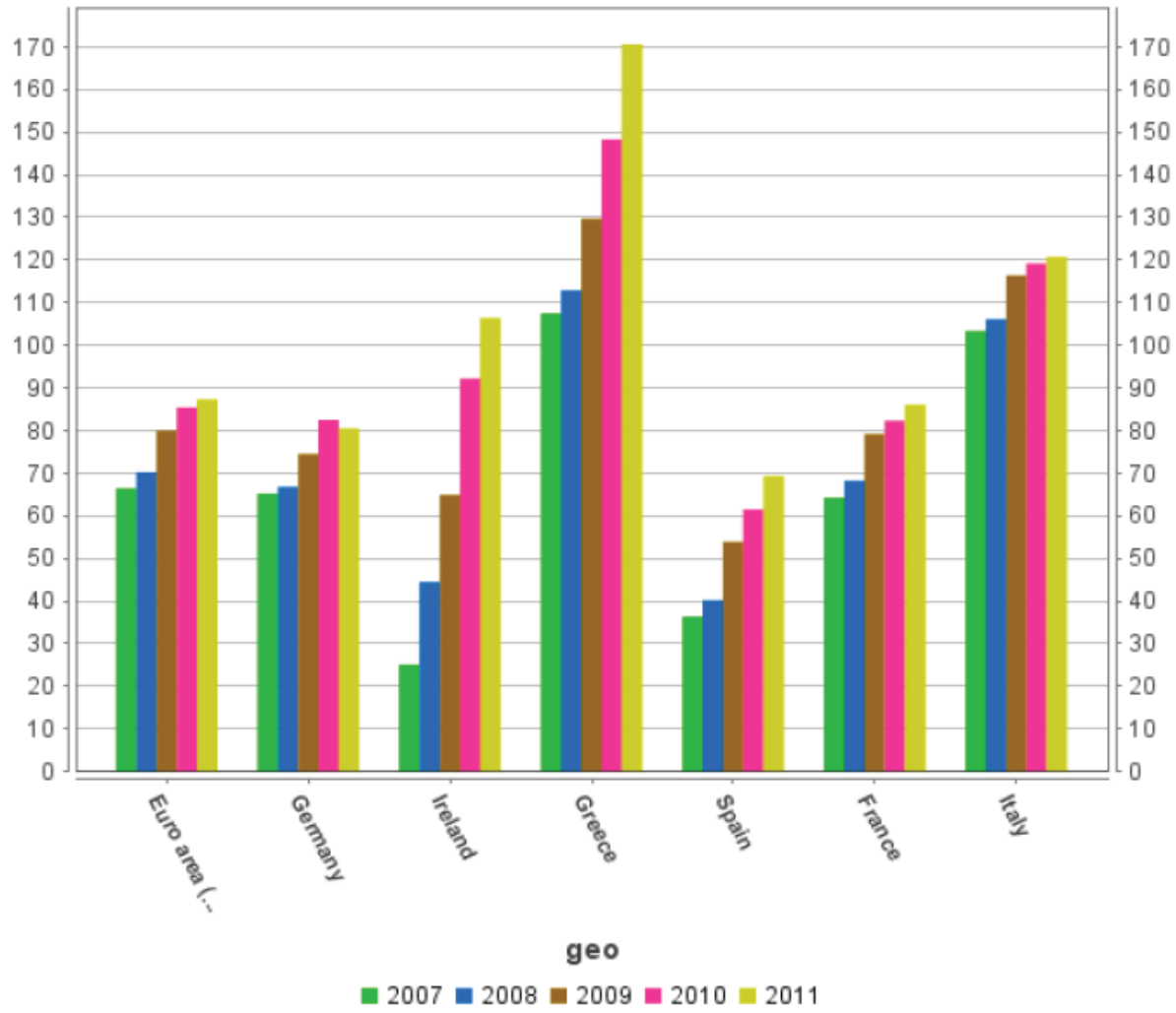

Figure 2. 7 General government gross debt in % of GDP, in the period 2007-11

Source: Eurostat

When it comes to paying their accelerating debt, the development of the interest rate is important. When the extent of Greece's debt problem was revealed in late 2009, the market responded by sending interest rates up. After the bailout packages for Greece were put together, the hope was that investors would be calmed. But in the fall of 2010 interest rates began creeping up again, as countries that reduced their spending to meet tough deficit targets found themselves falling further behind, as their economies slowed and revenue intake

declined. An example is the Maastricht bond yield, which is the central government bond yield in the secondary market, previously reported in Table 2.1, and shown graphically in Figure 2.1. In 2008 this was 4.80 percent and 5.17 in 2009. The next three years the yield had exceptional large increases (to 9.1, 15.8 and 22.5 respectively), and the levels in Greece diverged from the rest of the eurozone (European Commission, 2013).

When it comes to the unemployment rate in Greece, it can be seen that after having a quite stable rate around 10 percent, and a small decline the latest years up until the recession, unemployment increased after 2007. When the austerity measures were implemented in 2010 the increase in unemployment went from 12.5 percent to 17.7 percent in 2011, the second highest rate in the European Union, only surpassed by Spain.

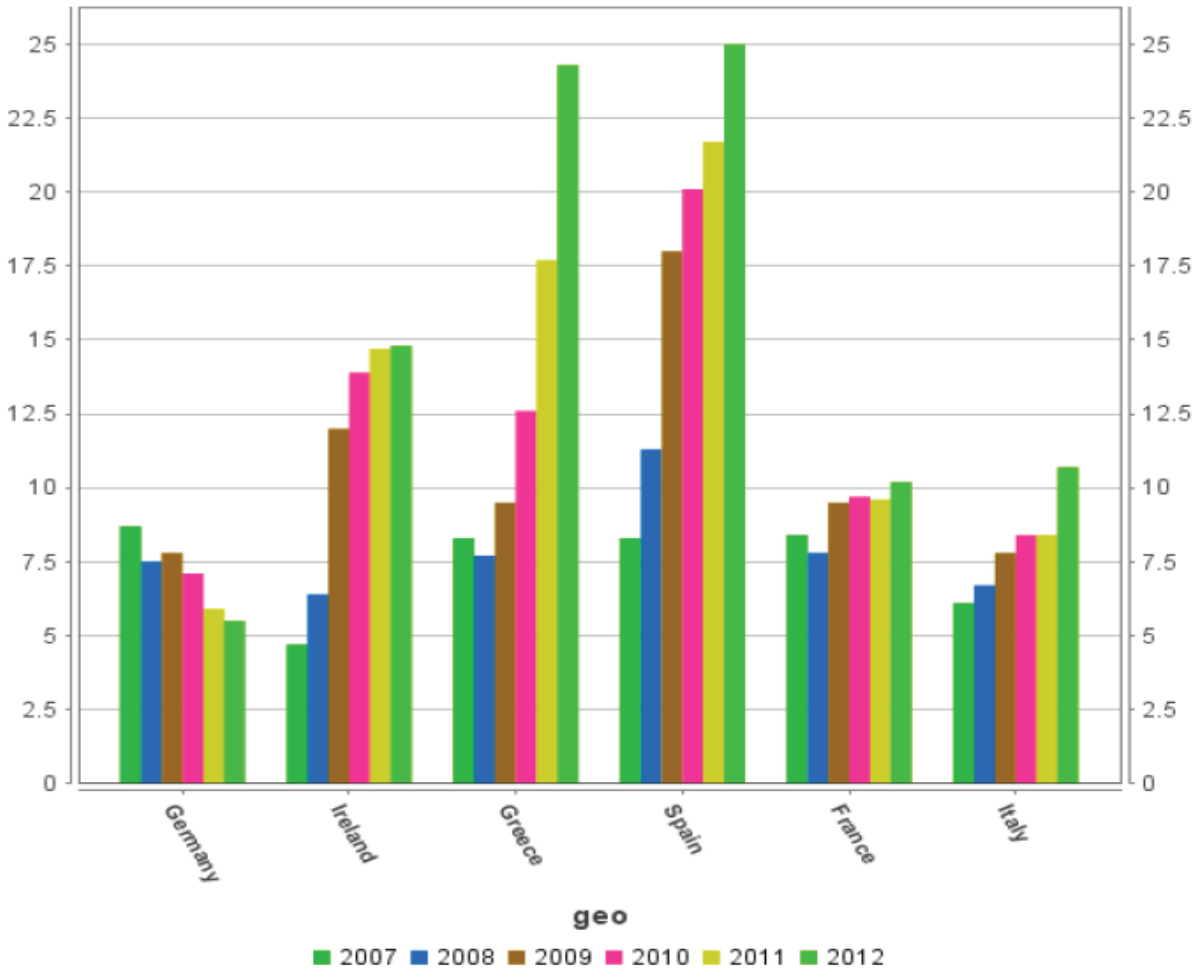

Figure 2. 8 Unemployment rate, annual data, 2007-11

Source: Eurostat

Figure 2.8 shows the countries' annual average rate, and it points out that Spain still had the highest average unemployment rate in 2012. However, the unemployment rate in Greece rose to 26.8 percent in October 2012, and thereby overtook Spain as the country with the highest unemployment rate in Europe.

In addition to the high unemployment, Greek has a history of undeclared work. A report from the inspectors of the special agency of insurance control of the country's Social Insurances Foundation (IKA) revealed that undeclared work rose to 36 percent in Greece in 2012 (phantis, 2013). With undeclared work constituting a third of the Greek economy, the government loses large amounts of tax revenues. In the media, the Greeks have announced they do not have any confidence in the government, and that they do not see the point of paying taxes.

2.5 Summary

The history of Greece shows traditions of large public spending. This has resulted in public deficits and accumulation of debt. When the country got included to the eurozone in 2001 they experienced a relative stable economy in the period from 2000-07, but they also stood out with weaker macroeconomic indicators than the other countries. After the recession stroke in 2007, data presented in this chapter shows divergence in macroeconomic data in Greece compared to other eurozone countries. The data tell that there were large asymmetries in the effects of the recession. Greece's share of export and import in intra- and extra- EU trade has shown that the country cannot be said to be a big trader, and that their share of import is approximately three times larger than their export. The data on private capital out- and inflow can give a picture of the effects insecurity can have in the market. The data will be used in the

framework that will be established to analyze whether Greece should stay or leave the eurozone in chapter 4, and in the discussion in chapter 5.

Chapter 3 Theory

3.1 Monetary union: an extreme form of fixed exchange rate

A monetary union is a union between countries that use the same currency which is managed by one common central bank. When a country joins a monetary union the national central bank either ceases to exist or will have no real power. The country no longer has the ability to determine the quantity of the national money in circulation, or to change the short term interest rate (Grauwe, 2009).

There are many designs of a monetary union. In the strict term a monetary union means complete abandonment of separate national currencies and full centralization of monetary authority in a single joint institution. But in reality there are many variations along two key dimensions; 1) institutional provisions for the issuing of currency and 2) institutional provisions for the management of decisions. In political terms a monetary union can be divided into two groups, a shared monetary sovereignty or surrendered monetary sovereignty to a supranational institution (Economic History Association, 2010).

The theory of monetary union is largely congruent with fixed exchange regimes. A monetary union is an extreme version of fixed exchange rate, but there are at least two distinctions. First, because the countries switch to a new currency, the cost of abandoning the new system is much higher than for a typical fixed exchange rate regime, giving people more confidence that the system will last. Also, a monetary union eliminates the transactions costs people incur when they need to exchange currencies in carrying out international transactions. Meanwhile, both under a monetary union and a fixed exchange regime, the ability to use the exchange rate as a policy tool is lost. With a fixed exchange regime the country instead have to use their policy tools to keep their exchange fixed to the anchor country. There are mainly three theories about exchange rate determination; 1) purchasing power parity (PPP) links spot

exchange rates to nations' price level; 2) the interest rate parity (IRP) links spot exchange rates, forward exchange rates and nominal interest rates; and 3) the international Fischer effect (IFE) links exchange rates to nation's nominal interest rate level. The PPP states that the spot rate of one currency with respect to another will change in reaction to the differential in inflation rates between the two countries. Consequently, the purchasing power for consumers when purchasing goods in their own country will be similar to their purchasing power when importing goods from the foreign country. IRP means the forward rate of one currency with respect to another will contain a premium (or discount) that is determined by the differential in interest rates between the two countries. As a result, covered interest arbitrage will provide a return that is no higher than a domestic return. The IFE involves that the spot rate of one currency with respect to another will change in accordance with the differential in interest rates between the two countries. Consequently, the return on uncovered foreign money market securities will, on an average, be no higher than the return on domestic money market securities from the perspective of investors in the home country. These parity theories are more likely to hold under a single currency than other currency regimes, because of higher flexibility in labor and capital markets. This will be further discussed under the theory of optimal currency areas (Steigum, 2004).

The macroeconomic objective of a fixed exchange regime is naturally stability in the exchange rate. But there are also objectives related to domestic macroeconomic balances, such as stability in external balance (X-M = 0 or is stable), price stability or low inflation, stable money supply growth, stable interest rates and prevention of asset price bubbles. Under a fixed exchange regime a country surrenders its fiscal policy in the sense that the government cannot independently use public spending to pursue objectives other than to help keep the exchange rate at its targeted rate. Consider a fix to a single currency where E is the exchange rate, P_H and P_F is the home and foreign country price respectively, while i_H and i_F is the home

and foreign country's interest rate. Then $E_{LC/FC} = P_H / P_F$ and $i_H = i_F$. This means public spending cannot be used such that it creates interest rate differentials, but can only be used as a means to ensure that domestic price changes over time are kept in synch with foreign price changes. Under a strict fix, also the monetary policy is affected. The monetary policy is no longer independent with respect to the rate of money supply growth. The growth rate is set to maintain $E = P_H / P_F$ and $i_H = i_F$ rather than for some other domestic policy objective. Hence, the foreign country's inflation rate and interest rates are imported and changes in money supply are made to that end. So, if the anchor country has a bout of price instability, then home's central bank must allow the price instability to keep the local currency fixed. Using money supply to maintain employment and output may also be affected. If interest rates in the anchor country increase and raise the value of the local currency, then so must it in the home country. Higher value of the local currency means more import and less export. While these conditions may make sense for the anchor country, it may be that a worsening balance of trade in the home country only makes a recession worse, and money supply cannot be used to expand the economy. Under the strictest fixes where reserves back the local currency, the central bank will be unable to act as lender of last resort to bail out banks. Either this role falls to the government, which might be constrained because of a debt problem, or it falls to the IMF (Garcia, 2012).

Setting the system-wide level of money stock and the interest rate is a problem in every system of fixed exchange rates. Grauwe (2009) calls this a "*n*-1"- problem. In a system of *n* countries, there are only *n*-1 independent exchange rates. Hence, *n*-1 monetary authorities will be forced to adjust their monetary policy instrument so as to maintain a fixed exchange rate. One monetary authority will be free to set its monetary policy independently. To set the system of level of money stock and interest rate there needs to either be an asymmetric

solution, or a symmetric solution. The first solution consists of allowing one country to take a leadership role. The country fixes its money stock independently, which then fixes the interest rate in the country at one level. The other countries now have no choice but to follow these levels. The second solution consists of the countries deciding jointly about the level of their money stock and interest rates. Thus, this is a solution that requires cooperation.

3.2 Costs/benefits of a monetary union

The benefits of a monetary union membership are mainly tied to advantages from intra-union trade. The costs derive from the fact that when a country relinquishes its national currency, it also relinquishes an instrument of economic policy, i.e. it loses the ability to conduct a national monetary policy and the use of the exchange rate vis-à-vis other member states of the monetary union. There are many situations where use of independent monetary policy is useful, because nations are different in some important senses. These differences can lead to imbalances, which in a monetary union need to be adjusted without using monetary policy. In which grade the countries have the ability to make adjustments depends on different characteristics. The analysis of these characteristics is known as the theory of optimum currency area.

3.2.1 Optimal currency area theory

An optimum currency area is an area that has fixed exchange rates with countries in the area, but flexible exchange rates with trading partners outside the area, because this is optimal for balance-of-payments adjustment as well as for the effectiveness of domestic macroeconomic policy. This means there will be no flexibility in the exchange rates vis-à-vis members of the monetary union, hence, no transaction cost related to the exchange rate. However, with fixed exchange rates there is no possibility to allow the currency to float against the anchor

currency. One result is that there is no opportunity of using devaluation as a policy tool to improve BOP (balance-of-payments). Consider a situation where a country has a BOT (balance-of-trade) deficit, where

BOP=BOT – net capital (K) account position– change in international reserves (R) (1)

A BOT deficit has to be offset with net K-outflows and/or a negative change in R. Without the use of R, then K-outflows should decrease the value of local currency, or ↑ $E_{lc/fc}$. This should then make exports cheaper in fc terms and imports more expensive in lc terms. An increase in the BOT, ↑ (X-M), should reduce the BOT deficit until BOT = 0. For an area to be an optimum currency area this involves member countries fulfilling some characteristics which makes them independent of using the exchange rate as a tool to stabilize the BOP[1].

Mundell (1961) and McKinnon (1969) analyzed these necessary characteristics of an optimum currency area. There are mainly four conditions that need to be fulfilled: 1) No barriers to trade of goods and services; 2) mobility and flexibility in factor markets (labor and capital, which in effects supports purchasing power parity and interest parity); 3) mechanisms that promote fiscal stabilization; and 4) symmetrical response to supply and demand shocks. Point one is basically saying that to promote more trade, trade restrictions between countries must be eliminated and there needs to be a common trade policy with respect to other countries. In addition, there must be similar domestic regulations that otherwise can substitute for trade policy. Greater mobility of factors will cause convergence in interest rates for capital and wage rates for labor. Labor mobility will improve competition, which is also necessary to avoid industry structure issues that prevent foreign competition. More labor mobility includes

[1] E=Exchange rate, lc=local currency, fc=foreign currency, X=export, M=import

lack of cultural barriers to free movement, such as different languages, and institutional arrangements, such as the ability to have company pension plans transferred throughout the region. 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. Capital mobility means price and wage flexibility across the region. Flexibility needs to be present so that the market forces of supply and demand automatically distribute money and goods to where they are needed. Flexible wages and prices are necessary for a country to adjust the economy in response to external shocks because the exchange rate or interest rate cannot be used. Fiscal stabilization represents a risk sharing system such as an automatic fiscal transfer mechanism to redistribute money to areas or sectors that have been adversely affected by the first two characteristics. When it comes to the symmetries in the effects from external shocks within the area this means that member countries should respond similarly to shocks and not diverge in macroeconomic indicators. The European Commission's view is that more integration leads to more symmetric effects of shocks and also more symmetry in shocks. According to this view, it can be concluded that more openness reduces the cost of a monetary union, as it reduces the possibility of asymmetric shocks and increases the symmetry in adjustments to external shocks. Symmetric shocks allow the shared central bank to promote growth in downturns and to contain inflation in booms. Should countries in a monetary union have idiosyncratic business cycles, then optimal monetary policy may diverge and union participants may be made worse off under a joint central bank. Consider a case where a member country experiences a downturn in the economy because of a shock in oil-prices. Meanwhile, another member country is an oil-rich country that experiences the price shock in the other direction. If the central bank then chooses to help the country that experience the downturn and promote growth, the oil-rich country would be affected of the growth

promotion too. This means that the oil-rich country is in danger of obtaining inflation (Mundell, 1961).

Mundell focused on the degree of factor mobility and the economic structure between countries. In his point of view, it is a problem if the flexible exchange rate pertains to the national political units, while fixed rates exist between regions that are economically dissimilar and have little factor mobility between them. A fixed rate between these regions would be trouble since there could be regions that experience an economic downturn while other an upturn and neither of them would be able to use the exchange rate nor move labor or capital to adjust to the economic movements. In a situation like this, it would beneficial if the economic units adopted a fixed exchange rate, while the regions that are economically dissimilar have flexible rates. An important point here is that the theory does not provide any guidance on what constitutes a proper exchange regime, but that there is a role to play for both types of rates dependent on how the regions involved are similar or dissimilar. Countries that have similar economic structure and factor mobility between them should have fixed exchange rates among themselves, because they comprise an optimum currency area. At the same time, they should adopt flexible exchange rates relative to the rest of the world (Appleyard, Field jr, & Cobb, 2010).

Mundell (1961) gives an example of a two-country case of Germany and France where an asymmetric shock of shift in demand occurs. If the two countries were not members of a monetary union, they would have been free to use their national monetary policy tools to adjust to the asymmetric shock. Suppose they had chosen a flexible exchange rate regime. Then France could have stimulated the aggregate demand by lowering its interest rate, while Germany could have reduced the aggregate demand by doing the opposite. The French franc would most likely depreciate, the German mark appreciate, thereby making French products

sold in Germany cheaper. Aggregate demand in France would boost, and aggregate demand in Germany would decrease (Grauwe, 2009).

In Mundell's situation however, they form a monetary union. He assumes they have abandoned their national currency and use a common currency, the euro, which is managed by a common central bank, the ECB. The adjustments have to be made without using the exchange rate as a tool. In the case, consumers shift their preferences away from products made in France to products made in Germany. This is shown in the figure below.

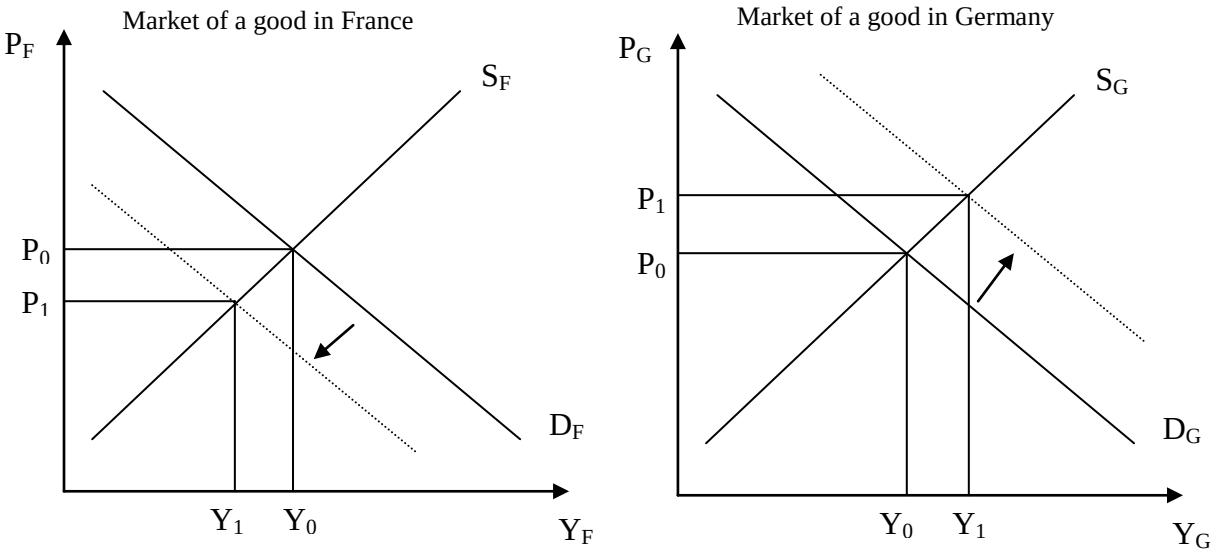

Figure 3. 1 Aggregate demand and supply in France and Germany

The curves in the Figure 3.1 are standard aggregate demand and supply curves in an open economy. Thus, the demand curve is negatively sloped because when domestic price for a good increases the demand for the domestic output declines. The supply curves are positively sloped as domestic firms will increase their supply when the price of the domestic good increases. These curves are drawn under the assumption that the nominal wage rate and the price of other inputs remain constant. If prices of these inputs changes, the supply curve will shift. In this case, a permanent shift in demand is depicted. When demand for the goods made in Germany increases, the demand curve shifts upward, while the opposite happens in France

where demand for the goods decreases. In Germany, price and output increase from P_0 to P_1 and from Y_0 to Y_1. France will have the reverse effects, with lower price and decrease in output. Since output increases in Germany, the country will most likely need more employees, hence, experience an increase in employment, while France most likely will experience additional unemployment. Both countries will have an adjustment problem. Reduced output and higher unemployment will plague France, while Germany will experience upward pressure on its price level. Trade flow between the countries is one mechanism that will restore equilibrium. For Germany, the excess demand for labor puts an upward pressure on the wage rate, and the supply curve will shift upward. The adjustment to the disequilibrium must now come exclusively through price increases in Germany, resulting in German goods being less competitive than French goods. The aggregate demand curve in France will shift upward, while Germany experiences inflation. Cross-border trade between the two countries, where goods should be exported from France to Germany, would be the means of restoring equilibrium. This is consistent with the law of one price, PPP.

If trade flow cannot bring the macroeconomic into equilibrium there are two other mechanisms that will automatically solve the problem. Wage flexibility and mobility of labor (Grauwe, 2009). If wages are flexible in France and Germany, French workers who are unemployed will reduce their wage claims, while the excess demand for labor in Germany will push up the wage rate. The adjustment mechanism is shown in Figure 3.2.

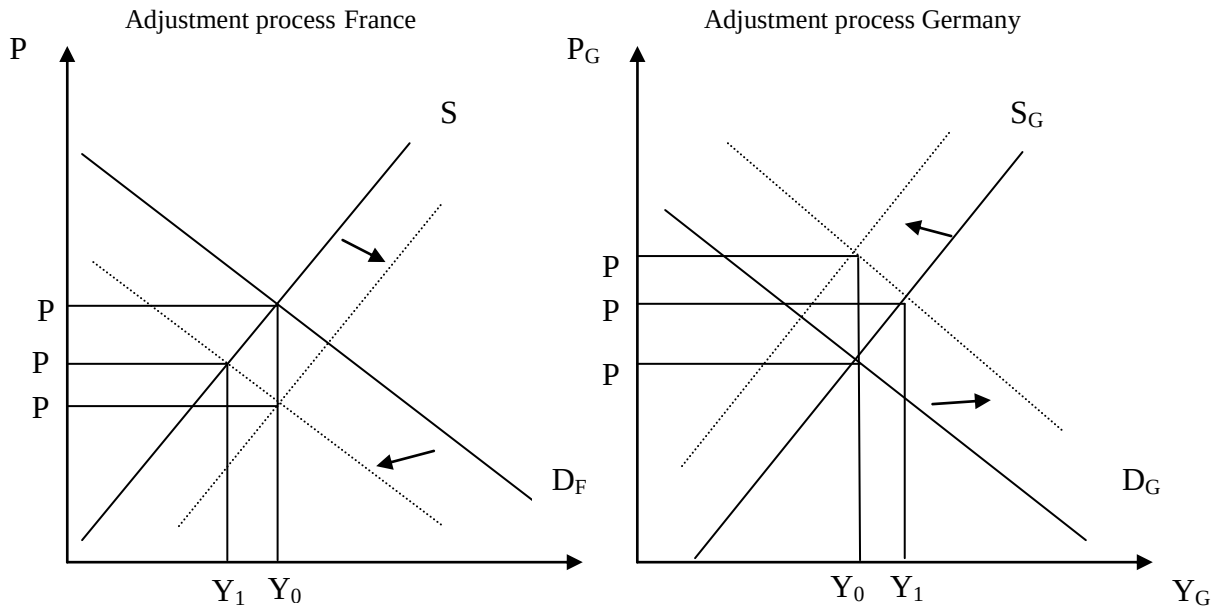

Figure 3. 2 The automatic adjustment process

The reduction of the wage rate in France shifts the aggregate supply curve downwards, while the wage increases in Germany shifts their aggregate supply curve upwards. These shifts results in new equilibriums in both countries. In France the output goes back to the original level at Y_0 while the price declines even further. Germany adjusts with higher price (from P_1 to P_2), but as in France, the output shifts back to Y_0.

The second mechanism involves mobility of labor. If mobility of labor exists, French unemployed workers move to Germany where there is excess demand for labor. When this happens, the need to let wages decline in France and increase in Germany will be eliminated.

Thus, if wages are flexible, and/or if the mobility of labor between the two countries is sufficiently high, the adjustment problem will disappear. But if these conditions are not satisfied, the problem will not vanish. Consider a situation where wages in France do not decline despite higher unemployment, and that the country's workers do not move to Germany. France will be stuck in the disequilibrium situation depicted in figure 3.1 (Grauwe, 2009).

In cases where labor, capital markets and trade flows cannot bring the macroeconomics into equilibrium, the problem might be solved with fiscal policy through taxes and subsidies as shown in Figure 3.3.

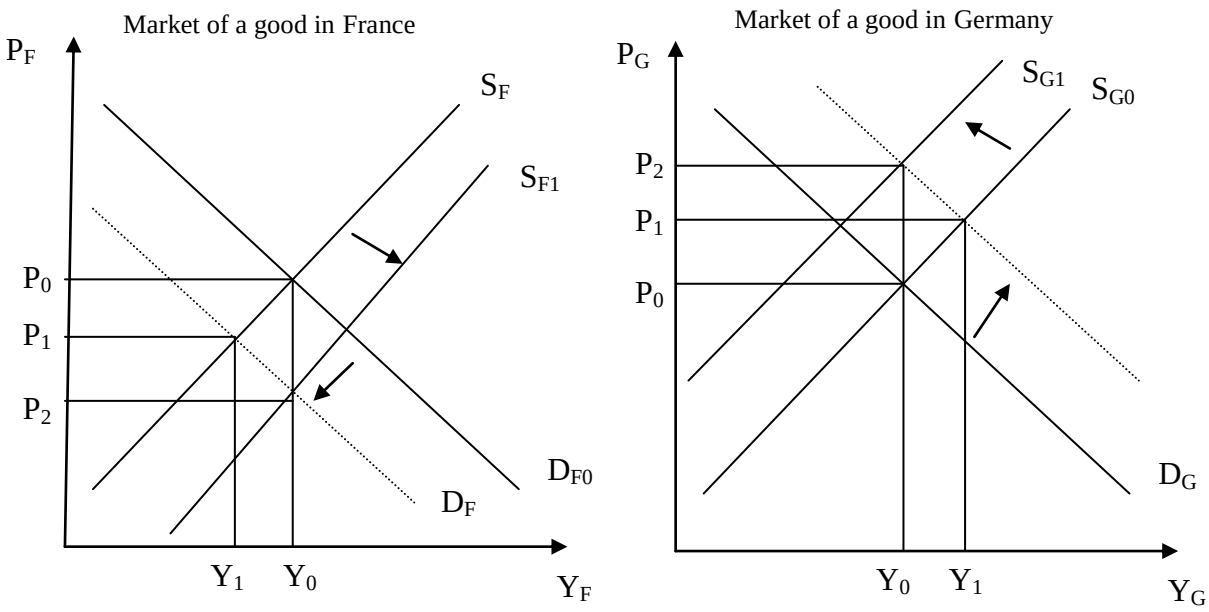

Figure 3.3 The use of fiscal policy to restore equilibrium

Initially, France and Germany are at domestic equilibriums, i.e. $P_0 = Y_0$. When the countries experience an asymmetric shock, the government could introduce a subsidy to the producers in France who experience a decrease in demand. The subsidy will give the producers an opportunity to offer their goods at a lower price, but still earn the same revenue. The supply curve shifts, and the equilibrium will be restored at the original output level Y_0 at a lower price P_2. In Germany the opposite has to be done. By introducing a tax to the producers who experience an increase in demand, the producers will increase their price since they have to pay tax, but do not want to earn less revenue. The supply curve shifts upwards. Equilibrium will be restored at the original output level Y_0, but at a higher price P_2. For this to occur, the subsidy must equal

$$S_F = (P_0 - P_2) * Y_0, \quad (2)$$

while the tax in Germany must equal

$$T_G=(P_2-P_0)*Y_0. \quad (3)$$

However, in a monetary union the fiscal policy tools cannot be used freely. An increase in public spending will lead to an increase in aggregate demand and in interest rates. The interest rate in the home country must equal the foreign interest rate (interest rate parity), which implies that also the fiscal policy is affected by the fixed exchange rate.

There is also a fiscal mechanism tied to the degree of political centralization that might help when asymmetric shocks or asymmetries in effects of external shocks occur. This could affect the optimality of a monetary union in several ways. A political union makes it possible to centralize a significant part of national budgets at the level of the union, which makes it possible to organize systems of automatic fiscal transfers that provide some insurance against asymmetric shocks. Such a mechanism would ensure that countries hit by a negative shock are compensated by transfers raised in the countries experiencing a positive shock. Paul De Grauwe (2009) states this as an insurance system. He splits the system in two ways, a centralized and a decentralized budget. A centralized union budget could transfers income from member states that experience good economic conditions to member states experiencing a negative shock. In the centralized system the transfers happen automatically. Suppose that a large part of the government budgets of France and Germany is centralized at the European level. This means that it exist a European government that directly levies taxes and directly transfers revenues to residents in France and Germany. As a result, a decline in output in France leads to a reduction in the tax revenues of the European government from France, while the tax revenues from Germany increase as a result to an increase in the country's output. At the same time, the European government increases its spending (unemployment benefits) in France and reduces these in Germany. The net result of this is that the central

budget automatically redistributes income from Germany where output has increased, to France where output has decreased. As a result, French and German citizens can stabilize their consumption over time despite asymmetric shocks in output or asymmetries in the effects of external shocks. The main problem of such a system is that it can lead to the problem of moral hazard. Examples of this can be seen within countries where there are fiscal mechanisms between regions. In Belgium, Germany and Italy the national budget automatically transfers income from regions with high output growth to regions with low input growth. These transfers tend to reduce the pressure and incentives to adjust to asymmetric shocks, thereby giving a permanent character to budgetary transfers. In a decentralized system, the transfers constitute debt that is supposed to be paid back. The country experiencing a negative shock will increase its external debt to the country experiencing a positive shock. This is no longer a regional insurance system, since those who receive transfer during hardship are supposed to pay back the other country later. In the Germany – France case, it is the people in France that needs to make these future payments. In addition, this decentralized system will reduce the degrees of freedom of future French fiscal policies. This contrasts with the case where the national budgets are centralized. In such a system, the country that receives transfers will not have to face such external debt problems, as the transfer happens automatically. If the union in addition became a completely political union the risk of asymmetries of political origin would be reduced. An example is decisions concerning income and taxation. If these decisions are made in the hands of national governments and parliaments, they can create asymmetric shocks. The same goes for decisions concerning social security and wage policies (Grauwe, 2009).

The main point is, a monetary union between countries with rigid wages and limited labor mobility, will find it harder to adjust to asymmetries in the economy than countries that have maintained their own national money and that can devalue (revalue) their currency. In

addition, the use of wages and prices as tools to regain competitiveness, instead of using national monetary policy or the exchange rates as an instrument, could also be painful for a country. To the extent that these alternative policies are more painful than allowing for exchange rate changes, it can be concluded that the country under consideration does not gain from relinquishing its money and joining a monetary union (Grauwe, 2009).

Mundell (1997) extended his work and distinguished between a "true" currency area and a "pseudo" currency area with respect to their adjustments mechanisms. Under a true currency area a monetary system contains an automatic adjustment mechanism. In peaceful times this mechanism, coupled with a commitment to stability, is virtually absolute. In a pseudo currency area the countries have a certain degree of autonomy with regards to changes in parities. There is no automatic adjustment mechanism in a pseudo currency area. Hence, interest rates can diverge in response to expected changes in exchange rates, and destabilizing speculation can occur. The currency areas in modern history are in Mundell's opinion different types of pseudo areas. He believes that the countries involved in these areas needs to have sufficiently similar political and/or economic interests and a willingness to adapt when the situation demands it, to be successful. If the countries involved do not have such a political commitment, they will not achieve the expected benefits of membership in the currency area (Appleyard, Field, & Cobb, 2010).

Another side of being a monetary union member is the possibility of costs connected to the fact that countries can differ because of different preferences. An example is their tolerance to the rate of inflation. Consider a two-country case, where country B prefers a lower rate of inflation than country A. If country A has a higher inflation rate than country B, it will have to depreciate its currency to maintain the competitiveness of its products. If the two countries form a monetary union, the exchange rate is fixed, so that the inflation rate must be equal. If this is not the case, country A will lose competitiveness because of its higher prices. The cost

of a monetary union for the two countries now rests in the fact that if they want to keep the exchange rate fixed, they will have to choose another, less preferred, inflation rate (Grauwe, 2009).

When a country gives up their own currency there can also be some problems connected to growth rates. Some countries grow faster than others. Again the two-country case illustrates the problem. Suppose country A's GDP is growing at 5 percent per year, country B's GDP at 3 percent per year. Suppose that the income elasticity of import of both countries is equal and has a value of one. Then country A's import from B will grow at 5 percent per year, whereas B's imports from A will grow at only 3 percent per year. This will lead to a trade balance problem for the fast-growing country A, whose imports tend to grow faster than its exports. In order to avoid chronic deficits in its trade account, country A will have to reduce the price of its exports to country B, so that the latter country increases its purchase of goods from country A. In other words, country A's terms of trade must decline as to make its product more competitive. This can be solved by either a depreciation of country A's currency or a lower rate of domestic price increases than in country B. If the two countries form a monetary union, only the second option will be available. This will require country A to follow relatively deflationary monetary and/or fiscal policies, which in turn will constrain the growth process. Thus, a monetary union has a cost for the fast-growing country, which will find it more advantageous to keep its national currency.

While many of the costs attached to a monetary union have much to do with the macroeconomic management of the economy as a result of fixing the currency, many of the benefits are at the microeconomic level. The gains are expected to be related to improved efficiency, as transaction costs associated with the exchange of national moneys and the risk coming from uncertain future movements of the exchange rates are eliminated. The EC Commission has estimated economic gains from the elimination of transactions costs in the

eurozone to between 13 and 20 billion euro a year. However, Grauwe (2009) notes that these gains have a counterpart somewhere, mostly in the banking sector. Surveys have indicated that about 5 percent of the banking sectors revenues are commissions paid in currency exchanges. This revenue vanishes with a monetary union. Uncertainty about future exchange rate changes means uncertainty about future revenues of firms. This leads to loss of welfare in a world populated by risk-averse individuals. Thus, reducing this risk increases welfare (EC Commission, 1990)

Another gain is on a more indirect level. When countries share the same currency, there is more price transparency. Consumers who see prices in the same currency unit are better able to make price comparisons, and to shop around. This improves the competition, and all consumers will face the same lower prices. However, an analysis of the average price of a basket of 160 identical brand name products in the eurozone in 2005 showed a price differential of 30 percent between the cheapest and most expensive country. Part of the difference is related different regulations, customs, languages and cultures (Grauwe, 2009).

It can be argued that a liquidity crisis inherent in a banking crisis can more easily be dealt with in small open economies that are part of a monetary union than in countries that stand alone. After the eruption of the financial crisis in August 2007 it was not members of a monetary union that experienced most problems dealing with the liquidity crisis. This is because when a banking crisis erupts, banks face a liquidity problem and deposit holders withdraw their deposits. To avoid having to sell their assets at low prices, banks turn to the central bank to obtain liquidity. But many of the banks in the small open economies outside a monetary union had accumulated large amounts of deposits in foreign currency to be invested in long-term foreign currency assets. The domestic central bank could thereby not function as the lender of last resort, because it could not create the foreign currency liquidity needed to help domestic banks to face deposits withdrawals. This situation did not happen with banks in

countries part of the eurozone. Most of the short-term funding of the banks in these countries was in euro, and banks could easily obtain the liquidity from the ECB. However, the fact that monetary union makes crisis management easier does not mean that it helps countries better to manage the adjustment process once the banking crisis is resolved. Banking crisis tends to end in a recession, and countries in a monetary union may find it more difficult to lift themselves out of a recession than countries that stands alone because they cannot follow policies aimed at depreciating the currency to boost aggregate demand (Grauwe, 2009).

3.3 Fragility of an incomplete monetary union

There are many monetary arrangements between nations that are far removed from a full monetary union, and yet also follow rules that constrain the national monetary policies of the participants. These are arrangements whereby the monetary authorities peg their exchange rates. “Pegging” is a means of stabilizing a nation’s currency by fixing its exchange rate to that of another currency. The concept of pegging to a single currency becomes more attractive if the peg is to the currency of a trading partner. Usually a pegged exchange rate will have some sort of beginning target exchange rate, and the actual exchange rate will be allowed to move in a specific range around that beginning rate. There are many examples of these kinds of arrangements in the real world, especially where countries peg their currency to the dollar. In Europe many countries peg their currency to the euro (like Denmark and the Baltic States). By doing so, they form an “incomplete” monetary union with the country to which they peg, an alternative to a single currency (Grauwe, 2009).

One common feature of these “incomplete” monetary unions is that over time most of them tend to disintegrate after some crisis. In 1973, the Bretton Woods system collapsed, and in 1993 the same happened with the exchange rate mechanism (ERM) of the European Monetary

System. Countries pegging their currency to another one have most often been hit by a speculative crisis, resulting in the peg being abandoned. An example is the South East Asian currencies that were hit by speculative attacks in 1997-98. Another example is the Latin American currencies in the 1990s (Grauwe, 2009).

Whether a fixed exchange rate system is fragile or not, mainly depends on credibility. When a country fixes their exchange rate to another currency, they pledge to keep the exchange rate fixed today and in the future. However, there may be circumstances where the fixed exchange rate arrangement ceases to be seen as serving the national interest of the country. Then doubts as to whether this promise can be kept develop. As soon as a country has an incentive to renege on its promise, economic agents will attack the currency, resulting in a speculative crisis. There are mainly two problems that can put a country into a situation like this, reputation and the fact that more than one country needs to implement the same monetary stock and interest rate (Grauwe, 2009).

Differences in reputation lead to low credibility of a fixed exchange rate. A central bank that promises to fix the exchange rate today and in the future also pursues a domestic objective. This objective could be stabilization of unemployment, stabilization of output or the financing of the government budget deficit. A regime where a central bank fixes the exchange rate and then gives a positive weight to a domestic objective will not be credible. Rational agents will test the central bank and attack its stock of international reserves. This means that fixing the exchange rate will most of the time not be credible, since most central banks give some positive weight (however small) to domestic objectives. Given that the central bank attaches a positive weight to a domestic objective, an economic shock gives stronger incentives to devalue. The temptation to devalue increases with the size of the shock; as the shock becomes larger, the cost in terms of lost employment increases, creating stronger incentives for the central bank to devalue the currency. The probability that some shock could become large

enough for the fixed exchange rate to be non-credible increases as time goes by. Krugman (1979) stressed that fixed exchange rates would inevitably collapse when the monetary authorities pursue domestic objectives. Since 1990s many countries have liberalized capital movements, which make the fixed exchange rates more fragile. In a world of high capital mobility, the expectations of a devaluation leads to an immediate increase in domestic interest rates and large outflows of capital. All these aspects raise the cost of defending the existing peg, and thus the temptation of the authorities to abandon the fixed peg. Hence, the fixed exchange rate regime becomes more prone to unpredictable self-fulfilling speculative attacks. In addition, contagion is more likely to be a problem when the capital mobility is high. An example is East Asia during 1997-98 when one currency after the other in that part of the world was gripped by speculative attacks. Both the Bretton Woods system and the EMS are examples on fixed exchange rates systems that used the asymmetric solution mentioned earlier. This solution generally does not work well. In particular, when a speculative crisis arose and required intervention in the foreign exchange market, the leading-currency country (the USA in the Bretton Woods system, Germany in the EMS) was generally unwilling to allow its money stock to increase and its interest rate to decline (Grauwe, 2009).

3.3.1 Argentina

Argentina is a prominent example of a country that enacted a fixed-rate tie through a currency board, and faced some of the same problems as Greece in the eurozone. Argentina wished to stabilize their inflation in the 1980's. In 1991 they aimed to divorce money creation from the political arena through a Convertibility Law fixing a one-by-one exchange rate between the Argentine peso and the US dollar. After the currency was tied, the inflation rate in Argentina fell and real output per person stabilized. The currency board was however affected by external shocks. In 1994-1995 the Mexican crisis resulted in a liquidity crunch that increased interest rates, stalling growth and increased unemployment. The Asian financial crisis in

1997, and the Russian crisis in 1998 increased the interest rates even higher, and the borrowing costs for Argentina was kept high. The country had to reduce its budget deficit in 1998 because of an increase in external debt load from 29 percent of GDP in 1993 to 50.3 percent in 1999. Moreover, this debt was in foreign currency, as domestic private savings remained low. A concomitant financial crisis in Brazil in 1999 had the most severe effect on the economy, because Brazil is Argentines largest trading partner. An appreciating US dollar and a slump in the world prices of primary products further contributed to Argentines problems. This resulted in falling tax revenues, further widening of the government deficit and a weakening of Argentines competitiveness in the world markets. This raised further concern about the ability of the government to service its debts, which depressed the financial markets and further deepened the recession. Since the exchange rate was fixed to the dollar, the country could not use monetary policy as a tool to reduce its deficit. When the recession evolved, the government in Argentina increased taxes in 2000 after advises from the IMF. The hope was to reduce the deficit, lower interest rates, and pull the country out of recession. However, things only got worse as rising criticism of the tie to the dollar and its role in bringing about the recession stimulated concern that a devaluation of the peso was in offing. There were made various attempts to solve the crisis, with more international bank lending, new IMF loans and debt swap arrangements. Several more rounds of contractionary policy followed, and after the seventh austerity round in July 2001, a nationwide strike was triggered. In late 2001, the IMF refused to release a US1.3 billion tranche of its loan, citing the failure of the Argentine government to reach the budget deficits targets. Further budget cuts were demanded. People began withdrawing large sums of dollars from their bank accounts. An economic meltdown was followed by a default on foreign debt. In 2002 the currency board was officially ended. In the case of Argentine, Appleyard, Field and Cobb (2010) argue that the fix of the exchange rate was never credible, as they failed to meet many

of the key requirements for a successive fix. Argentina is also subject to asymmetric shocks compared to the anchor country United States (Appleyard, Field jr, & Cobb, 2010). Fran (2004-05) states that the labor markets in Argentina were fairly inflexible during the currency board. The country was also relatively closed, and the main trading partner was Brazil and not the US which would have been preferable. In addition, the authorities were not able to keep the government budget under control. Over the long run, the currency board can only remain credible with low indebtedness of the government. Bleaney (2004) notes that the debt burden in Argentina was not a problem as long international investors remained convinced of Argentina's ability to keep control of the debt dynamics. But with investor confidence draining away, Argentina was heading rapidly for a debt crisis.

3.3.2 Hong Kong

An example of a currency board that so far has been successful is Hong Kong which has pegged their currency to the dollar since 1983. The US is a major trading partner of Hong Kong. Its currency is the predominant international currency in which a significant proportion of Hong Kong's trade is denominated. A fixed exchange rate system has been a norm rather than an exception in the history of Hong Kong. This largely reflects the characteristics of Hong Kong as a highly externally-oriented economy, which desires a firm anchor for the external value of its currency. This is where Hong Kong differs from most other currency board economies that in recent years adopted the system as a strong commitment to halt hyper-inflation. The structure of the economy in Hong Kong is characterized by a high degree of openness, complete absence of exchange controls, and sizeable financial flows. In the 1980s the HKD (Hong Kong Dollar) experienced several episodes with strong pressure for a revaluation, but the nominal exchange rate stability was maintained by the government's threat of negative interest rates. While it successfully fended off the speculation, there was clearly a need to introduce fundamental reforms. Since 1988, a series of reforms in three

broad directions were launched: 1) tightening the discipline in the management of interbank liquidity; 2) setting up a mechanism for the provision of short-term liquidity assistance; and 3) strengthening the institutional framework for monetary management. After the Asian financial crisis broke out in 1997, there was a speculative attack on the HKD in October that year. In response, the monetary authorities in Hong Kong purchased HKD, which caused short-term interest rates to rise very sharply, with the overnight rate briefly reaching 280 percent. Subsequently, market conditions normalized. While the exchange market remained turbulent in the first half of 1998, the Currency Board successfully withstood incidents of selling pressure in January and June. However, a new and more dramatic speculative attack occurred already in the autumn that year. During the most active period of speculation that took place in late August, the Exchange Fund took the unprecedented step of purchasing equities for some 15 billion USD to impose losses on those taking short positions in the equity market. This calmed the equity and foreign exchange markets and more tranquil conditions were restored. Although a sizeable amount, the operation did not affect the full backing requirement of the currency board system, as Hong Kong's official reserves (contributed by cumulative earnings, transfers of fiscal surpluses and the monetary base) were more than three times the monetary base. The severe attacks on the exchange rate led the authorities to improve the resilience of the Currency Board arrangement in late 1998. The most critical element was a clear undertaking by the monetary authorities to licensed banks to convert HKD to USD at a fixed exchange rate, making the commitment to the link even more explicit. A second change was to revamp the mechanism for providing liquidity assistance. A third feature of the changes was an increase in the level of transparency regarding the operations conducted by the monetary authorities in Hong Kong (Hong Kong Monetary Authority, 1998). As with any other currency boards it is impossible to use monetary policy in order to stabilize the business cycle, any macroeconomic adjustment has to be achieved by changes in

the prices of assets and labor. In Hong Kong this is made easier by two factors. First is the openness of the economy with an aggregate demand heavily dependent on international trading partners. This reduces the risk of short-term interest rates that are near zero and fluctuations in the monetary base that fail to translate into fluctuations in general price levels. The second factor is the scarce political power of the trade unions, which makes it easier to trim the nominal salaries during recessionary time (Chiu, 2001).

3.3.3 A comparison of the currency boards in Hong Kong and Argentina

There are many important experiences to draw from the cases of currency boards in Hong Kong and Argentina. Here is a summary of the differences between the two fixed exchange regimes, which can give valuable information on how to analyze Greece's monetary union membership.

Both Argentina and Hong Kong pegged their currency to the US dollar. A clear advantage for the fix in Hong Kong is that the US is a major trading partner of Hong Kong. This was not the case in Argentina where both Brazil and the eurozone stood for a larger trade proportion than the US. When the Argentine peso got overvalued against their most important trading partner Brazil, Argentina's goods were not competitive anymore. Hong Kong is also an open economy, with an aggregate demand heavily dependent on international trading partner. Argentina was a relatively closed economy. In the period of the Argentine currency board, exports in goods and service as percentage of GDP were about 10 percent. In comparison, Hong Kong exported goods and services of approximately 130 percent of GDP in the same period (The World Bank). Another difference is the degree of flexibility in the two countries. The Hong Kong Monetary Authority (2002) states that internal flexibility is a key factor underpinning the sustainability of any fixed exchange rate. They have done a quantitative analysis that has shown that prices and labor costs adjust to cyclical conditions more readily in Hong Kong than it did in Argentina. Meanwhile, Frank (2004), states that one of the main

factors of the failure of the Argentine currency board was their fiscal policy with imperfect budget discipline together with a difficult international financial environment. These differences, together with the criteria in the theory of optimal currency area will build up the framework of this thesis.

Chapter 4 Framework

Whether Greece should stay in the eurozone or not, is not a question with a black and white answer. 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 in the case of Greece depends on the not so straightforward analysis of the costs and benefits of a membership attached to the political and social preferences of giving up national sovereignty. One way to encounter the situation is to study how the eurozone function with respect to the theory of optimum currency areas. Some of the aspects are connected to each individual member country, and some to the union as a whole. Another way to meet the discussion is to study the indicators that led to the failure and success in the respective currency boards of Argentina and Hong Kong, and compare these to Greece. The framework on how to analyze these aspects will be accounted for in this chapter. First the history of the EU and the eurozone will be reviewed. The history will establish how the eurozone fulfill the first necessary characteristic of an optimum currency area that regards the elimination of trade restrictions and common trade policy. The next three characteristics of the theory, in addition to the experiences made in Hong Kong and Argentina will be analyzed in what follows.

4.1 The history of EU and its monetary union

The eurozone area consists of 17 countries despite the European Union being comprised of 27 countries. The formation of the European Union began in 1951 when the Treaty of Paris was signed by Belgium, France, West Germany, Italy, Luxembourg and the Netherlands. This treaty dealt with the European Coal and Steel Community. In 1957 two new treaties were signed and formed the European Community. From 1993 the European Community has been officially called the European Union. In 2007 the Union totaled 27 countries. The objective of

the Union was an integrated market of the free movement of goods, services, capital and people (Appleyard, Field jr, & Cobb, 2010)

For the Union to achieve these goals it was important to obtain grater political cohesion, which was done by establishing various supranational institutions. The leadership lays with the executive body the European Commission, while The Council of Ministers is the decision-making unit on communitywide matters. Broad Policy guidelines are set by The European Council, which consists of member countries' political leaders. The European Parliament is elected by voters from the member countries, and the parliament makes proposals to the Commission. Dispute settlements and interpretations of constitutions are exercised by the Court of Justice (Appleyard, Field jr, & Cobb, 2010).

In the 1960s the European Community experienced a rapid growth among their member countries after adopting a common external tariff and eliminating internal tariffs. The GNP growth rate within the Community was higher than the growth rate in the US, and some believed the establishment of the EC itself was the reason for growth. However, the next decade gave way to disappointments. Two oil crises in 1973-1974 and 1979-1980, accompanied by periods of simultaneous recession and inflation, led to slow growth and increasing unemployment in Europe. The slow growth continued in the first half of the 80s. Annual EC real GNP growth fell to 1.4 percent, while the US had a growth on 2.3 percent, and Japan grew at a rate of 3.7 percent (Appleyard, Field jr, & Cobb, 2010).

To "catch up" with the US and Japan the European Commission issued a policy paper in 1985 called "Completing the International Market: White Paper from the Commission to the European Council". This paper described changes to eliminate internal barriers like differences in technical regulations between countries, delays at frontiers for customs purposes, restrictions on competition for public purchases and restrictions on freedom to

engage in certain service transactions. In December 31, 1992, all the internal market restrictions were removed, and the term EC92 came into existence to indicate the target for complete integration of the Community. The next important step in the European integration process was to move towards the goal of full monetary union by January 1, 1999. 11 nations qualified for an adoption of the euro on this date. Greece was a late qualifier and adopted the euro in 2001, just in time to be among the first wave of countries to launch euro banknotes and coins on 1 January 2002 (Appleyard, Field jr, & Cobb, 2010).

Within the eurozone, goods, services and people can move freely. Furthermore, the previous national frontiers between EU member nations have been dismantled; this has opened up economic free trade and working opportunities (European Commision, 2002).

The European Central Bank (ECB) is the institution responsible for the monetary system of the 17 countries in the eurozone. The national banks in each member country work together with the ECB to formulate monetary policy that helps maintain price stability. Primary responsibilities of the ECB is to formulate monetary policy, conduct foreign exchange, hold currency reserves, authorize the issuance of bank notes, and promote the smooth operation of the financial market infrastructure for securities in Europe (Investopia). In the institutional framework for the single monetary policy it is laid down that the ECB is independent. Neither the ECB nor the national central banks, nor any member of their decision-making bodies, are allowed to seek or take instructions from EU institutions or bodies, from any government of an EU member state or from any other body. All ECBs financial arrangements are kept separate from those of the EU, and the central bank is prohibited from granting loans to EU bodies or national public sector entities (The European Central Bank). In addition, the ECB is directly responsible for overseeing financial markets infrastructures. This involves the flow of funds, securities and other financial instruments among buyers and sellers, borrowers and lenders (The European Central Bank).

The euro was created because of the advantages and benefits a single currency offered over the previous situation where each member of the EU had its own currency (European Commission, 2011). The Commission notes that a single currency eliminates fluctuation risks and exchange costs, and strengthens the single market. In amendment, the Commission states that the euro means closer co-operation among member states for a stable currency and economy to benefit them all. The ECB sums up the benefits of the euro as: 1) low interest rates due to a high degree of price stability; 2) greater price transparency; 3) removal of transaction costs; and 4) elimination of exchange rate fluctuations. The elimination of costs, risks and lack of the transparency connected with the need to exchange currencies in cross-border transactions is one of the beneficial factors emphasized by the ECB. This makes doing business in the euro area more cost-effective and less risky. Increase in price transparency encourages cross-border trade and investment of all types.

4.2 Fiscal policy and its importance in the EU

Fiscal and monetary policies are the tools used by a state to achieve its macroeconomic objectives. Fiscal policy means using government spending and taxing to impact the economy. Monetary policy can be used to boost or slow the economy by controlling the supply of money. In the eurozone, the responsibility over monetary policy is assigned to the ECB, while the fiscal policy remains the remit of each individual member state. To keep the values of the single currency stable it was necessary to provide conditions over national fiscal policy. This was covered under the Treaty on the Functioning of the European Union (hereinafter referred to as the "Treaty") together with provisions on monetary and fiscal policy interactions (The European Central Bank, 2012).

In the Treaty it is clearly stated that the main objective is to maintain price stability in the eurozone. A formal framework was created regarding requirements for fiscal policy across nations in the area, but it is each country's responsibility to ensure a commitment to sound public finances. Even though fiscal policy is decided in each member state while the monetary policy is governed by the ECB, they interact in various ways. A monetary policy that ensures stable inflation expectations and low inflation risk premium helps to limit the level and volatility of long-term interest rates. A more stable interest rate is beneficial to the governments financing cost. It also works the other way around. Fiscal policy affects the monetary policy through both demand-side effects and by shaping the supply-side of the economy. This is done by tax-regimes or by influencing long-term interest rates via the issuance of public debt. However, the debt crisis has shown that the two policies do not mutually reinforce. Unsustainable public finances and high levels of debt have made the stability oriented monetary policy difficult to conduct. In recent years it seems as if weak public finances can lead a country into a vicious circle that puts the financial system under strain. If the fiscal positions are worsened, the sovereign debt are repriced, which has an adverse impact on the financial system via banks' exposure to government bonds. This has a negative effect on the macro economy, and the financial markets and public finances are weakened even further. Then the operation of the monetary policy gets riskier, through more volatile and illiquid sovereign bond markets, and a more unstable banking system (The European Central Bank, 2012).

When the eurozone was founded, it was clear that unsustainable fiscal positions could interfere with the smooth conduct of a single monetary policy. In the Delors Report[2] it was stated that a single currency would assume a common monetary policy and require a high

[2] A committee established by the European Council in 1988 for the Study of Economic and Monetary Union. The committee (The Delors Committee) was founded to study and propose concrete steps towards establishing economic and monetary union. The result was the "Delors Report", which in essence was a concrete plan for the introduction of EMU.

degree of compatibility of economic policies, particularly in the fiscal field. The report also said that uncoordinated and divergent nation budgetary policies would undermine monetary stability. It mentions that the access to large capital market may for some time even facilitate the financing of economic imbalances. If a currency union has fully integrated capital markets, governments and private agents can draw on a larger pool of savings to cover their borrowing. This means that an individual country can increase their borrowing, and only raise funding costs moderately. However, the overall policy framework of EMU was designed to safeguard the value of the single currency, and at the same time oppose any adverse side effects on incentives to keep sound public finances.

Grauwe (2009) points out two factors that are important as to whether a monetary union increases or reduces the degree of fiscal discipline of countries joining the union. One factor leads to incentives for larger budget deficits, and one which tends to reduce the incentives. The first one can be explained by the example of a sovereign country which issues debt denominated in the domestic currency. The interest rate it will have to pay reflects a risk premium consisting of two components, the risk of default and the risk that the country will devalue its currency in the future. For most countries the latter is most likely. As a result, when a sovereign country issues too much debt, it is a quickly increasing risk of future devaluation, which again makes the interest rate at which the authorities have to issue new debt also increase. Hence, the market is quick to penalize the authorities, reducing their incentives to issue excessive debt. In a monetary union however, this mechanism will be weaker. The currency in which the debt is issued cannot be affected by devaluation. Thus, there is no longer any devaluation risk for the holder of this debt. As a result, when the authorities of a member state issue too much debt they do not face a quick increase in interest rate on their new debt issues. The component of default risk is still there, and this will increase when the country accumulates debt. However, the other members in the union extend

an implicit bail-out guarantee, and this gives an incentive to member states to issue unsustainable amounts of debt. This phenomenon is previously mentioned as a moral hazard problem. Grauwe (2009) argues that even a no-bailout provision may not solve this problem because it is not likely to be credible. In the EU it is agreed upon a "no-bail-out clause" (Article 125 of the Treaty on the Functioning of the European Union). However, if a country in the European Union would be unable to service its debt, it was uncertain whether the member states of the union would stick to this clause. This has now been proven not credible trough the partial default in Greece. When it comes to the factor which tends to reduce the incentive of member states of a monetary union to run excessive deficits, this is the country's ability to finance deficits by money creation. When a country joins a monetary union this ability is reduced, and the governments of member states face a "tougher" budget constraint than sovereign nations that maintain their own currency. Sovereign nations have easier access to the local national bank which can be pressured to alleviate the burden of financing budget deficits. For sovereign nations this creates incentives for having larger budget deficits. Which one of these two factors -the moral hazard or the no-monetization one- prevails is essentially an empirical question in that it depends on institutional features and on the incentives governments face (Grauwe, 2009).

4.3 Indicators of costs and benefits of being a eurozone member

The indicators to draw conclusions on whether Greece should stay or leave the eurozone can be divided in two parts. First, there are indicators representing costs and benefits of being a monetary union member with respect to the theory of optimum currency areas. Since monetary union members have given up the possibility to allow their currency to float against the anchor currency, and hence given up their national monetary policy as a tool for economic

adjustments, the characteristics of an optimal currency area need to present to avoid imbalances. Not fulfilling the necessary characteristics would indicate that Greece should not be part of the eurozone, or at least that the country most likely experiences that the costs of being a member exceed the benefits. Second, there are lessons to be learned from the failure and success of the currency boards in Argentina and Hong Kong. This section will look at how to analyze Greece's flexibility, openness, fiscal policy, the eurozone fiscal mechanism, the likelihood of asymmetric shocks and asymmetric effects of external shocks. How to discuss the effects of the bailout packages will also be presented here.

The first point in the theory of optimum currency area is that there should be no barriers to trade. This is accounted for in the section of the history of EU and its monetary union, and will be discussed with respect to rules and laws concerning customs and taxes and within the EU, since these are the prevailing regulations in Greece as well.

The point of having no trade barriers is to promote trade between member countries. A relevant measure of the effect of the trade policy is thereby Greece's degree of openness. This quality was also an important factor in the currency boards of Hong Kong and Argentina. Hong Kong is a relatively open economy, while Argentina was a relatively closed economy during their currency board. It is likely to think that a country with a low trade share gains less benefit from being a member of a monetary union, as many of the gains of being a monetary union member are attached to trade benefits and integration. This is in accordance to what the ECB has stressed as one of the beneficial factors of the eurozone. The elimination of costs, risks and lack of the transparency connected with the need to exchange currencies in cross-border, makes doing business in the euro area more cost-effective and less risky. However, if

a country is relatively closed, these benefits will not be particularly relevant in a cost/benefit analysis. In addition, an open country can more easily adjust to asymmetries in the economy than a closed one as it would be more integrated. McKinnon (1963) argues that a country that is highly integrated through openness and factor mobility will gain the most from forming a monetary union. A country's openness can be analyzed in two ways. First, the country's export of goods and services as a percentage of GDP gives an easy and straightforward picture of the country's openness. Even though the economies of Hong Kong, Argentine and Greece have many differences, comparing these indicators will give an indication of Greece's degree of openness in relation to Hong Kong and Argentina. Second, and more relevant when analyzing Greece's degree of openness as a eurozone member, is its importance of intra-EU trade. This method has been used by Grauwe (2009), who argues that for countries with large degree of openness relative to other EU-partners, the cost/benefit calculus is likely to show net benefits of being in the eurozone. He measured the openness by the country's share of intra-EU exports as a percentage of GDP relative to the other eurozone members. The same method will be used in this analysis, with data from the last five years. To say something about the degree of openness, the analysis will be based on Greece's share of intra-EU exports against the EU average, where the EU average is the turning point of whether the country is relatively open. The analysis will state; the higher above the average, the higher degree of openness, and vice versa.

If a country faces permanent asymmetric shocks that require changes in relative prices, it can be a handicap to lose the exchange rate to adjust to these shocks. In that case it would be beneficial if the country experience high flexibility, or low degree of rigidities, in wages, prices and labor markets. With fixed exchange rates, possible deviations must be compensated completely through real adjustment. Gurtner (2004) even states that "flexibility of the labor

market is […] the key to currency board sustainability". Labor markets in Argentina were fairly inflexible during the currency board era, and this has been stated as a large cost for the Argentine economy during the regime with fixed exchange rate. Naturally, this needs to be analyzed in the case of Greece. If Greece has high degree of labor market flexibility, the country can more easily adjust to asymmetries in the economy, hence, they experiences lower costs of being a monetary union member than countries with high degree of rigidity. Flexibility is a difficult concept to quantify, but a comparison of the development in different macroeconomic indicators can give a helpful indication. Heinz and Rusinova (2011) used the response of wages to cyclical unemployment to measure wage flexibility for the ECB. The flexibility is defined through a negative correlation between the level of unemployment and the level of wages. If unemployment rises, wages should drop in the case of wage flexibility. Price flexibility can be measured by changes in the CPI index with respect to changes in wages. If prices are flexible, there should be possible to see a positive correlation between the changes; an increase in wages should result in an increase in the CPI index. Both wage- and price flexibility will be analyzed by quarterly data over the years 2009-12, and the correlation between the data will be used to discuss the degree of flexibility. In the case of measuring labor mobility, The Deutsche Bank's (2011) method will be employed. They used the indicator of net migration and compared it to the unemployment rate. To make an analysis of the data on labor mobility it will be more interesting to look at a period from the entrance to the eurozone in 2001 until 2011 than from quarter to quarter, as the process of moving to another country is not something that happens over night.

Net migration shows the difference between the numbers of people who arrived and left Greece during one year. While not giving actual figures on how many people that left or arrived, it does show if the country attracted more people or if it saw more people leave. A significant negative link between the unemployment rate and net migration would imply some

labor mobility. If unemployment rises and there is a negative net migration it indicates that people who do not have work in Greece move to another country. It has to be noted that this indicator, however, covers the entire population, rather than just those of working age, and it includes movements in and out of the EU, instead of just movements within the EU. Nevertheless, as most people who move are of working age and as three quarters of the people who move to an EU region come from another region within the EU, net migration is a good source of information for identifying regions losing or gaining working age populations from within the EU (European Commission, Regional Policy, 2008).

As previously mentioned, there is no straightforward way to quantify flexibility. This thesis does not give room for a detailed statistical analysis to determine the degree of flexibility, but it is an important feature that needs to be discussed when looking at costs and benefit of a eurozone membership. The correlations between the data regarding the flexibility will therefore be analyzed on a superficial level, where an observable correlation is considered "high" and beneficial, while no correlation is considered "low" and a cost.

The size and nature of asymmetric shocks and asymmetric effects of external shocks are of great importance in the discussion of whether a country should be part of a monetary union or not. The occurrence of asymmetric shocks creates costs of adjustment, especially if there is lack of flexibility in the labor markets. A country that is relatively closed is more likely to experience asymmetric shocks or asymmetric effects of external shocks with the country that it has fixed its currency. In Argentina's case, the country was relatively closed, and the main trading partner was Brazil, not the US. This became a problem when Brazil experienced a financial crisis and abandoned its peg to the dollar in early 1999. With Brazil as its most important trading partner, Argentina experienced asymmetric shocks compared to the US.

The member countries in the eurozone exercise considerable sovereignty in several economic areas that can create asymmetries in the economy. There are also many national economic institutions in the eurozone, which can result in differences in the workings of financial markets that leads to divergent effects of the same interest rate shocks. To deal with the problem of asymmetries in shocks a statistical methodology was developed to use in the context of optimal currency area. The methodology consists of extracting the underlying demand and supply shocks from the price and output data. First the vector autoregressions are estimated, then demand and supply shocks are identified with the restriction that demand shocks have only temporary effects while supply shocks have permanent effects on prices and output. This extraction is done for every union member, and the correlation of these demand and supply shocks with the average of the union is then computed. Negative correlation of demand shock is most often a result of countries pursuing independent monetary policies. Once in a monetary union, this source of asymmetry will disappear. The correlation of supply shocks on the other hand, is most likely to continue. This statistical experiment goes beyond the limitations of this thesis, but the results of such an experiment are very useful. In 2001, Korhonen and Firdrmuc did the experiment for the eurozone countries, and their results will build a foundation that makes it possible to analyze the degree of asymmetric shocks in Greece and the rest of the eurozone. The correlation of supply shocks will be given most attention, since these shocks have a structural nature and are assumed to continue to exist. The correlation will be scaled from 0.0 – 1.0, where a correlation between Greece and the rest of the member countries around 0.0 is considered extremely low, a perfect correlation of 1.0 is considered extremely high. The limit set to be able to discuss the level of asymmetries will be at a correlation of 0.5. Again there is no answer book solution to where this limit should be, so it is thereby set on the middle of the scale of pure logical reasons. When it comes to asymmetries in the effects of external shocks in Greece, this can be analyzed by the

macroeconomic data provided in chapter 2. The financial crisis in 2007 was an external shock that hit the whole EU. How the macroeconomic indicators in Greece diverged after 2007 gives valuable information of how the country experienced asymmetric effects of the recession compared to other eurozone members. All the necessary indicators are presented in chapter 2, and will be discussed in chapter 5.

Another important factor that ultimately led to the collapse of the currency board regime in Argentina was their fiscal policy. This factor is clearly relevant in Greece's case as well. Argentina has long been known for weak tax collection. From 1994 Argentina ran an ever growing budget deficit, and in the period 1993-99 the external debt load increased from 29 to 50 percent of GDP. In 2000 the president with the blessing of the IMF increased taxes. This had not the desired effects. In contrary, the tax increase was impeding the recovery and most importantly undermining investor confidence. Frank (2004-05) states that the debt burden as such had not been a major problem, but with several factors joining together Argentina's situation deteriorated. As Bleaney (2004) notes, the debt burden first became a problem when international investors lost confidence in Argentina's ability to keep control of debt dynamics. After the emerging market crisis of 1998 this was aggravated by the increased cost for refinancing. How Greece has implemented their fiscal policy and how the financial crisis has affected the confidence in the country's ability to control its debt, are presented in chapter 2, and will be discussed in chapter 5.

There are many indicators that can provide information on whether it is optimal for Greece to be in a currency area with the rest of the eurozone, but it can also be asked whether the eurozone itself is vital in the long term. The fiscal mechanism in the eurozone is one of the

issues that are argued to be problematic for the monetary union's survival. Grauwe (2006) argues 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. Tsoukalis (2012) supports this and states that EMU needs to move further towards a fiscal union. Research by Kim et al. (2012) provides evidence for fiscal problems in a single-currency area without a fiscal federalist system. Rockoff (2000) argues that it took the US a minimum of 150 years to meet the criteria for an optimal currency region and that this did not happened until the country implemented a system of fiscal transfers and deposit insurance in the 1930s. Kenen (1969) argues that it is desirable to centralize a significant part of the national budgets to the European level. A centralized budget allows countries that are hit by negative shocks to enjoy automatic transfers, thereby reducing the social costs of a monetary union. Under a centralized system Greece would automatically experience a redistribution of income from member countries in good economic state, while under a decentralized system Greece would increase its external debt by receiving fiscal transfers from these countries. In the eurozone the ECB have the responsibility for the monetary policy, the Treaty gives a formal framework regarding requirements for fiscal policy across nations in the area, but it is each country's responsibility to ensure a commitment to sound public finances. The relevant fiscal mechanism is the centralization of budgetary systems in the whole European Union. There is no straightforward answer to what degree of centralization that is optimal, but the level of centralization can be measured with respect to what is considered to be total centralization and total decentralization. This is be measured by comparing how much the European budget amounts of EU GDP relative to how much national budget normally amounts of GDP. By assuming that the normal national budgets share of GDP represents total centralization, it can be developed a scale where budget centralization on the same level as the normal national budgets share of GDP has the value of

1, and total decentralization has the value of 0. The degree of centralization can then be stated using the multiplier:

100/(National budgets share of GDP) (4)

Because there is no book answer of what is the optimal degree of centralization, the turning point of what is a cost and benefit will as previously be set at the middle of the developed scale.

Another indicator that can represent a cost or a benefit in a monetary union is connected to the preferred inflation rate. This is not one of the characteristics necessary to form an optimal currency area, but it is an indicator that can represent a cost or a benefit. Argentina joined the currency board regime to stabilize their high inflation (Appleyard, Field jr, & Cobb, 2010). If Greece had to give up their preferred rate to stay in the eurozone this would represent a cost, while it is a benefit if the membership helped them keep the rate stable. Historically, countries with high inflation have been enthusiastic to join the monetary union, because an entry was seen as a way to import stability (Grauwe, 2009). To measure the benefits/costs associated with the inflation rate in Greece, the data from the price index in Table 2.1 will form the basis. The ECB defines price stability as a year-on-year increase in the CPI for the euro area of below 2 percent. The Governing Council has also clarified that, in the pursuit of price stability, it aims to maintain inflation rates below, but close to, 2 percent over the medium term (The European Central Bank). Since there are always some fluctuations in the inflation rate it would not be realistic to not allow any fluctuations when considering whether the rate is stable. In this analysis, fluctuations of more than ± 1 percent from the target rate below 2 percent will be considered "not beneficial" as the ECB goal clearly states below, but close to, 2 percent. Fluctuations like this, more than one year in a row, will represent an unstable

inflation rate. Another cost/benefit indicator from the optimal currency area theory accounted for in chapter 3 that is not directly one of the necessary characteristic, but can represent a cost of fixing its currency, is the growth rate. If Greece was a fast growing country, they would experience trade balance problems, as its imports would tend to grow faster than its exports. To determine if this is the case in Greece, the growth rate will be analyzed through data on the average yearly growth rates of GDP. To get numbers not heavily affected by yearly fluctuations the rate will be an average of the annual rates as long back as possible. Eurostat statistics on this data do not go further back in time than 1996, so the period will be from 1996 to 2012. Greece will be compared to the other eurozone countries (except Malta where there are no data available before 2000) and to the eurozone average. A GDP growth rate higher than the other countries would indicate a cost of being a monetary union member.

The last indicator that can be used to discuss whether Greece should stay or leave the eurozone is the effects of the economic aid they have received from the ECB, the IMF and the EU. Greece has received bailout packages and partly defaulted on their debt. The actions taken to solve the crisis will be presented below. Owing to the fact that the first bailout package was given in 2010, it is now possible to look at how effective this package was and get an indication of whether the actions taken to solve the crisis will fulfill their purpose. This can be done by comparing the macroeconomic indicators showed in Table 2.1, before and after the implementation of the first package. Some of the indicators have data available for both 2011 and 2012, this will help give an indication of the long-term effects.

Table 4. 1 Summary of the indicators of costs and benefits of Greece staying in the eurozone

Indicator	How to measure/discuss	Cost	Benefit
Wage flexibility	Degree of correlation in unemployment and wages	Low	High
Price flexibility	Degree of correlation in wages and CPI	Low	High
Labor mobility	Degree of correlation in unemployment rate and net migration	Low	High
Openness	1) Export of goods and services as % of GDP 2) Share of intra EU exports in % of GDP	1) Closer to the Argentine level 2) < eurozone average	1) Closer to the Hong Kong level 2) > eurozone average
1) Asymmetric shocks 2) Asymmetric effects of external shocks	1) Correlation of demand and supply shocks 2) Changes in macroeconomic indicators after 2007	1) Low correlation (< 0,5) 2) Divergence	High correlation (>0,5) 2) Convergence
Fiscal policy	Implementation of fiscal policy	High debt level, constant budget deficits, loss of government confidence	Low debt level, low budget deficit or budget surplus, confidence in government
Fiscal mechanism	EU budget share of GDP/ National budgets share of GDP	<0,5	>0,5
Inflation	Fluctuations	> ± 1 percent from below, but close to, 2 percent	< ± 1 percent from below, but close to, 2 percent
Growth	Average yearly growth rate of GDP	>eurozone average	<eurozone average
Effects of first bailout package	Development in indicators in Table 2.1 after first bailout (2001)	Negative	Positive

4.4 Actions taken to solve the crisis

The leaders of the European Union, the IMF, and the ECB have undertaken substantial measures to avoid an uncontrolled and disorderly Greek default. Nelson et.al. (2011) note that these leaders feared that a default would generate contagion and financial turmoil, and that they wanted to avoid this at all cost. Other eurozone countries with high debt levels might experience a major sell-off of bonds, while European banks exposed to Greece and other eurozone governments might not be able to endure losses on those investments. A summary of what has been done on a yearly basis since 2010 will be given an account for in the following.

4.4.1 2010

Greece announced an ambitious three-year plan to handle their budget deficit in January 2010. In May, the European officials, the IMF, and the ECB agreed on the first bailout package for Greece.

In Greece there were fiscal consolidation and economic reforms. The government announced an aggressive stability program that would seek to cut its deficits by 11 percentage points through 2013, which would result in a deficit below 3 percent of GDP by 2014. The immediate actions were to cut in public spending, raise taxes and attack undeclared work. In addition, the government began implementing a new healthcare and pension reform. The Greek pension system has been seen as one of the most generous in Europe, and the country's healthcare has been considered inefficient. In July 2010 the retirement age got increased and a new reform on how to calculate pension benefits was developed. Within healthcare there was a reduction in total expenditures and consolidation of hospitals. The government also stated a plan to raise €50 billion through a privatization program (Nelson, Belkin, & Mix, 2011).

The eurozone and the IMF delivered financial assistance through a three-year package of €110 billion in loans to Greece at marked-based interest rates. Eurozone members pledged

€80 billion while IMF pledged the rest. A new European financial mechanism was implemented to avoid contagion of the crisis. The mechanism consisted of two temporary three-year lending facilities that could make loans totaling €500 billion to eurozone members facing debt crises. The European Financial Stability Facility (EFSF) was established in 2010 to provide support to eurozone countries. The lending facility was set to last until 2013. (Nelson, Belkin, & Mix, 2011).

The assistance from the ECB came through acquisition of government bonds in the secondary market. The hope was to lower bond spread and increase confidence in eurozone bonds under pressure, it was the first time the ECB had done such an intervention. From May 2010 until June 2011 the ECB bought bonds for €78 billion, and half of these were Greek bonds. In addition, the ECB provided liquidity to private banks in Greece. From January 2010 to May 2011 they increased their support from €47 billion to €98 billion, an increase that amounted to roughly 40 percent of the country's GDP in 2011 (Nelson, Belkin, & Mix, 2011).

The contagion to other countries was however inevitable, something that became visible in the Republic of Ireland in November. The IMF and the EU announced a bailout package to the Irish Republic totaling €85 billion. Growing fears in the market lead to speculation over which countries was next, and the EU denied that Portugal would need a bailout (BBC News, 2012).

4.4.2 2011

At the beginning of 2011 it eventually became clear that Greece would need further assistance if they were to avoid a default, and at the same time other countries admitted it could not deal with their growing debts. In January, the European Union created the European Financial Stabilization Mechanism (EFSM), an emergency funding program reliant upon funds raised on the financial markets and guaranteed by the European Commission using the budget of the

European Union as collateral. This fund had the authority to fund up to €60 billion, which means the rescue funds of the EFSF and EFSM together would dispose €500 billion for the region as a whole. In April, Portugal announced they could not handle their debt, and in May they receive their first bailout package of €78 billion (BBC News, 2012). The Greek economy was contracting more than expected, and the budget deficit was again worse than anticipated. After a speculative attack on Italy, the EU leaders, IMF and the ECB agreed to more austerity measures and financial assistance in Greece, and that the holders of Greek debt would have to accept some losses on their investments. On June 13, S&P gave Greece the lowest credit rating, CCC, in the world (The Guardian, 2012).

In June 2011 the Greek government agreed to implement a new round of austerity measures. There were additional spending cuts and revenue measures during the year. Together with the previous measures, the announced goal was to bring the government budget deficit down to 0.9 percent of GDP by 2015. The program aimed primarily to reduce over-staffing in the public sector, improve the financial performance of state-owned enterprises, and streamline social transfers. Another component of the fiscal strategy was to sell out publicly own property and form a sovereign wealth fund (Nelson, Belkin, & Mix, 2011).

European leaders announced in July that they would assist Greece with €109 billion in new loans. Greece received loans with lower interest rates and longer maturity than originally stated in the bailout package in 2010, and in addition they had the maturities extended on existing loans from other eurozone members. Europe's leaders also committed to support Athens until it was able to return to the financial markets. This was seen as a potentially unlimited guarantee that could see European taxpayers fund Greece for years. For the first time private bond holders was also asked to participate by taking a 21 percent loss on their bond holdings as part of a €37 billion contribution. In October European leaders reached a deal

with Greek debt holders that would see private investors take a 50 percent cut in the face value of their Greek debt bonds (Financial Times, 2011).

4.4.3 2012

In January, Standard & Poor downgraded nine eurozone countries, and blamed it on the eurozone leaders not being able to handle the debt crisis. In addition, they downgraded the EU bailout fund, the EFSF. The leaders of Germany and France threatened to withhold the second aid packages without further cuts and promises of structural economic changes from the Greek government (New York Times, 2012). At the end of the month, 25 of the 27 countries in the EU signed a treaty with rules making it harder to break budget deficits. The austerity measures demanded of Greece continued in February, and the government agreed on a new budget cut of €325 millions. On 13 March, the eurozone backed a new bailout on €130 billion for Greece for the years 2012-2014. After a while the IMF also gave their support. This program would, in addition to bilateral loans from eurozone member states, be financed by the EFSF (European Commision, 2013). Also, the vast majority of Greece's private sector lenders, private banks and hedge funds accepted a 75 percent loss on their Greek bond holdings. This amounted around €60 billion, the largest default in history. European officials also said that Greece needed to do more to crack down on tax evasion, which they called epidemic in Greece (New York Times, 2012). Meanwhile Italy and Spain experienced the crisis reaching them with increasing borrowing costs, and Spain eventually announced they would ask for a loan from the eurozone. On May 6, Greek had a general election where the people voted for parties that rejected the country's bailout agreements. Attempts on forming a coalition failed, and there were announced new elections on June 17 (BBC News, 2012). The turbulent political environment and uncertainty about the election lead to an acceleration of capital outflows and doubts about Greece's capacity to implement the adjustment program. However, the pro-austerity party New Democracy got the largest share of votes in the June

election, allaying fears that the country was about to leave the eurozone. The new government quickly began the process of identifying and taking the measures needed for catching up on the implementation of the austerity program. But it was difficult to fulfill the conditionality after the elections, and the disbursement of the next tranches of the loans from international lenders got delayed. This worsened the economy (European Commision, 2013).

German officials began speaking openly of the possibility of a Greek eurozone exit for the first time in late July. When Prime Minister Mr. Samaras plead for "a little breathing room" in the German press in August, there were signs of a more atoning environment. The leaders of the eurozone started realizing that the austerity measures imposed on Greece had been so tough on the country's living standards that it had become counterproductive (New York Times, 2012).

In September, the temporarily EFSF and the EFSM was replaced by the permanent European Fiscal Mechanism (EFM). On 26-27 November, the euro area's Finance Minister and the IMF agreed to extend the fiscal adjustment path by two years. The primary surplus target for 2014 was also reduced from 4.5 percent of GDP to 1.5 percent of GDP, and until a possibly primary surplus of 4.5 percent of GDP is achieved in 2016 there will be an annual adjustment of 1.5 percent of GDP. In addition they agreed on a package to reduce Greece's debt to 124 percent of GDP by 2020. The package consisted of a cut of 100 bps of the interest rate charged Greece on the loans provided in the context of the Greek Loan Facility, and a cut of 10 bps of the guarantee fee costs paid by Greece on the EFSF (now EFM) loans. Another measure to reduce the debt was an extension of the maturities of the bilateral and EFM loans by 15 years and a deferral of interest payments of Greece on EFM loans by 10 years. The member states also made a commitment to pass on to Greece's segregated account, an amount equivalent to the income on the Securities Markets Program portfolio accruing to their national central bank as from budget year 2013 (European Commision, 2013).

The austerity measures imposed on Greece since 2010 have been given substantial attention in the media, and are of great importance to whether Greece will find its way out of this recession. What austerity measures involve will be described in the next section.

4.4 Austerity measures

According to the *Financial Times* Dictionary, austerity measures are defined as:

"…official actions taken by the government, during a period of adverse economic conditions, to reduce its budget deficit using a combination of spending cuts or tax rises."

(Financial Times Dictionary)

To avoid default, austerity measures are often forced on a country which has unacceptably high debt levels. It includes acts of deficit cutting, reduced spending and slashed public services. Reduced spending can produce immediate reductions in future debt, which means debt as a percentage of GDP will decline, if GDP remains stable. The problem is that austerity usually has the opposite effect, and reduces growth rate over time.

There are various effects on a country that implements austerity measures. These can be divided in economic, political and social effects. The economic effects are a result of the relations between a government's budget and economic activity. When governments cut their spending and raise taxes, consumption and economic output are depressed. Some studies (Bertola & Drazen, 1993) suggest that the relationship between austerity and economic activity is nonlinear, and that it depends on many outside factors. This makes the effects he uncertain. A political effect of austerity measures can be social unrest because most of the measures target development and social spending. For instance, Greece experienced a number of violent protests to the measures undertaken in 2011 and 2012. The austerity measures can

also have large impacts on everyday life, since governments often are both large employers and the provider of social nets. An example is the Family & Parenting Institute project of the development in median household in the U.K. after the government cutbacks in 2011. The Institute projected it would fall in real terms by 4.2 percent over the following five years (Kuepper).

In Greece the result of the austerity measures was increasing debt and higher unemployment. Keynesian theory supports this result. According to the theory, Greece is likely to experience high unemployment because of the recession and the decline in demand for goods and services. Then an economic "snowball-effect" takes shape. An important assumption here is a lag in prices and demand. If a company experiences a decline in demand for their goods, it is assumed they react by reducing their production and use less labor. If this happens to many companies at the same time, which is the case under a general economic recession, too few companies hire the available labor force, and the unemployment rate rises. The unemployed have less money and this in turn reduces their consumption of goods and services, and the ball begins rolling (Steigum, 2004).

Chapter 5 Analysis

5.1 Greece's costs and benefits of being a eurozone member

The economic situation in Greece after the recession stroke in 2007 has made the country depended on bailout packages from EU, the ECB and the IMF to stay in the eurozone. The main purpose of this thesis is to analyze whether Greece should keep fighting to stay in the eurozone, or if the country should leave. There are both benefits and costs attached to being part of a monetary union. The theory of optimal currency area states necessary characteristics for a membership to be beneficial when the national monetary policy is lost, while the cases of the currency boards in Hong Kong and Argentina gives valuable experience to the discussion. By using the framework developed in chapter 4, this chapter will analyze Greece's costs and benefits of staying in the eurozone.

5.1.1 No barriers to trade

As pointed out in the history of EU and its monetary union, the member countries adopted a common external tariff and eliminated internal tariffs in the 1960s. All internal market restrictions were removed in December 31, 1992, and the term EC92 came into existence to indicate the target for complete integration of the Community. Today goods, services and people can move freely within the eurozone, so there is no doubt that the barriers to trade with respect to customs and boarder laws are eliminated. But there can still be cultural and linguistic differences that can act as barriers to trade and mobility. This cannot be changed by eliminating tariffs and imposing a single currency. Greece's degree of openness and flexibility can be an interesting indicator in that case.

5.1.2 Openness

Greece's degree of openness to the other eurozone members is in this thesis measured in two ways. First, the country's exports of goods and services as percentage of GDP are compared

to the same rate in Argentina and Hong Kong, and presented in Table 5.1. Since the relevant data from Argentina mainly are from their currency board regime, and since it is interesting to see the development in the data before and after Greece's implementation to the eurozone, and before and after the recession set in, the time period stretches from 1990 -2011.

Table 5. 1 Export in goods and services as % of GDP

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Argentina's export as % of GDP	10	8	7	7	8	10	10	11	10	10	11
Hong Kong's export as % of GDP	131	134	138	135	134	143	136	129	124	127	142
Greece's export as % of GDP	18	17	18	17	18	18	18	20	34	32	49
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Argentina's export as % of GDP	12	28	25	25	25	25	25	24	21	22	22
Hong Kong's export as % of GDP	137	147	168	187	195	202	204	209	191	219	225
Greece's export as % of GDP	25	22	21	23	23	23	24	24	19	22	25

Source: The World Bank

Table 5.1 shows a clear difference between Hong Kong with its successful currency board, and Argentina and Greece. There is no doubt that Hong Kong is an extremely more open economy, with an export value of double its GDP rate. This is an extreme export rate compared to Argentina under their currency board regime, where the export only constituted values of around 10 percent of GDP. As previously mentioned is Hong Kong considered a highly externally-oriented and open economy, and this has been stated as one of the main reasons why the currency board has been a success in their case. The export from Greece is as in Argentina considerable small compared to Hong Kong. There cannot be put too much into this, as Hong Kong is an extreme case when it comes to openness, even if this might be the key to their currency board success. It cannot be stated on a general level that countries with lower openness than Hong Kong cannot successfully fix their currency, but the numbers give an indication of the economy in Greece being relatively closed. Greece is however more open than Argentina was in their currency board period, with export as percentage of GDP more than double the share in Argentina. An interesting point is that Argentina has become more

open after they ended the currency board. There is a clear jump in the export from when they gave up their currency board in 2001 to 2002. Whether a Greek eurozone exit would have the same effect would only be speculations, but the data shows that Greece had a higher export as percentage of GDP in the last years before it became a eurozone member. Meanwhile, it can be concluded that the implementation to the eurozone does not seem to have had any positive effects on the export.

Another way to measure the degree of openness is shown in Table 5.2. Here Greece's share of intra-union exports is compared to the other eurozone countries and the eurozone average.

Table 5. 2 Intra-union exports of goods, % of GDP, 2008-12

Year	Germany	Ireland	Spain	France	Italy	Greece	EU average
2008	25,2	36,4	12,2	13,8	13,8	5,0	21,8
2009	21,1	32,6	10,9	11,5	11,1	4,0	18,7
2010	23,1	41,9	12,5	12,4	12,5	4,5	20,7
2011	24,4	49,8	13,0	13,1	13,3	5,3	22,1
2012	24,9	49,5	13,5	12,4	13,7	6,0	22,3

Source: European Commission

In Table 5.2 Greece stands out as the country with the lowest degree of openness in terms of intra-union exports over the five years 2008-12. Cyprus is actually the only country in EU with a lower degree of openness than Greece in this period (European Commission, 2012). The degree of openness in Greece is also a great deal lower than the EU average which approximately lies on a rate four times higher than the rate in Greece. Since these data show that intra-EU trade is relatively unimportant in Greece, it is less clear that the country belongs to an optimal currency area with the rest of the EU than if the trade was important. The benefits of being in a monetary union are much smaller for a country with a small fraction of their goods being exported to other member countries than countries with a large fraction of intra-union export. With a small share of their trade being within the union they do not earn

the benefits connected to the elimination of costs that comes with the need to exchange currencies in cross-border transactions. They would naturally not have these benefits if they left the eurozone either, but in a cost/benefit analysis the lack of benefits will give the costs a larger weight. As previously mentioned, a small degree of openness to the EU means Greece is less integrated with the rest of the union, which means more likelihood of asymmetries, and more difficult to adjust to asymmetries. In addition, the degree of openness to the rest of the world has a direct impact on the economic situation in Greece. If there was an increase in Greece's exports, this could partially compensate for the contractionary impact of fiscal consolidation. If Greece would experience increased openness like Argentine did when they left their fixed exchange, this could be an argument of leaving the eurozone. With the low degree of openness in Greece it is more difficult for exports to provide an offset to the fiscal tightening. Alcidi & Gros (2012) states that if Greece had been able to increase the volume of its total exports similarly to that of Spain or Portugal, i.e. by around 3 percentage points in the period from 2008-12, this would have given a boost of around 5 percentage points to the country's GDP. This would not have been sufficient to offset the negative impact of fiscal consolidation, but it would still have provided some stabilization effect. Greece had a negative change in exports in this period (Alcidi & Gros, 2012).

5.1.3 Mobility and Flexibility

The degree of wage flexibility in Greece is measured through developments in quarterly percentage change in unemployment and wages. These are shown in Table 5.3.

Table 5. 3 Quarterly percentage change in unemployment and wages, 2009-12

TIME/GEO	Unemployment rate	Unemployment, % change to previous period	Wages and salaries, % change to previous period
2009Q1	8,9	11,25	-12,9
2009Q2	9,2	3,37	13,3
2009Q3	9,6	4,35	3,9
2009Q4	10,3	7,29	6,4
2010Q1	11,2	8,74	-10,2
2010Q2	12,0	7,14	0,1
2010Q3	12,9	7,50	-0,3
2010Q4	14,1	9,30	6,7
2011Q1	15,3	8,51	-11,5
2011Q2	16,7	9,15	4,0
2011Q3	18,3	9,58	-2,9
2011Q4	20,5	12,02	4,9
2012Q1	22,0	7,32	-15,8
2012Q2	23,8	8,18	7,0
2012Q3	25,4	6,72	-5,7

Source: Eurostat

There are no clear signs of a high negative correlation link between these two indicators as it would have been if there was high flexibility. The unemployment has risen each quarter since 2009, with some loops in the beginning of 2009 and the last quarter of 2011. If wages were flexible, there should be a negative development in wages in the periods after increases in unemployment. There are many periods with decreasing wages, especially in the first quarters of each year, but there are also quarters with quite high increases. An example is the fourth quarter in 2010 and the second quarter in 2012 where wages rose by 6.7 and 7.0 percent respectively compared to the quarter before. Looking at the whole period, there seem to be a low negative correlation, and overall the wages decrease and unemployment increases. However, the many periods with high increase in wages together with increasing unemployment indicates that the negative correlation is low. This means that the flexibility is low. Before discussing the result any further, the flexibility in prices will be presented in

Table 5.4. The table shows a comparison of the quarterly percentage change in inflation and prices.

Table 5. 4 Quarterly percentage change in wages and CPI, 2009-11

TIME/GEO	Wages and salaries, % change to previous period	CPI incex, 2000=100	CPI index, % change to
2009Q1	-12,9	126,3	-2,40
2009Q2	13,3	133,6	5,78
2009Q3	3,9	131,3	-1,72
2009Q4	6,4	135,4	3,12
2010Q1	-10,2	130,6	-3,55
2010Q2	0,1	132,3	1,30
2010Q3	-0,3	134,6	1,74
2010Q4	6,7	135,5	0,67
2011Q1	-11,5	131,7	-2,80
2011Q2	4,0	134,6	2,20
2011Q3	-2,9	134,7	0,07
2011Q4	4,9	137,6	2,15
2012Q1	-15,8	132,2	-3,92
2012Q2	7,0	133,3	0,83
2012Q3	-5,7	134,0	0,53

Source: Eurostat

There does not seem to be any strong correlation between wages and inflation, but there is a higher correlation than between unemployment and wages. If prices were flexible they would adjust in the same direction as wages, if not right away, then at least within a year. In the first quarter of each year, wages decrease between 10 and 15 percent compared to the quarter before. This tendency could also be seen in the CPI rate, where the rates clearly decline the same quarter. These movements indicate that the prices adjust right away, but if that is the case, they should adjust the other quarters as well. Besides from the movements in the first quarters each year the prices do not seem to correlate with the movement in the wages. Sometimes the wages increases while the prices decrease, and the other way around. It is

difficult to conclude on anything specific in this case, but it is clear that the data do not show any high correlation between prices and wages. Hence, there is not any clear indication of price flexibility or of wage-price inflation.

When it comes to labor mobility, this is discussed by looking at the change in the unemployment rates in relation to net migration presented in Table 5.5.

Table 5. 5 Changes in unemployment and net migration, 2001-11

	Unemployment rate	Crude rate on net migration
2001	10,7	3,5
2002	10,3	3,5
2003	9,7	3,2
2004	10,5	3,7
2005	9,9	3,6
2006	8,9	3,6
2007	8,3	3,6
2008	7,7	3,1
2009	9,5	3,1
2010	12,6	-0,1
2011	17,7	-1,3

Source: Eurostat

There has been a relatively stable positive net migration in Greece in the years after the eurozone inclusion and up until the consequences of the recession started to become visible in 2009. The unemployment rate has been fairly stable. In 2010 the unemployment rate started to increase, and the net migration sank to just below zero, which means more people moved out of Greece than people moved in. This could be a coincident, but the same trend can be seen in 2011. The unemployment had increased to more than double the 2008-rate, and the net migration decreased to -1.3. Thus, there is a clear negative correlation between the data, which indicates that there is some labor mobility between Greece and the rest of the EU.

To sum up, there are no strong indications of wage- and price flexibility, but there seem to be some labor mobility in Greece. With flexible labor markets, one could have expected rising unemployment to result in a decline in wages. This would mean cheaper labor for companies, and a more competitive industry. However, the observable labor mobility in Greece does not seem to be strong enough when prices and wages are rigid. The unemployment keeps increasing. Krugman and Obstfeld (2006) stated that differences in culture and language in Europe results in greater barriers to mobility across European borders than between states in the United States. They also argued that the low mobility within Europe is due to government regulations. The lack of wage and price flexibility is a disadvantage that points in the direction of Greece not being in an optimal currency area with the rest of the eurozone, and that the country experiences more problems in adjusting to asymmetric shocks than countries with higher flexibility in the labor markets. Labor markets in Argentina were also fairly inflexible during the currency board era. The unemployment rate in the country went from 5.8 percent in 1991 to 18.8 percent in 1995. From this year it stayed around this level until the currency board was ended in 2001. In December 2002, the country reached an all time high, with a rate on 20.8 percent. However, in the following years, the unemployment rate in Argentina have steady decreased, and in the end of 2012, the rate was below 7 percent (Trading Economics, 2013). Frank (2004-05) argues that the labor market setting in Argentina resulted in significant and growing unemployment throughout the 1990s. Together with the Brazilian currency depreciating against the Argentine Peso, the rigid labor market became an ever growing problem. He further states that adjustments in the wage level would have assured the competitiveness of the Argentine economy, and that the inability to enforce labor market reforms must be regarded as one of the main factors that ultimately led to the collapse of the currency board. The following question is thereby whether or not a labor market reform will be more likely to occur within the monetary union or whether Greece can manage this

better as a non-eurozone EU member. This is a difficult question to answer. One could argue that the same could happen in Greece as it has done in Argentina, but it is important to remember that Greece has a tremendously higher debt and budget deficit level than Argentina had. Even if Greece leaves the eurozone, there still needs to be austerity measures which would make economic growth difficult. However, the country would get their own currency back, which could have helped their competitiveness. Drawing on evidence assembled in the context of the OECD Jobs Strategy, Duval and Elmeskov (2006) observed that on average, the intensity of structural reforms over 1994-2004 were greater in the eurozone than in the rest of the OECD. The top reforming countries were small eurozone countries. Reforms were also typically deeper while at the same time more comprehensive in the eurozone. However, reform intensity was not greater in the eurozone than in non-eurozone EU countries. Furthermore, the advent of the eurozone did not coincide with an acceleration of reforms: intensity was lower in the period 1999-2004, compared with 1994-98. No such slowdown was observed in non-eurozone EU countries. Finally, there is evidence that reform patterns have been less responsive to needs for reform in the eurozone than in other OECD countries. This does not mean that a labor market reform in Greece is more likely to occur if the country leaves the eurozone, but it does indicate that the chances of a reform are at least as high as a non-eurozone EU country.

5.1.3 Asymmetry of shocks

Korhonen and Fidrmuc (2001) did an exercise where they presented the correlation coefficient of demand shocks and supply shocks, with the average demand respectively supply shocks in the eurozone. The result is presented in Figure 5.1.

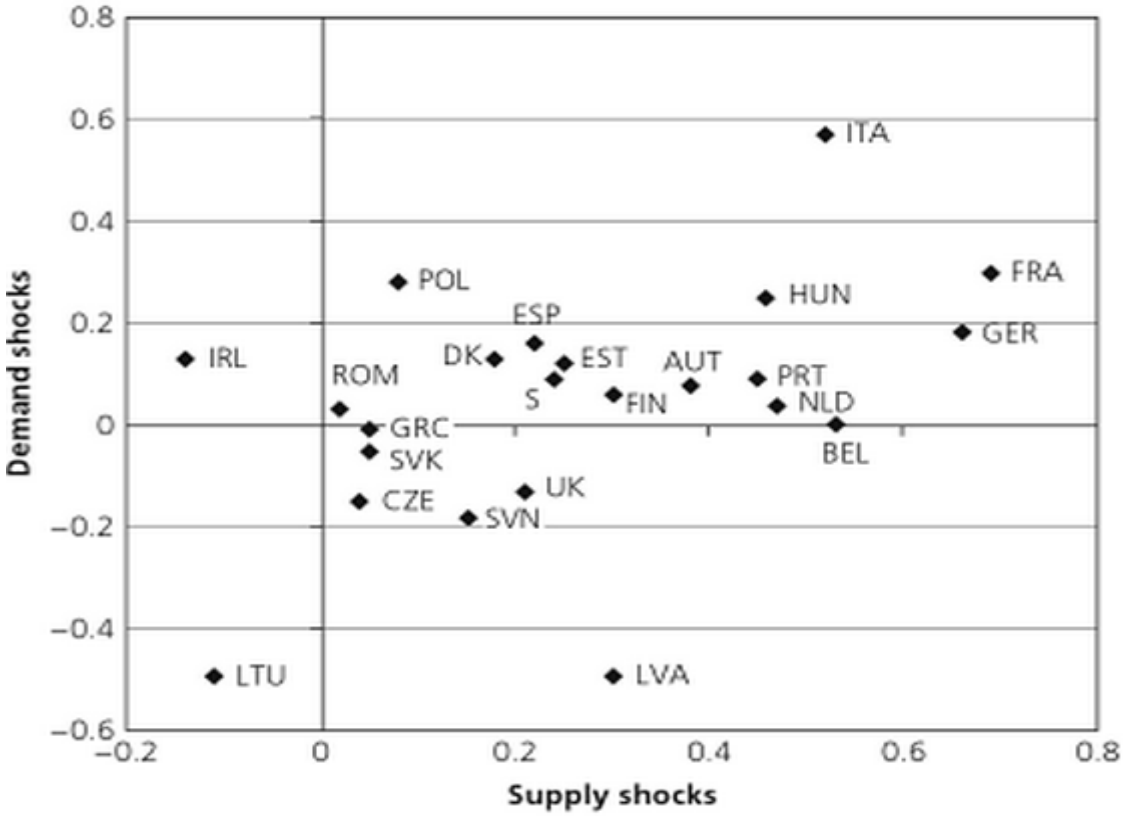

Figure 5. 1 Correlation of demand and supply shocks within the eurozone

Source: Grauwe, 2009

The large countries France, Germany and Italy have relatively high correlation of the supply shocks with the euro area. Greece on the other hand, has a rather low correlation with the rest of the eurozone. The correlation of demand shocks is actually negative according to this exercise. But more importantly, the correlations of supply shocks, which are unlikely to disappear in a monetary union, are below 0.1. This low correlation means Greece is likely to experience asymmetric shocks with the rest of the eurozone, which means they probably find the interest rate decision of the ECB to be inappropriate to deal with the economic situation of the moment. As a result, the perceived cists of the union will increase relative to the perceived benefits of the single currency. The only way to deal with asymmetric developments in a monetary union is to make sure that individual member countries have the right instruments.

In this context, progress toward reforms of the labor markets aimed at making these more flexible is of great importance.

The financial crisis in 2007 was not an asymmetric shock, but an external shock with asymmetric effects in the eurozone. The macroeconomic indicators presented in chapter 2 shows divergence in the macroeconomic indicators in Greece compared to the other member countries after 2007. The budget deficits increased drastically, it tripled from 2007 to 2010. The government debt started accumulating, and it accelerated from the debt levels in other eurozone countries. From an amount of around 100 percent of GDP in 2007, it exceeded 170 percent in 2012. Another indicator that showed divergence from the other member countries was Greece's Maastricht bond yield, which increased from below 5 percent in 2007 to above 22.5 percent in 2012. This was more than twice the yield in Portugal that had the second highest yield in 2012. The unemployment rate in Greece also started to increase after 2007. This happened in many of the other eurozone countries as well, but the growth was more rapid in Greece. Spain had the highest unemployment rate in 2009, 2010 and 2011, but in 2012 Greece reached a record high rate at approximately 26 percent. The clear divergence in these macroeconomic indicators stress the economic hardship Greece has experienced after the recession stroke, and is one of the keys when discussing their future as a eurozone country. Some of the indicators are also affected by the austerity demanded in return for the bailout packages, but they are also a result of the fiscal policy that has been implemented in Greece. This will be further discussed below, and must be seen as one of the main reasons for the large asymmetric effects of the recession.

5.1.4 Fiscal policy

As previously mentioned, Greece has a history of running budget deficit and accumulating debt. In Argentina the government ran an ever growing budget deficit, and rapidly increased its debt load. While Argentina increased its external debt, Greece has had large amounts of

government debt. Argentina's fiscal policy has been pointed out as one of the main reasons for collapse of the currency board. Greece has run an irresponsible fiscal policy for years, they have especially spent beyond their means in the public sector and pension systems. The high level of debt has been a concern in Greece, and did cause some troubles when the country tried to join the eurozone the first time, but it has not been a major problem in modern times. It was first when the recession stroke that the many years of running a fiscal policy like this gave results through a rapidly growing budget deficit and an accumulating debt load showed in Table 2.1. When the debt started accumulating and the deficit started growing, the international investors began losing confidence in the Greek government's ability to keep the debt under control. The interest rates increased, which increased the cost of refinancing the debt. This is an ever growing circle. More debt leads to less confidence, which results in higher interest rates, that again results in increased cost of refinancing debt. In this way, a growing market concern has a self-fulfilling effect. Now the fiscal policy has been changed, and the country has been forced to implement many rounds of austerity measures.

5.1.5 Fiscal Mechanism

In the European Union, the member states maintain most of their budgetary powers. The operation of the EU has an agreed budget of €141 billion for the year 2011, and €862 billion for the period 2007–2013, this represents around 1% of the EU's GDP. The national budgets typically absorb 40 to 50 percent of GDP. By using the mean value, 45 percent, as complete centralization, the multiplier from chapter 4 is:

$$100/0.45=222.22 \quad (5)$$

The degree of centralization is

$$0.01*222.22=2.22 \quad (6)$$

On the scale presented in the framework, this means the EU represents an almost complete decentralized budgetary system. This creates the possibility that large asymmetric shocks may occur in the Union without the automatic transfers to smooth out the differences. The situation in the eurozone would be easier with more political integration which would make it possible to centralize a significant part of national budgets at the level of the union. Today spending and taxation in the eurozone remain in the hands of national governments and parliaments. As a result, unilateral decisions to lower (or increase) taxes can create an asymmetric shock. Similarly, social security and wage policies are decided at the national level. Wage bargaining systems, for instance, differ widely between countries, creating the possibility of asymmetric disturbances. Decisions like cutting the working week in one of the countries in the eurozone, which has obvious implications for the eurozone as a whole, should be a matter of common concern, and should not be allowed to be decided by individual countries without consultation with other member countries. Similarly, national wage policies will have to be coordinated to avoid asymmetric developments in competitive positions of the member countries. In addition, differences in legal systems and customs generate significant differences in the workings of financial markets. These differences also lead to divergent effects of the same interest rate shocks. From this perspective it can be argued that the eurozone can only function satisfactorily if further steps towards political unification are taken, and that there needs to be one budgetary power for the whole area, and not a national budgetary power in each country.

5.1.6 Inflation and growth

Stability in inflation was one of the main reasons for Argentina to start a currency board regime, and according to Grauwe (2009) one of the reasons why Greece joined the eurozone. Greece did not pursue any inflation target before they started the process of being a eurozone member, but followed other macroeconomic objectives. In the 1980s the government drove

and expansionary policy that led to an inflation rate as high as 25 percent. In Table 2.1 it is clear that Greece stabilized their inflation towards their entrance in the eurozone. After having a CPI of 20 percent in 1990, the index was stabilized bit by bit each year until it reached a level of 2 percent in 1999. Although the inflation was stabilized after the country became a eurozone member, the CPI index has been approximately above 3 percent each year, which is above the target of just below 2 percent, and also above the fluctuation of ± 1 percent from the inflation target. In the years after the recession the fluctuations have been even larger. These data indicate that Greece has an unstable inflation, even though the country is a monetary union member. Compared to the situation in the early 1990s, the rate has been stabilized, but this was done in a process during the 1990s, and not after the entrance to the eurozone. This might imply that the country is able to stabilize their inflation on their own, and that they do not benefit from the eurozone with respect to the inflation.

When it comes to Greece's growth rate in terms the average yearly growth rates of GDP compared to the eurozone, this is shown in Table 5.6.

Table 5. 6 Average yearly growth rates of GDP in the eurozone 1996-2012

Area	%
Eurozone	1,04
Germany	1,32
Ireland	3,04
Greece	0,72
Spain	1,26
France	0,89
Italy	0,18
Belgium	1,13
Estonia	5,24
Cyprus	0,48
Luxembourg	1,70
Netherlands	1,34
Austria	1,58
Portugal	0,87
Slovenia	2,26
Slovakia	3,88
Finlnad	2,07

Source: Eurostat

The data shows that the average GDP growth in the eurozone over the period has been 1.04 percent. There are large fluctuations between the different member countries, with Estonia on the highest rate of 5.24 in the period. The country with the lowest growth rate is Italy. The growth rate in Greece has been 0.72, which is the third lowest rate of all the member countries. This means that Greece is not one of the countries that grows faster than others, and that they do not experience any trade balance problems where imports tend to grow faster than exports. This can be seen in Table 5.7 where Greece's total exports are shown in proportion to the total imports in the same period as the GDP growth rate in Table 5.6.

Table 5. 7 Export in proportion to import in Greece, 1996 - 2012

Year	Imports of goods and services (% of GDP)	Exports of goods and services (% of GDP)	Export/ import
1996	28	18	0,64
1997	30	20	0,67
1998	31	20	0,65
1999	34	23	0,68
2000	40	26	0,65
2001	38	25	0,66
2002	36	22	0,61
2003	33	21	0,64
2004	33	23	0,70
2005	32	23	0,72
2006	35	23	0,66
2007	38	24	0,63
2008	39	24	0,62
2009	31	19	0,61
2010	32	22	0,69
2011	33	25	0,76

Source: The World Bank

Table 5.7 shows that the relationship between Greece's imports and exports has been fairly stable in the period. There are some fluctuations in the rate in the years after Greece became a member of the eurozone, but these are both increasing and decreasing compared to the period before they got included. This means that there is no clear indication of a change in the relationship because of the eurozone membership, which supports the statement of Greece not having any costs of being in a monetary union with respect to growth rates.

5.1.7 Macroeconomic development after first bailout package

The developments in the macroeconomic indicators in Greece after they received their first bailout package in 2010 can give a picture of the effects the package has had. There cannot be drawn any clear conclusion as there are only a couple years of development to explore. The development should however give a good indication of the effects. There were primarily three targets when granting Greece the package. First, the intention was to prevent Greece from

defaulting on their debt. Second, prevent contagion, and third, reducing public deficit to less than 3 percent of GDP by 2014. The developments in the macroeconomic indicators were both positive and negative.

The GDP growth rate was negative in 2010, and decreased further in 2011. In 2012 the rate was still negative, and still worse than in 2010, but better than in 2011. That the country did not experience any growth, only a shrink in the economy, is not very surprising. Austerity measures tighten the economy, but are demanded of Greece to lead to recovery for the economy. In other words austerity, which deals only with the symptoms rather than the causes, must somehow fix all the structural flaws of a collapsing edifice, ironically by putting more pressure on it, thus accelerating its destruction. Cuts in public spending can have large effects on the economy, especially in long term. Public spending includes taxes, use of revenues from public fortune and business management, borrowing in the financial markets and borrowing in the central bank. Higher taxes will naturally mean less money to the people, as they would have to give a larger part of their revenues to the government. As mentioned earlier, Greece struggles with undeclared work. For these people higher taxes will not have an impact on their money holdings. But higher taxes could mean that undeclared work will be an even bigger problem, because more people would want to avoid paying taxes. The austerity demanded from the EU and the International Monetary Fund has meant cuts in public spending, and this has not helped the reliance between the people and the government. For the people who are paying taxes, their holdings will lessen, and they will have to cut their own spending. This could lead to the "snowball-effect" described earlier with increasing unemployment. This is supported by the unemployment rates in Greece which accelerated after the bailout package with the following austerity measures were received in 2010. From a rate of 12 percent in 2010, the unemployment in Greece reached 26 percent in October 2012. That means more than 1 in 4 people in Greece do not have a job. High unemployment leads to

considerable losses in the domestic product and a lower standard of living. Long-term unemployment also means a loss of employment skills and competence. The unemployment in Greece is an example of cyclical unemployment on top of a fairly high structural unemployment which applies for the European Union as a whole for the last 20 years. The high increase in real wages is one of the reasons for the high structural unemployment in the EU (Steigum, 2004). But the unemployment rate in Greece is higher than in the other countries in the Union, and can partly be seen as a result of the austerity in times with acute depression. A country in this situation, would want to lead an expansive financial policy, by either increasing public spending or reducing taxes. What Greece's government has been forced to do is the exact opposite.

In addition to the higher taxes, the government had to make cuts in their government budget. They had to cut wages for the public employees, cut their retirement pension and also resign many of the staff in the public sector. According to TV2 news (TV2 nyheter, 2011) Greece's public sector has had many fringe benefits. For instance, employees have gotten a bonus for showing up at work on time and foresters have received a bonus for working outside. This kind of practice has ended. The changes have led to increasing displeasure with the government and political instability. This has, together with increasing unemployment and higher taxes, led to fear and concerns in the banking system market. The fear of Greece defaulting on their debt has disturbed investors and people who held money in Greek banks. It has caused them to lower their valuation of the assets in the country and lose faith in its economic strength. In the first half of 2012 there was a growing uncertainty as to whether Greece could keep the euro or had to return to their old exchange in the wake of the election in June. Savers where concerned over the failure of political leaders to form a coalition government and the prospect of an inconclusive election. All these factors led to large capital flight from the country, especially in 2012, when the capital flight was of such a size that

economists was afraid Greece would be forced out of the eurozone before the important summer elections. This kind of insecurity has a self-fulfilling effect, since the capital flight only make the economic situation worse.

One indicator that shows a positive development after the receipt of the first bailout package is the general government deficit. This was as high as 15 percent of GDP in 2009, but after receiving the bailout package it decreased to 10 percent in 2010, and further down to 9.4 percent in 2011. It is worth noticing that the decline from 2010 to 2011 is small, considering that the goal is to have a deficit less than 3 percent of GDP by 2014. The Greek government is however positive to reaching the target, and pronounced in February 2013 that they actually expected a surplus in 2014 (Reuters, 2013). When it comes to their general government gross debt this started to accumulate already in 2007. What is interesting with respect to the bailout packages is that the debt level was almost 150 percent of GDP in 2010, and after the bailout package was provided that year, the debt actually kept increasing. In 2011 it was on 170 percent of GDP. The rapid growth did however diminish in 2012, and peaked at 175 percent. This could partially be a result of the lenders of Greek debt cutting interest rates on Greece's already existing loans, but also a result of reluctance of borrowing more money to Greece in the market.

Moving to the inflation rate, it is hard to draw any conclusion out of the last year's development. The rate was 4.7 percent in 2010, a little lower in 2011 with 3.3 percent, while it was a fairly small 1.5 percent in 2012. It is a little surprising that the inflation grew this much in 2010 and 2011. With the tough austerity measures, higher unemployment and cuts in public spending, one would not expect prices to rise this much, especially not above twice the preferred rate. This could be a result of the rigid prices that seem to be the case in Greece.

The Maastricht bond yield gives a clear indication that the bailout package in 2010 has not given the market any more faith in the Greek economy. From 9 percent in 2010 it increased to almost 16 percent in 2011 and above 22 percent in 2012. There was a hope that the aid would help restore faith in the market, and calm the growing fears, but the development in this yield shows that this did not happen.

5.2 Summary and discussion

The chosen indicators of costs and benefits of Greece being part of the eurozone point in the direction of Greece not forming an optimal currency area with the rest of the member countries. With that in mind it is interesting to analyze the similarities between the situation in Argentina and Hong Kong compared to the situation in Greece. Argentina still had their own currency when they implemented a currency board with the US, but it was tied to the dollar the same way Greece have the euro tied 1:1 to the rest of the monetary union. As in Greece, they increased their debt load after fixing their currency, and were forced to reduce their budget deficit. This problem was made worse when neighbor countries were hit by a recession. The situation was in other words quite similar to the situation in Greece with the recession that stroke in 2007. In both countries a recession with origin in another country led to an increase in budget deficits. Both countries also experienced fears and doubts about the ability of the government to service its debts, which depressed the financial markets and further deepened the recession. Neither country had the possibility of using monetary policy as a tool to improve the situation, nor did they fulfill the necessary characteristics discussed above to be able to adjust without using the exchange rate. The solution was to use financial policy to increase taxes. In Argentina this only raised criticism of the fix to the dollar and that the fix played a role in bringing about the recession. Eventually the concern of a devaluation

of the peso came to the surface. The situation is undeniable very similar to the situation in Greece. When it comes to similarities with Hong Kong, there are not so many of these as with Argentina. The US is a major trading partner of Hong Kong, and this is one of the features that distinguish the Hong Kong currency board from the fixes in Argentina and Greece. Another distinction is that Hong Kong is characterized by high degree of openness, which as previously mentioned is not the case in Greece. Also, Hong Kong is a highly externally oriented economy that works hard to have a strong link to the international community.

When it comes to the analysis of whether Greece has more costs than benefits of staying in the eurozone, the answer is complicated, but there can be drawn some acknowledge from what happened in Argentina. The divergence in macroeconomic indicators after the recession stroke may be a result of Greece being in a monetary union without the necessary characteristics to benefit from it. The asymmetric effects can mainly be connected to three characteristics; Greece's flexibility, openness and fiscal policy. These three characteristics have also been pointed out as the main reasons for the collapse of Argentina's currency board. With budget deficits and large amounts of government debt, the financial crisis in 2007 led to imbalances in Greece that needed adjustment. These adjustments did not happen, most likely because the country is relatively closed and not sufficient integrated with other member countries, and because the labor markets are not flexible enough. The indicators discussed in this section indicate that Greece in many ways is not in an optimal currency area with the rest of the eurozone countries, and that the country would probably had been better off not being a member of the eurozone when the recession stroke Europe. However, the reality is that Greece was a eurozone member at the time, and even though this might have resulted in the recession hitting them this hard, there cannot be proven that leaving the eurozone at this point will help the situation. One point is the budget deficits and government debt. If Greece leaves the eurozone, the country would most likely reviving its traditional currency, the drachma.

With the drachma back, salaries and prices within Greece would be converted from euro to drachma, and to make the Greek economy more competitive the drachma would be allowed to depreciate. This is however where the problems would start, especially with debts that are denominated in euro. If lenders are outside of Greece, they would naturally resist being repaid with less valuable drachmas. If Greek borrowers have to repay the loans with euro, the debt would become more expensive for them to pay off after the drachma is devalued. Another point to the discussion is the unemployment. The unemployment rate for the youth under 25 is around 60 percent. The problem is that even though Greece would leave the eurozone, there is no prove that the unemployment will improved. One could say that since Argentine got their employment back on a healthy level after leaving the currency board the same could happen in Greece. However, a massive devaluation of the new currency would lead to inflation, decline in domestic demand, and unemployment would be likely rise even further. Michael Arghyrou, a senior economics lecturer at Cardiff Business School, has stated that the drachma would be devalued by 50 percent, causing inflation. He believes interest rates will have to double and all mortgages, business loans and other borrowing will become much more expensive. In addition he states that there will be no credit for Greek banks or the Greek state. That could mean a shortage of basic commodities, like oil or medicine or even foodstuffs. A lot of Greek firms rely on foreign suppliers, who may cut off Greek customers. Greek companies could be driven out of business. To sum up his statement, a Greek exit would lead to a deeper economic breakdown and higher unemployment (BBC News, 2012). Another side of the story is the long term effects of staying in the eurozone. Considering the lack of necessary characteristics and Greece's history of fiscal policy, what would happen if a new global financial crisis hits? Given that nothing changes, they would probably end up in the same situation. If they ought to stay in the eurozone, there need to be done some changes to prevent a new recession, both by Greece and the eurozone.

Another interesting side of the discussion is whether it even is possible for Greece to stay in the eurozone. The development in the macroeconomic indicators in Greece after they received the first bailout package, together with the fact that there has been given out many more bailout packages in the eurozone area afterwards, points in the direction of the actions taken to solve the crises not being effective. Given the indicators discussed above, the long-term effects of the bailouts do not look to good either. The new package to Greece might seem as a way to postpone the inevitable. Among other factors, it included Greece's partial default. By agreeing on a default one of the main targets of the first package was failed. In addition, the bailouts of Ireland, Spain and Portugal have shown that the second target of the first package has also failed, there has been contagion. The fact that the targets and time limits in the first package have been adjusted several times when it has become clear that Greece would not be able to meet them, and that there had to come another bailout package after just two years, indicates that the actions taken have not had the effect as hoped.

This is also the case in the whole South Europe. Even though Greece has experienced the deepest recession of the eurozone countries, they are not alone. Large economies as Spain and Italia have struggled for some years, and now France is sinking deeper down in the recession. Some argue that the actions taken to solve the crisis in the eurozone have only made things worse. The IMF has admitted that they underestimated the negative effects of the austerity they have demanded of the countries in trouble (Bloomberg, 2013). It has also been revealed that two world famous economists, Kenneth Roghoff and Carmen Reinhart, have done incorrect calculations regarding economic growth of a decline in debt. Their calculations have been used by the European Commission to defend austerity measures in countries with high debt (Financial Post, 2013). It can be argued that the countries in the eurozone are too dissimilar, and that they might have jumped into a monetary union to early. The lack of a fiscal mechanism that can provide automatic adjustments is in my point of view a weakness of

the union. A more centralized budget and a step closer towards a political union, like the US, would have secured a more cooperative fiscal policy and have stabilizing effects in the eurozone. Deutsche Bank's global head of FX strategy, Bilal Hafeez, compared the eurozone with a troubled teenager in a speech in March:

> "Who else has entered the terrible teens? The Euro-Area! It was born in 1999, and so is currently fourteen years old. It has all the hallmarks of teenage angst. It is ridden with internal conflicts, it is groping around for structure, and it is suspicious of authority."
>
> (businessinsider.com, 2013)

It seems that there is no easy or good solution to the financial crisis in Greece. The indicators above tell us that the country most likely has more costs of being a eurozone member than benefits, but with the recession ravaging they do not have any good alternatives. In addition, the eurozone itself does not know how to solve the crisis, and the contagion is still ravaging, more than four years after the recession set in.

Chapter 6 Conclusions and suggestions for future work

This thesis has discussed whether Greece should stay or leave the eurozone with respect to the costs and benefits being a eurozone member. It has studied the theory of optimum currency areas and the history of Greece and the eurozone. A broad theoretical discussion and historical context of the fragility of incomplete monetary unions, with examples from the earlier currency board of Argentina and the current currency board of Hong Kong, has been presented to draw a comparison with the situation in Greece.

The background of Greece's political history has shown that there has been decades of excessive spending. In addition to accumulating government debt and running budget deficits, the country also cheated on their numbers to achieve a eurozone membership. When Greece became a eurozone member in 2001 it got easier for the country to borrow money, and when the recession began in 2007, the country's weak economy became evident. The macroeconomic indicators in Greece shows a divergence from the other eurozone countries after 2007, the country is now in a deep recession.

Through a discussion of in which grade Greece fulfill the necessary characteristics for an optimal currency area and experience from earlier currency boards, the costs and benefits of Greece being a eurozone member has been analyzed. The conclusion is that Greece does not seem to have the necessary characteristics to net benefit from being a eurozone member. The country is relatively closed, does not seem to have flexible wages or prices, and the mobility of labor cannot proven to be strong. In addition they seem to be exposed to asymmetric shocks in a large degree compared to the rest of the eurozone, and the effects of an external shock has proven to be asymmetric through the financial crisis in 2007. The cost of not being able to use their own monetary policy in this situation is according to the analysis in this thesis larger than the benefits Greece has of being a eurozone member.

Within the eurozone, goods, services and people can move freely, and the national frontiers are eliminated. This would indicate a high degree of flexibility in the factor market and a high degree of openness. This would help Greece adjust to changes in the economy without the ability to use monetary policy. This does however not seem to be the case in Greece, where the unemployment rate has increased each year since 2007, prices are rigid and the share of intra-union export is low.

The eurozone have a fiscal stabilizing mechanism called EFM, which is a lending facility set to provide support for countries that need economic aid. However, there is no automatic fiscal stabilization that provides transfers between the countries in the eurozone. The result is, as in Greece, that countries in economic trouble get bailout packages. This means they mainly get loans that are supposed to be paid back; hence, they increase their debt. In addition the countries have to impose austerity measures which further tighten the economy. This has become evident in Greece through accumulated debt and unemployment rates reaching record high levels after the bailouts were handed out.

The economic situation in Greece has significant similarities with the situation in Argentina the last years of their currency board. Both countries experienced increasing government debt and ran budget deficits, although Argentina's debt was mainly external debt while Greece has accumulated government debt. In addition Greece's debt burden and budget deficits are roughly three times larger than that in Argentina. Both countries have low degree of openness and have received many different kinds of economic aid. In addition, both countries suffered under doubts and fears in the market, which tend to have a self fulfilling effect. Even though Greece did not leave the eurozone in 2012 as many economists thought, there are still much insecurity and doubts about the government's ability to service their debt. Argentina eventually had to surrender their fix to the dollar after many attempts of saving the currency board.

With all these arguments of why Greece does not benefit from being a eurozone member, why has the country not left the monetary union yet? The problem is that Greece is in a deep sovereign government debt crisis. This will not disappear if they leave the eurozone either. They still have to pay back large amounts of debt, and still have to impose austerity measures. In addition, they will probably lose the access to financing from the ECB, and because of their small size and openness they risk not being considered important enough to save. This thesis conclusion is that Greece should not have been part of the eurozone in the first place, but with the situation they experience now, the best option is to stay within the monetary union. The leaders of the EU will do everything in their powers to save Greece as an exit could have tremendous effects in terms of a weakened euro, uncertainty in the market and contagion to other member countries. However, if Greece's economy continues to contract sharply, the country may not be able to cut its overspending as much as planned, and they might ultimately be unable to pay back their debt. In that case, Greece's future will depend on how long the rest of Europe is willing to provide help before they force them to leave the eurozone. The aid provided so far has not been proven effective, and if this does not turn it is only a matter of time before Greece will be forced out of the eurozone.

There are many limitations of this conclusion. The analysis only considers Greece's perspective. For future work, the EU's costs of both keeping and forcing Greece out of the eurozone should be analyzed. There should in addition be explored what can be done to prevent a new recession from striking Greece this hard, given that they are not forced out of the eurozone. A broader analyze of what would happen in Greece if they were to leave the eurozone, should also be explored.

References

Alcidi, C., & Gros, D. (2012). "Why is the Greek economy collapsing? A simple tale of high multipliers and low exports". *Ceps Commentary* , 1-5.

Appleyard, D. R., Field jr, A. J., & Cobb, S. L. (2010). *"International economics"*. New York: McGraw-Hill/Irwin.

BBC News. (2012, 02 24). *"A point of view: Making friends tha shared currency way"*. Retrieved 02 21, 2013, from www.bbc.co.uk: http://www.bbc.co.uk/news/magazine-17140379

BBC News. (2012, 11 27). *"Eurozone crisis explained"*. Retrieved 01 07, 2013, from www.bbc.co.uk: http://www.bbc.co.uk/news/business-13798000

BBC News. (2001, 01 01). *"Greece joins eurozone"*. Retrieved 02 11, 2013, from news.bbc.co.uk: http://news.bbc.co.uk/2/hi/business/1095783.stm

BBC News. (2013, 01 10). *"Greece unemployment hits highest rate in European Union"*. Retrieved 01 22, 1013, from www.bbc.co.uk: http://www.bbc.co.uk/news/business-20968845

BBC News. (2010, 03 22). *"Greek economy 'to worsen' in 2010 says central bank"*. Retrieved 01 07, 2013, from news.bbc.co.uk: http://news.bbc.co.uk/2/hi/business/8580284.stm

BBC News. (2012, 06 13). *"Timeline: The unfolding eurozone crisis"*. Retrieved 02 19, 2013, from www.bbc.co.uk: http://www.bbc.co.uk/news/business-13856580

BBC News. (2012, 07 13). *"Viewpoints: What if Greece exits euro?"*. Retrieved 04 23, 2013, from www.bbc.co.uk: http://www.bbc.co.uk/news/business-18057232

Bertola, G., & Drazen, A. (1993). "Trigger Points and Budget Cuts: Explaining the Effects of Fiscal Austerity". *American Economic Review* , 11-26.

Bleaney, M. (2004). "Argentina's Currency Board Collapse: Weak Policy or Bad Luck?". *The World Economy* , 699-714.

Blejer, M. (2012, 05 21). *"Greece must not follow Argentine example"*. Retrieved 03 18, 2013, from www.ft.com: http://www.ft.com/intl/cms/s/0/d1b420d6-a32e-11e1-8f34-00144feabdc0.html#axzz2NsVhmVyS

Bloomberg. (2013, 01 04). *"IMF officials: We were wrong about austerity"*. Retrieved 04 28, 2013, from www.aftenposten.no: http://www.bloomberg.com/news/2013-01-04/imf-officials-we-were-wrong-about-austerity.html

businessinsider.com. (2013, 03 14). *"Only Jesus Can Save The Euro*. Retrieved 05 01, 2013, from www.businessinsider.com: http://www.businessinsider.com/only-jesus-can-save-the-euro-area-2013-3

Chiu, P. (2001). *"Hong Kong's Experience in Operating the Currency Board System".* IMF: Hong Kong Monetary Authority.

Chown, J. (2003). *"A hoistory of monetary unions"*. New York: Routledge.

CNBC. (2012, 08 15). *"Greece to Exit Euro Zone Next Month?"*. Retrieved 03 18, 2013, from www.cnbc.com: http://www.cnbc.com/id/48671308

Crozier, D. (2011, 11 2011). *"Who chased whom how many times around what?"*. Retrieved 03 08, 2013, from www.navigatorfp.com: http://www.navigatorfp.com/comment.php?d=27

Daily Mail. (2012, 05 24). *"Greece WILL leave the eurozone on January 1, 2013': Citigroup boss predicts exit date and warns of 'massive wave of contagion across Europe"*. Retrieved 03 18, 2013, from www.dailymail.co.uk: http://www.dailymail.co.uk/news/article-2149193/Greece-WILL-leave-eurozone-January-1-2013-Citigroup-boss-predicts-exit-date-warns-massive-wave-contagion-Europe.html

Der Spiegel. (2012, 08 08). *"Printing Money: The European Central Bank's Discreet Help for Greece"*. Retrieved 03 18, 2013, from www.spiegel.de: http://www.spiegel.de/international/europe/ecb-prints-money-for-greece-to-buy-time-for-athens-a-848989.html

Duval, R., & Elmeskov, J. (2006). "The Effects of EMU on Structural Reforms in Labour and ". *What Effects is EMU Having on the Euro Area and its Member* (pp. 1-36). Frankfurt: The European Central Bank.

EC Commission. (1990). "One Market, One Money". *European Economy* , 44.

Economic History Association. (2010, 02 01). *"Monetary Union"*. Retrieved 02 04, 2013, from eh.net: http://eh.net/encyclopedia/article/cohen.monetary.unions

Eurofound. (2011, 01 13). *"Economic and monetary union*. Retrieved 02 02, 2013, from www.eurofound.europa.eu: http://www.eurofound.europa.eu/areas/industrialrelations/dictionary/definitions/economicandmonetaryunion.htm

European Commision. (2013, 02 13). *"Financial assistance to Greece"*. Retrieved 02 23, 2013, from ec.europa.eu: http://ec.europa.eu/economy_finance/assistance_eu_ms/greek_loan_facility/index_en.htm

European Commision. (2013, 01 13). *"General government deficit/surplus"*. Retrieved 01 29, 2013, from Eurostat: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00127&plugin=0

European Commision. (2002, 08). *"How the EU's single markets affects you"*. Retrieved 02 05, 2013, from www.ec.europa.eu: http://ec.europa.eu/publications/booklets/move/35/en.pdf

European Commision. (2004, 12 01). *"Report on the accountability issue"*. Retrieved 01 29, 2013, from eur-lex.europa.eu: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2004:0784:FIN:EN:PDF

European Commission. (2012). *"Statistical Annex of European Economy"*. Economic and Financial Affairs.

European Commission. (2011, 01 14). *"Why the euro"*. Retrieved 02 05, 2013, from ec.europa.eu: http://ec.europa.eu/economy_finance/euro/why/index_en.htm

European Commission, Regional Policy. (2008, 02). "European Union, Regional Focus". *"Labour mobility between the regions "* , p. 8.

Eurostat. (2013). *"Europan Commission, Eurostat"*. Retrieved 02 27, 2013, from Eurostat: http://epp.eurostat.ec.europa.eu/portal/page/portal/product_results/advanced_search

Eurostat. (2004, 11 22). *"Report by Eurostat on the revision of the Greek government deficit and debt figures"*. Retrieved 02 04, 2013, from epp.eurostat.ec.europa.eu: http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/GREECE/EN/GREECE-EN.PDF

Financial News. (2011, 07 25). *"A history of debt defaults: Argentina 2001"*. Retrieved 02 09, 2013, from www.efinancialnews.com: http://www.efinancialnews.com/story/2011-07-25/history-of-debt-defaults-argentina-2001#.URYshCezJ8E

Financial Post. (2013, 04 18). *"How a student took on two Harvard economists over their pro-austerity study — and won"*. Retrieved 05 01, 2013, from business.financialpost.com: http://business.financialpost.com/2013/04/18/reinhart-rogoff-austerity-study/

Financial Times Dictionary. (n.d.). *"Austerity Measures"*. Retrieved 02 12, 2013, from lexicon.ft.com: http://lexicon.ft.com/Term?term=austerity-measure

Frank, D. (2004-2005). "How Currency Boards Collapse- The Case of Argentina". *Institute for Foreign Trade and Payments and European Integration, Economics Department* (p. 21). Basel, Switzerland: University of Basel.

Garcia, R. J. (2012, 08). *International economy and finance.* (R. J. Garcia, Performer) Norwegian University of Life Siences, Ås, Akershus, Norway.

Grauwe, P. D. (2009). *"Economics of Monetary Union"*. Oxford: Oxford University Press.

Grauwe, P. D. (2006, 9). "Flaws in the Design of the Eurosystem?". pp. 137-144.

Harding, L. (2012, 05 21). *"Greece and the euro: The essential guide"*. Retrieved 03 01, 2013, from www.guardian.co.uk: http://www.guardian.co.uk/world/2012/may/21/greece-euro-exit-essential-guide

Heinz, F. F., & Rusinova, D. (2011). *"How flexible are real wages in EU countries?"*. Frankfurt: The European Central Bank.

Hong Kong Monetary Authority. (1998, November). "Strengthening of Currency Board ". pp. 7-11.

IMF Statistics Department. (2004, 10 26 - 29). *"Currency Union Technical Expert Group (CUTEG)"*. Retrieved 01 30, 2013, from imf.org: http://www.imf.org/external/pubs/ft/bop/2004/04-34.pdf

Investopia. (u.d.). *"European Central Bank"*. Hentet 02 05, 2013 fra www.investopedia.com: http://www.investopedia.com/terms/e/europeancentralbank.asp

James, B. (2000, 06 20). *"EU Invites Greece to Join The Single Currency Fold"*. Retrieved 01 29, 2013, from www.nytimes.com: http://www.nytimes.com/2000/06/20/news/20iht-A1_2.html

Kenen, P. B. (1969). "The Theory of Optimum Vurrency Areas: An Eclectic View". In R. Mundell, & A. Swoboda, *Monetary Problems of the International Economy* (pp. 41-60). Chicago: University of Chicage Press.

Kim, J.-H., Park, K.-Y., & Sung, T. (2012, 10 12). "Does Fiscal Policy Help Those Who Need It Most? Evidence from the US and the Eurozone". *Global Economic Review* , ss. 33-44.

Korhonen, I., & Fidrmuc, J. (2001). *"Similarity of Suooly abd Demand Shocks between the Euro Area and the Accession Countries. Focus on Transition"*. Vienna: Austrian National Bank.

Krugman, P. (1979). "A model of Balance of Payment Crisis". *Journal of Money, Credit and Banking* , 11(3): 311-25.

Krugman, R. P., & Obstfeld, M. (2006). *"International Economics: Theory and Policy"*. Boston: MA: Pearson.

Kuepper, J. (n.d.). *"What is Austerity? Austerity Measures and their Impacts"*. Retrieved 02 12, 2013, from interntationalinvest.about.com: http://internationalinvest.about.com/od/gettingstarted/a/What-Is-Austerity.htm

Lai, K., Ha, J., & Leung, C. (2002). *"Comparing flexibility in Argentina and Hong Kong"*. Hong Kong: Hong Kong Monetary Authority.

Matziorinis, K. (1993, 02 19). *"Greek economy at a turning point: Recent performance, current challenges and future prospect"*. Retrieved 02 28, 2013, from www.canbekeconomics.com: http://www.canbekeconomics.com/research_papers/greek_economy_turning_point.pdf

McKinnon, R. I. (1963 (4)). "Optimum Currency Areas". *American Economic review* , 717-725.

Mundell, R. (1961). "A theory of Optimal Currency Areas". *American Economic Review* , 51.

Nelson, R. M., Belkin, P., & Mix, D. E. (2011). *"Greece's Debt Crisis: Overview, Policy"*. Congressional Research Service.

New York Times. (2012, 12 13). *"Greece"*. Retrieved 02 25, 2013, from nytimes.com: http://topics.nytimes.com/top/news/international/countriesandterritories/greece/index.html

phantis. (2013, 01 15). *"Undeclared work rose to 36% in Greece in 2012"*. Retrieved 01 21, 2013, from www.phantis.com: http://www.phantis.com/news/undeclared-work-rose-36-greece-2012

Reuters. (2013, 02 08). *"Greece gets silver lining to budget plans for coming years"*. Retrieved 04 11, 2013, from rt.com: http://rt.com/business/greece-budget-deficit-2013-reduced-759/

Rockoff, H. (2000). "How long did it take the United States to Become an Optimal Currency ". *NBER Historical Paper* , 1-50.

Steigum, E. (2004). *"Moderne Makroøkonomi"*. Oslo: Gyldendal Norsk Forlag.

Stephen, C., & Daley, C. (2010, 10). *"The Eurozone Crisis"*. Retrieved 01 07, 2013, from civita.org.uk: http://www.civitas.org.uk/eufacts/download/TheEurozoneCrisis(Oct2010).pdf

The European Central Bank. (2012, 07 30). *"Benefits of the euro"*. Retrieved 02 05, 2013, from www.ecb.int: http://www.ecb.int/ecb/educational/facts/euint/html/ei_007.en.html

The European Central Bank. (n.d.). *"Financial Stability"*. Retrieved 02 05, 2013, from www.ecb.int: http://www.ecb.int/ecb/orga/tasks/html/financial-stability.en.html

The European Central Bank. (n.d.). *"Independence"*. Retrieved 02 05, 2013, from www.ecb.int: http://www.ecb.int/ecb/orga/independence/html/index.en.html

The European Central Bank. (2012, 07). *"Monetary and fiscal policy"*. Retrieved 02 06, 2013, from www.ecb.int: http://www.ecb.int/pub/pdf/other/art1_mb201207en_pp51-64en.pdf?1cb4c58b75f513d91c6598cac377e4ca

The Guardian. (2012, 03 09). *"Greek debt crisis: timeline"*. Retrieved 02 19, 2013, from m.guardian.co.uk: http://m.guardian.co.uk/business/2012/mar/09/greek-debt-crisis-timeline

The Independent. (2010, 04 09). *"Fitch downgrades Greek debt to BBB-minus"*. Retrieved 01 07, 2013, from www.independent.co.uk: http://www.independent.co.uk/news/business/news/fitch-downgrades-greek-debt--to-bbbminus-1940587.html

The Observatory of Economic Complexity. (2013). *"Where does Greece export to"*. Hentet 04 30, 2013 fra atlas.media.mit.edu: http://atlas.media.mit.edu/explore/tree_map/export/grc/show/all/2006/

The Telegraph. (2012, 05 06). *"Debt crisis: Greek euro exit looms closer as banks crumble"*. Retrieved 02 16, 2013, from www.telegraph.co.uk: http://www.telegraph.co.uk/finance/financialcrisis/9270884/Debt-crisis-Greek-euro-exit-looms-closer-as-banks-crumble.html

The Telegraph. (2012, 05 18). *"Greek euro exit: What the economists say"*. Retrieved 02 28, 2013, from www.telegraph.co.uk: http://www.telegraph.co.uk/finance/financialcrisis/9273786/Greek-euro-exit-what-the-economists-say.html

The World Bank. (2013). *""Imports of Goods and Services (in % of GDP)"*. Retrieved 04 05, 2013, from data.worldbank.org: http://data.worldbank.org/indicator/NE.IMP.GNFS.ZS/countries?page=2

The World Bank. (n.d.). *"Exports of goods and services (% of GDP)"*. Retrieved 04 20, 2013, from The World Bank, Working for a World Free of Poverity: http://data.worldbank.org/indicator/NE.EXP.GNFS.ZS?page=2

Tsoukalis, L. (2012). *"Resolving the European Debt Crisis, special report 12."*. Washington DC: Peterson Institute for International Economics.

TV2 nyheter. (2011, 06 27). *"Svart økonomi og korrupsjon i Hellas: – Jeg ble sint og følte meg lurt"*. Hentet 02 28, 2013 fra tv2.no: http://www.tv2.no/nyheter/utenriks/svart-oekonomi-og-korrupsjon-i-hellas-jeg-ble-sint-og-foelte-meg-lurt-3527272.html