Final Report for Contemporary Concerns Study

The economics of a common currency in the context of Eurozone

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1. Background of Euro Zone

The adoption of the Euro was one of the most significant steps in the road to economic and financial integration of Europe that started in 1957, with the formation of the European Economic Community (EEC). Over the years, under the European directives, the member states started to ease capital controls and deregulate interest rates to pave the way for a single financial market. The Maastricht Treaty, signed in Feb 1992, created the foundational pillars for the European Union and the adoption of a single currency Euro.

Besides furthering the economic integration of Europe, proponents of Euro believed that it would reduce transaction costs, increase capital movement across borders and eliminate currency risks. While all these are hard to quantify, thus making it difficult to validate these perceived benefits, there has been growing literature on the hampered recovery post the 2010 Euro crisis because of loss of flexibility due to a common currency (Hishow, 2007). Thus, the benefits seem to have been skewed and even periphery nations that benefitted initially, such as Greece and Spain, have faced recessionary environment for years (Hurtado, 2012).

Before the adoption of the Euro, the Eurozone adopted the Stability and Growth Pact that enforced budgetary discipline on the countries adopting the common currency. However, little attention was paid to the institutional frameworks necessary for supporting the smooth functioning of a common currency. More importantly, for the adoption of a common currency, the political establishment should have worked with economists and factored the conditions and geography under which a common currency can operate. In academic parlance, this is often referred to as the Optimum Currency Area.

In this paper, we first analyze the various definitions of Optimum Currency Areas as described by Mundell, McKinnon and Kenen, who are regarded as pioneers in this field. We then review whether the member states met the conditions for an Optimum Currency Area. We also evaluate the homogeneity of the member states on the factors that would be necessary for adopting a common currency and for dealing with asymmetric shocks such as the one that has been observed in the Eurozone in 2010.

We then analyze what are the institutional frameworks necessary for the sustainability of a common currency, which of these have already been created in the Eurozone and which need to be created to avoid a breakup of the Eurozone.

2. Theory behind Optimum Currency Area

The theory of optimum currency area tries to define the appropriate area within which a single currency should operate to maximize economic efficiency. The phrase Optimum Currency Area (OCA) was first used by the Canadian economist Mundell in his paper "A Theory of Optimum Currency Areas" (Mundell, 1961). The theory was developed further in two other significant papers by McKinnon (McKinnon, 1963) and Kenen (Kenen, 1969), respectively. These three papers looked at different dimensions deemed necessary by the authors for defining a single currency area.

The common underlying theme was that a single currency area need not be limited by geographical borders. Since the adoption of the Eurozone, these views have been visited by several economists and used to argue for and against the adoption of Euro as a common currency.

2.1 Robert A Mundell

Mundell (1961) set the foundational pillar of an optimum currency area. He stressed on labour mobility as a critical factor for establishing a common currency area.

At the time his paper was published, the focus was on the adoption of a flexible exchange rate since the Bretton Woods exchange system had been in existence. Hence, Mundell drove his argument of an optimum currency area by contrasting regions that should have a fixed exchange rate amongst themselves against regions that should have a flexible exchange rates. According to Mundell, the former constituted an optimum currency area.

Based on the above statement, he begins with the hypothesis that "the optimum currency area is not the world" through an illustration of a model consisting of two countries A and B, which are in balance-of-payments equilibrium initially. He then postulates, under two cases, how these two regions would be impacted if this equilibrium is disturbed if demand shifts from goods produced by B to those produced by A.

In the first case, Mundell assumes that these two countries have separate currencies. In such a scenario, the central bank in A can either allow prices to rise or take steps to control inflation. If it pursues the latter, the burden of adjustment lies on central bank of region B, which must be accomplished by reduction in B's output and employment (with the Keynesian assumption that wages are not flexible).

In the second case, Mundell assumes that these two countries are lubricated by a common currency. In this case, too, there is a trade-off between unemployment and inflation. Thus, Mundell questions the establishment of a currency area based purely on boundaries than an economic criterion as this would not yield a system wherein economic stability can be achieved without significant economic costs.

Mundell extended this scenario further by examining the contrasting positions of J.E. Meade (Meade, 1957) and Tibor Scitovsky (Scitovsky, 1958) on the idea of a common currency for Western Europe. Meade argued that the conditions for a common currency do not exist in Western Europe because of lack of labour mobility and thus, a system of flexible exchange rate would be better for internal stability and balance-of-payments equilibrium. On the other hand, Scitovsky was in favour of adopting a common currency to make labour more mobile. In both the views, mobility

of labour was the common theme. Hence, Mundell asserted that it was a crucial factor in establishing an area with common currency.

The rationale behind this was that in case of situation discussed above, where there is unemployment in one region and inflation in the other, the only way to restore equilibrium in case of a fixed-exchange-rate regime would be for labour to move from the depressed region to the prospering region.

In his work, Mundell also made an attempt to define an upper limit on the number of currency areas. As discussed above, Mundell has already argued that the optimum currency area is not the world. At the same time, Mundell also emphasized that regions cannot be defined so narrowly to count every region of unemployment arising from labour immobility as a separate region as that would create multiple currency areas and increase the transaction costs significantly.

Mundell concluded his argument for a common currency area based on labour mobility while keeping in mind that a currency area is often a reflection of national sovereignty, whereas a region of optimum currency area may extend beyond borders. This is extremely relevant in the context of Eurozone since it is probably the first instance where a common currency has been adopted by nations that have long sought to protect their national sovereignty.

2.2 Ronald McKinnon

McKinnon (McKinnon, 1963) furthered Mundell's idea of an optimum currency area based on the influence of openness of trade as a criterion. McKinnon defined an optimum currency area as an area with a single currency to achieve three objectives: (1) maintenance of full employment (2) maintenance of balance-of-payments and (3) maintenance of stable average price level. These objectives are considered conflicting by him since one of them will have to be compromised to achieve the other two.

McKinnon leverages the definition of tradable (exportable and importable) and non-tradable goods, as defined by RF Harrod (Harrod, 1957), to determine the openness of an economy. The larger the proportion of tradable goods, more open the economy is.

McKinnon drives his argument using two cases. In the first case, he considers an economy in which is highly open, i.e. has a high proportion of tradable as compared to non-tradable. If this area had a flexible exchange rate, then a disequilibrium in the balance-of-payments would cause a devaluation of the currency and increase in the prices of the tradable goods, causing an internal price level instability. In addition, the balance-of-payments may actually not be restored (Pearce, 1961) and fiscal-monetary action may be required to restore equilibrium. Instead, if the country had a fixed-exchange rate, then a swift domestic policy to cut imports and increase exports would restore the equilibrium and maintain price-level stability.

In the second case, McKinnon considers a relatively closed economy where the ratio of tradables to non-tradables is small. In such a case, if there is a trade imbalance, then the country could devalue its currency which would lead to an increase in the price of tradables, thus moving factors of production (primarily labour) to the production of exports and simultaneously a reduction of imports. On the other hand, if monetary-fiscal policy is relied upon, it would cause large scale unemployment. Thus, in the case of an open economy, while a flexible exchange rate may help

restore trade balance, the internal price instability will be very low. On the other hand, for a closed economy, a flexible exchange is preferred.

McKinnon furthers his argument for different exchange rate regimes by understanding the liquidity of money. He argues that if by virtue of the size of an economy and its monetary frameworks, a currency is less liquid, the domestic nationals will accumulate the foreign currency. In such a case, it may be more suitable to peg the 'weaker' currency to the currency of a larger area. On the other hand, short-term capital flows among currencies of equal liquidity are less likely, giving the central banks room to adopt a monetary policy that focuses more on full employment than price stability. Thus, even if an economy was closed, it would not make sense to adopt a flexible exchange rate regime if the domestic currency is less liquid as this would lead to capital outflows and currency depreciation.

McKinnon combines his ideas with that of Mundell's by arguing that if a depressed region cannot overcome unemployment by developing new skills, then it should work with another region to develop factor mobility and the two regions should be joined by a common currency. Indeed, this was often the rationale used by proponents of the Euro to argue for a common currency area.

McKinnon's views on trade openness and currency liquidity can be summed as (a) open economies should have a fixed exchange rate regime and (b) open economies that trade extensively with each other should form a currency union to protect against fluctuation in prices.

2.3 Kenen

While Mundell and McKinnon focussed on the economic factors and the monetary aspect of single currency area, Kenen brought in a different dimension to the argument by analysing the impact of fiscal structures required for the functioning of a common currency.

Kenen (Kenen, 1969) emphasizes the need for fiscal integration between the regions in a common currency area to effectively protect regions affected by an asymmetric shock. In the absence of fiscal integration in a common currency area, if only one region faces an economic shock, it does not have the option of devaluing its currency, unlike in the case of a multiple currency area. In order to support the depressed region, a unified fiscal body can help shield it and provide the necessary stimulus to help in the recovery process. The existence of a common currency in the fifty states of the USA with a federal support in case of asymmetric shocks makes a currency union stronger and less susceptible to break-ups.

Kenen also argues for the presence of a central bank as a lender of the last resort for regions (or countries) in a unified currency area to protect debt-laden countries from defaulting during a crisis. In the case of the Eurozone, this would ensure that banks bailout are not a burden on the governments.

3. Factors to be considered for determining optimum currency area

a. Labour Mobility (Mundell)
b. Degree of openness and/or trade integration (McKinnon)
c. The size of the economy (McKinnon)
d. Degree of financial integration (Kenen)

4. Convergence criteria of Euro Zone

The Maastricht Treaty which was enforced in November 1993, prescribed 4 criteria for measuring level of convergence and preparation for adoption of Euro as the common currency: - (Treaty on European Union (Maastricht Treaty), 1992)

4.1 Price stability / Low Inflation –

The 12-month average of monthly inflation of the nation being evaluated for admission, measured as per Harmonised Index of Consumer Prices (HIPC) should not exceed by more than 150 bps above the reference HIPC value. Reference HIPC value is the unweighted average of monthly inflation of three best performing Member States in terms of price stability (having lowest HIPC). Countries having HIPC below the average Eurozone are to be excluded for the computation if it is established that the prices are impacted strongly by exceptional factors. The objective of this criteria was to ensure price stability post the country is admitted to the European and Monetary Union (EMU).

4.2 Sound public finance / Government Budget Deficits

(a) The amount of planned or actual government deficit should not exceed 3% of GDP (at market price). In case the ratio exceeded the reference value, it has declined significantly and continuously and very close to the reference value; or the excess is temporary and due to exceptional circumstances and is close to reference value

(b) The amount of Government debt should not exceed 60% of GDP (at market prices). In case the ratio exceeded the reference value, it should be declining and approaching the reference value at a satisfactory pace.

The latter clause granted discretion to the Council for admission of nation states. Later in December 2011, *satisfactory pace* was defined and operationalised (Treaty on Stability, Coordination and Governance in the Economic and Monetary Union, 2012).

4.3 Stable exchange rates

The country should not have devalued its currency against any of the Member States and have participated in the Exchange Rate Mechanism (ERM-II) of the European Monetary System for the last 2 years. Exchange Rate Mechanism allowed exchange rate to fluctuate within the margins prescribed.

4.4 Stable long-term interest rates

The average nominal long-term interest rate over a period of one year should not exceed by more than 2% above the average of three best performing Member States in terms of price stability. The interest rates shall be measured for long-term government securities (generally 10-year) or comparable securities.

The ECB evaluates compliance of convergence criteria every 2 years and publishes convergence reports.

5. Divergence among Euro member nations

5.1 Factors identified as per theory behind OCA

Labour Mobility

Mundell in his seminal work (Mundell, 1961) emphasized on labour mobility within regions having common currency. The concept of free movement of labour was first recognized in 1992 with signing of Maastricht Treaty which introduced common citizenship within EU nations. Later, the Schengen Agreement was signed in 1995 creating a borderless region between France, Belgium, Portugal, Germany, Netherlands, Luxembourg, and Spain. Several amendments were made later to add more countries to Schengen region and promote free movement of labour. However, despite the freedom of movement guaranteed by EU treaties, there exists certain challenges to labour mobility.

(a) Language proficiency remains the biggest obstacle to labour movement. Prominent Languages spoken in the Member States who joined Euro in 1999 are as follows: -

SN	Country	Prominent Language(s)
1	Austria	German
2	Belgium	Dutch and French
3	Finland	Finnish
4	France	French
5	Germany	German
6	Ireland	English
7	Italy	Italian
8	Luxembourg	Luxembourgish, French and German
9	Netherlands	Dutch
10	Portugal	Portuguese
11	Spain	Spanish

(b) Pension Portability – portability of pensions when a person moves from one state to another also acts as a hindrance in mobility of labour force. It is difficult to transfer pension balances from one Member State to another Member State.
(c) Recognition of Professional Qualification – EU citizens face difficulties in getting their professional and educational qualifications recognized in other Member States.

Over the years, the European Commission has taken many steps to solve the above problems:

1. Mandating teaching of mother tongue and 2 more languages
2. Pensions Portability Directive – improving supplementary pension rights
3. Simplifying the process of recognition of qualifications across Member States

However, the problem is manifested in huge disparity in unemployment numbers across Member States. Some researchers also argue that the labour mobility among different states in USA is much higher than in EU nations and is primarily due to reasons cites above.

Trade Openness

McKinnon (McKinnon, 1963) argued for a single currency area based on two factors – the openness of an economy and the liquidity of the local currency. By comparing the impact of a flexible exchange rate on the prices of tradable goods, he emphasized that regions with highly open economy should not adopt a single currency as this would lead price instability at the cost of balance-of-payments equilibrium (refer to section 2.2).

We measure the openness of an economy in terms of the trade as a percentage of the GDP. This is a substitute for McKinnon's definition of openness as that focusses on the ratio of tradable goods to non-tradable goods. This definition is sharp in its distinction of goods and thus, is difficult to measure.

Country	1998	2003	2008	2013	2016
France	49.01	50.13	56.52	59.10	60.58
Germany	51.58	61.52	80.94	84.96	84.36
Greece	42.27	48.19	59.33	63.52	60.98
Portugal	63.81	60.44	71.96	78.03	79.34
Spain	52.86	53.11	55.76	61.18	63.22

Table 1: Trade as a percentage of GDP
Source: World Bank national accounts data, and OECD National Accounts data files
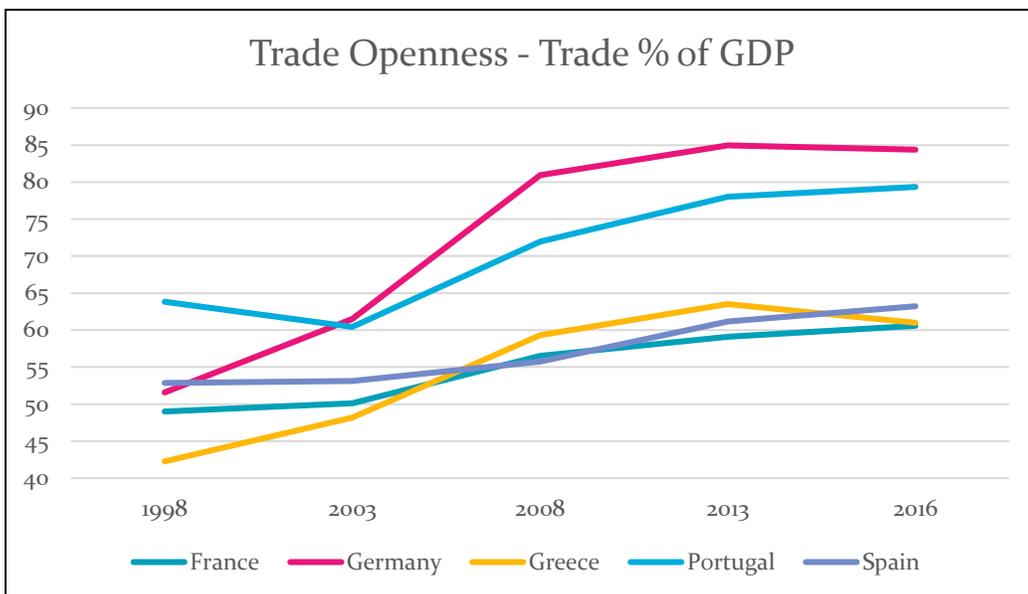

Figure 1: Trade as a percentage of GDP
Source: World Bank national accounts data, and OECD National Accounts data files

In the years leading up to the adoption of the Euro, the trade to GDP ratio varied significantly amongst the countries being compared. While Portugal was highly open at a trade to GDP ratio of 63%, Greece was the least open at a value of 42%. If these figures are viewed in isolation, the proportion of trade to GDP is high for each of these economies to meet McKinnon's criteria for a single currency. However, the counter argument on McKinnon's view is the potential benefit from increased trade by the adoption of the Euro. In fact, in the years after the adoption of the Euro, trade across borders did increase significantly. Germany's trade as a percentage of GDP increased rapidly from 51% in 1998 to 84% in 2013. However, further analysis is required to understand what part of it can be attributed to the adoption of the Euro and what part of this increase comes from trading within the European Union.

Fiscal Integration

The countries using Euro are part of an economic and monetary union but not a fiscal union. Although EU had limited powers, most decisions related to taxation and government spending are made at national level. The reason being fiscal independence is central to a country's sovereignty.

At inception, it was thought countries would not face severe idiosyncratic shocks. This was ensured by putting in place checks to ensure some level fiscal soundness at each nation level. However, since formation of EMU, many countries have faced severe idiosyncratic shocks partly owing to diverse fiscal policies. These countries did not create sufficient fiscal buffers during good times.

Fiscal integration can solve this problem by enforced fiscal discipline and temporary transfers. Level of fiscal integration would depend of political and social preferences. However, it is necessary to have 1.) incentives to have sound fiscal policies to build sufficient buffers, 2.) better oversight over fiscal policies and robust corrective measures, 3.) mechanism for temporary transfers during rainy days and 4) common borrowing and risk-sharing.

5.2 Euro Convergence criteria

In 1999, 11 EU countries joined the common currency regime, Euro. The convergence criteria were evaluated as of 1997 (European Commission, 1998)

a. **Inflation:** All the countries met price stability criteria of having inflation within the reference value (1.5% + average of 3 best performing countries i.e. 2.7%).
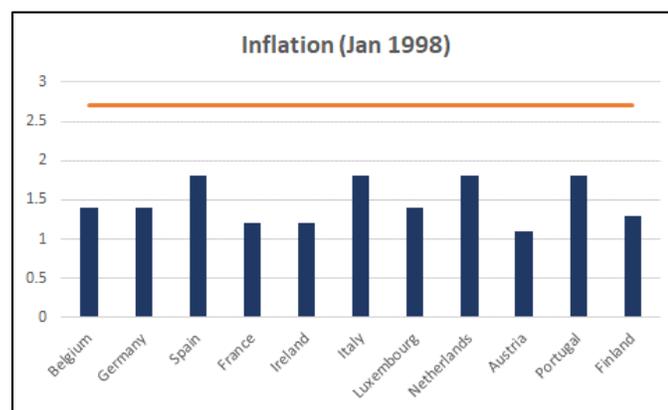

Figure 2: Inflation rates
Source: Convergence Report 1998

b. Government Debt to GDP ratio: Most of the countries exceeded the upper limit of 60% agreed in the Maastricht Treaty. However, all countries were excused by the Council because either the excess debt was due to exceptional circumstances or the country was on the path on declining debt at a satisfactory pace.

Even Greece, which later joined Euro in 2001, had Government Debt to GDP ratio of 116%, much higher than the reference value of 60%. The Council granted excuse Greece on similar grounds as mentioned above.
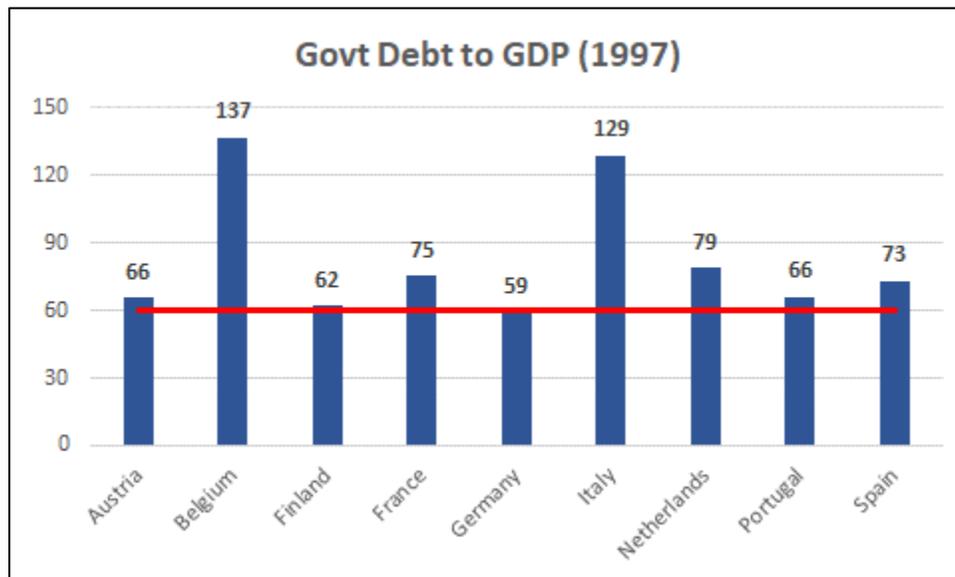

Figure 3: Government Debt to GDP Ratio – 1997 (in %)
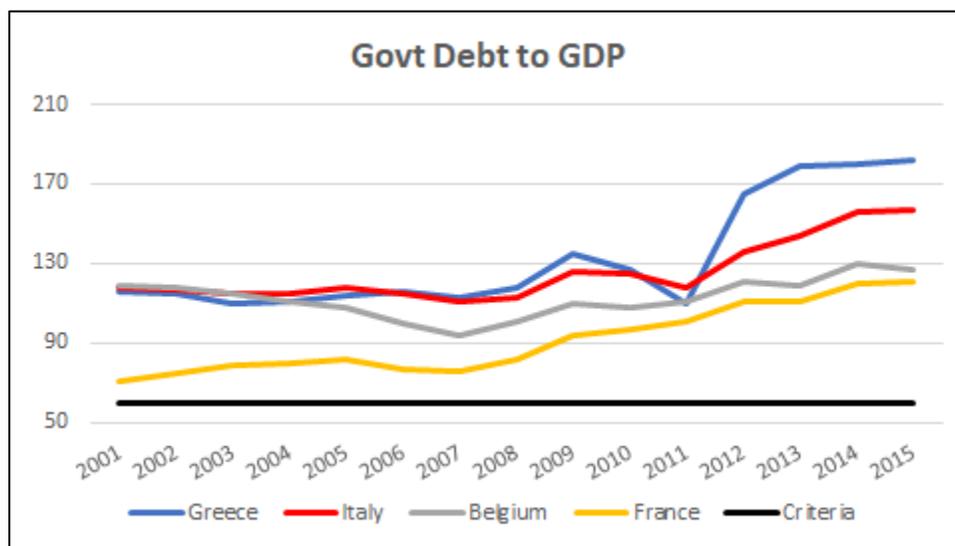*Source: OECD Data*

Figure 4: Government Debt to GDP Ratio (in %)
Source: OECD Data

The debt position of most of member nation states never met the agreed criteria. In fact, it continued to increase in the coming years. Status of few of the countries over the years is depicted in Figure 4 below.

c. Government Deficit

All EU countries which adopted the Euro in 1999 had government deficits within 3% of their GDP. *(Refer Figure 5).* However, the deficit increased and went above the limit for some of the Euro countries in future years, esp. post 2008 crisis. Government deficit for Greece ballooned to c.15% in 2009 and crossed 11% for Spain and Portugal in 2009 and 2010 respectively. *(Refer Figure 6)*
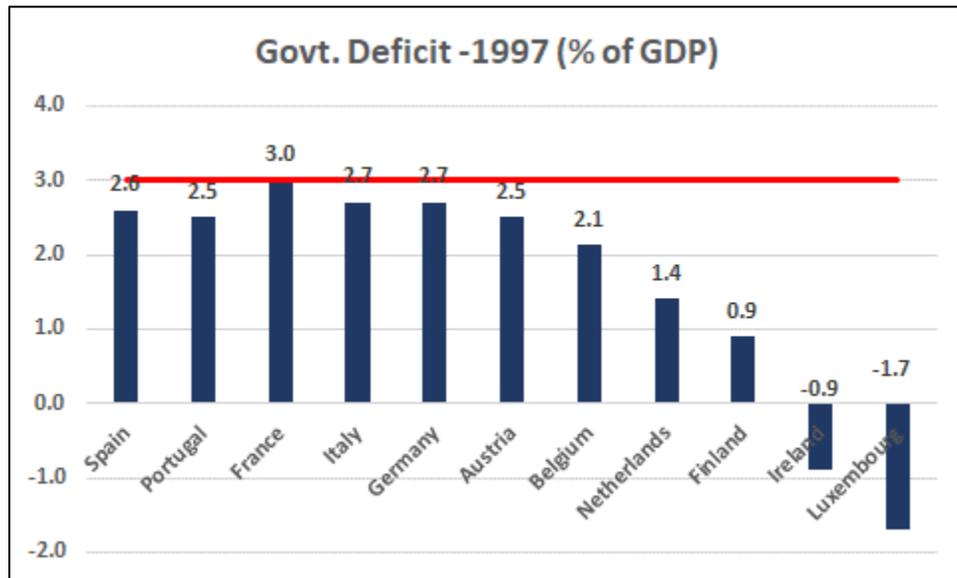

Figure 5: Government Deficit to GDP Ratio – 1997 (in %)
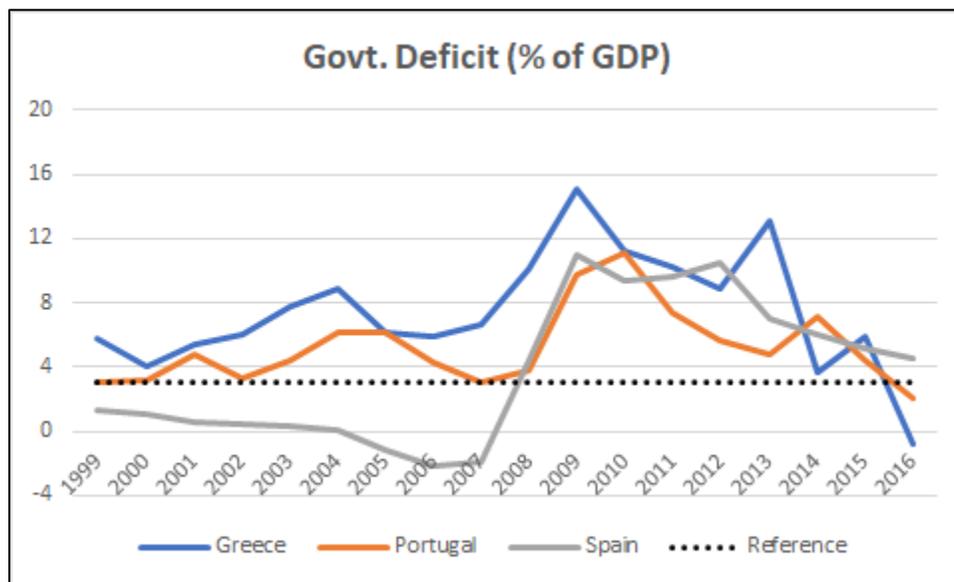*Source: Convergence Report 1998*

Figure 6: Government Deficit to GDP Ratio (in %)
Source: OECD Data

d. Long-term interest rates

Yield on 10-year Government Bonds for all countries which adopted Euro in 1999 were within the limits (average of best 3 performing countries + 2% i.e. 7.8%) set in the Maastricht Treaty.

However, post 2008 financial crisis, interest rates for Greece and Portugal increased significantly on fears on Government default. This is another evidence of idiosyncratic shocks witnessed by Greece and Portugal
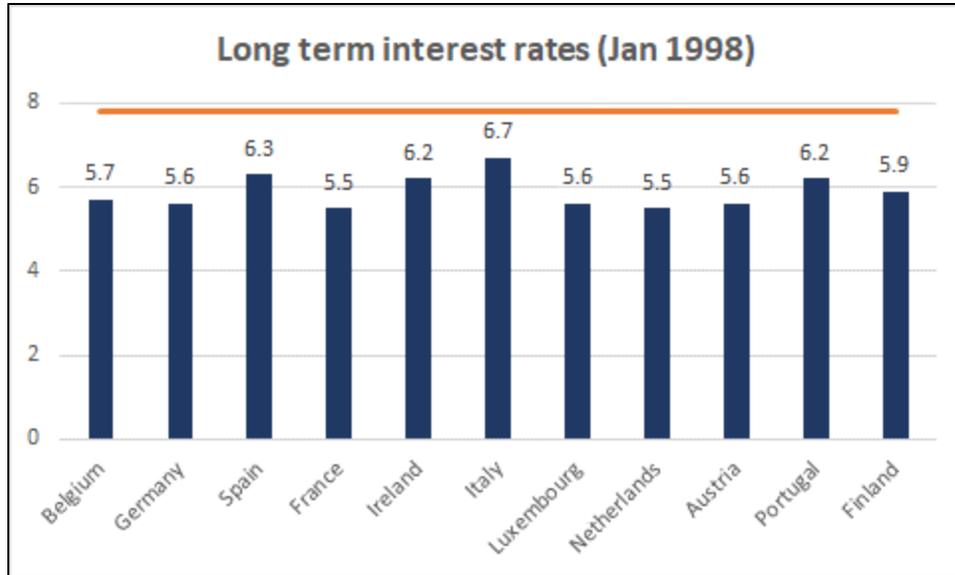

Figure 7: Long Term Interest Rates (Jan 1998)
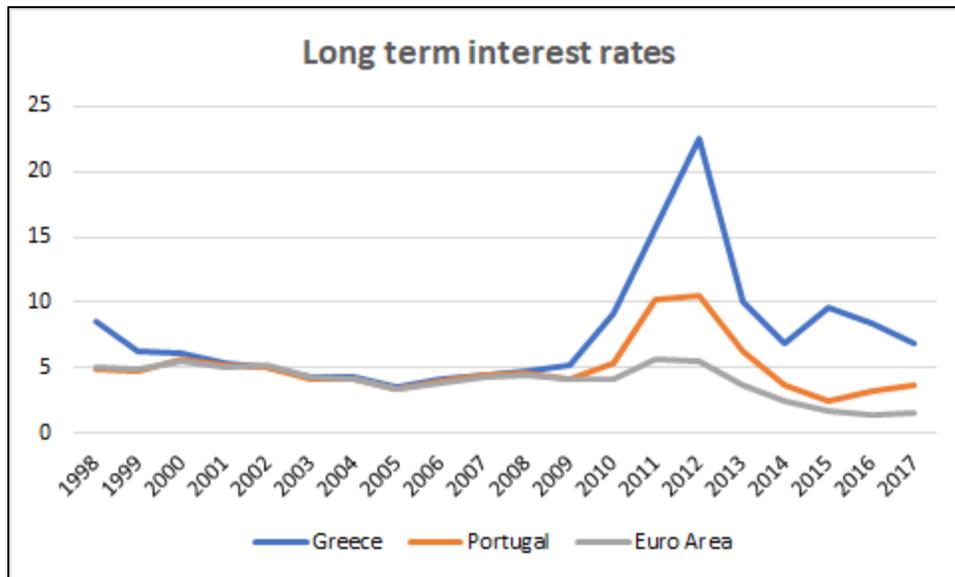*Source: Convergence Report 1998*

Figure 8: Long Term Interest Rates
Source: OECD Data

5.3 Other factors

Product Market Regulation

The PMR index, developed by OECD, measures how the policies of a country promote or inhibit competition. The indicator looks at the various reforms and the market structure in an economy to develop an internationally comparable index for assessing the competitiveness of an economy. A lower value implies more competitiveness. The PMR index constitutes 3 measures – the level of state control in businesses; the barriers to entrepreneurship; and the barriers to trade and investment.

While adopting a common currency, it is imperative that all the markets have nearly the same level of competitiveness to ensure that capital flows are directed evenly and that the regions which are part of the currency union have a level playing field.

Country	1998	2003	2008	2013
France	2.38	1.77	1.52	1.47
Germany	2.23	1.80	1.40	1.28
Greece	2.75	2.51	2.21	1.74
Portugal	2.59	2.12	1.69	1.29
Spain	2.39	1.79	1.59	1.44

Table 2: Product Market Regulation Index
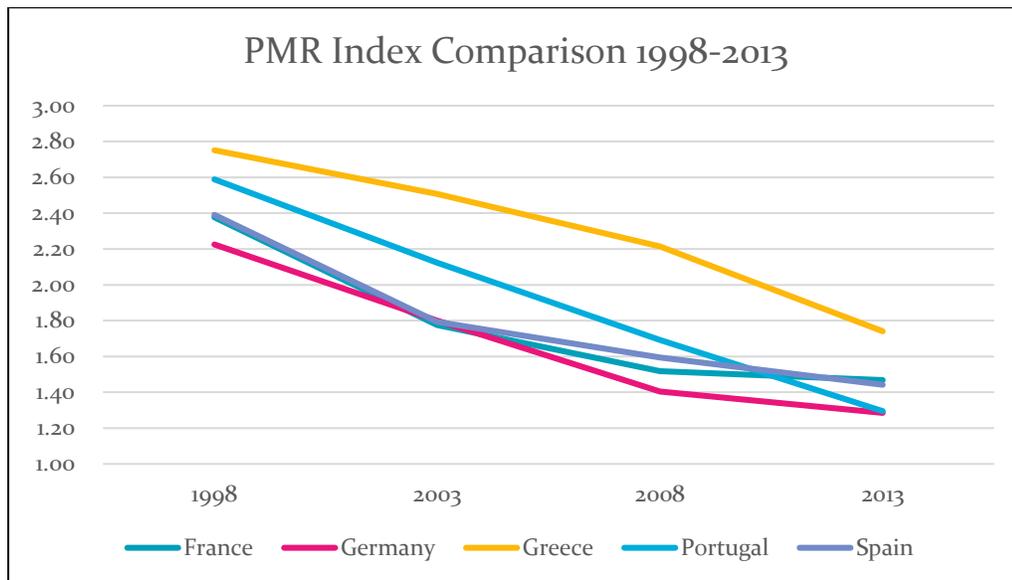*Source: OECD Stats*

Figure 9: Plot of PMR index from 1998 to 2013
Source: OECD Stats

A comparison of the PMR index across time between some of the debtor countries and the creditor countries reveals that the former have consistently had lower PMR. Spain is the only country amongst the debtors that has a PMR index close to that of Germany and France.
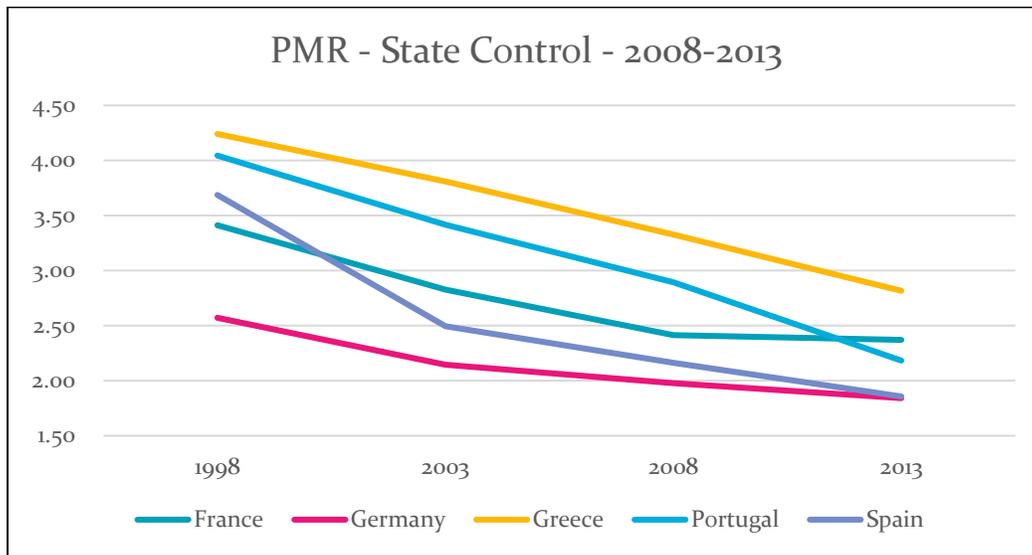
Figure 10: Plot of PMR State Control from 2008 to 2013
Source: OECD

To understand the viability of a common currency along with competitiveness, one of the critical factor that needs to be evaluated is the extent of state control over businesses in an economy. The presence of excessive state control is inhibitive to the growth of businesses and ensuring that capital inflows are efficiently utilized (Curristine, Lonti, & Joumard, 2007). A review of the PMR – State Control index reveals striking differences that should have raised concerns about the viability of the Euro at the time of its adoption. Greece and Portugal, both of which are struggling as a result of the asymmetric shocks after the 2010 Euro crisis, are high on state control. In 1998, Greece and Portugal had a PMR – State Control index value of 4.24 and 4.04, against 2.57 and 3.41 for Germany and France.

Pressure from the European Union and the Troika have resulted in Greece and Portugal taking actions that have brought down the level of state control. However, as can be observed in the above chart, the level is still significantly above Germany and France. The notable exception is the level of improvement in Spain since 2003, which now is at Germany's level.

Education and Skills

Mundell's idea behind labour mobility as a prerequisite for an optimum currency area was that in case of an asymmetric shock, people from the depressed region can move to the prospering region and restore the imbalance that may have been caused due to a shift in demand of goods.

However, Mundell did not touch upon the fact that for such a movement of labourers, they must have the required skillset to operate in the industry of the prospering region. A skill-mismatch or lack of the required level of education will act as a barrier. This problem would be further aggravated if within each of the merging region in an optimum currency area, there is already a skill-mismatch.
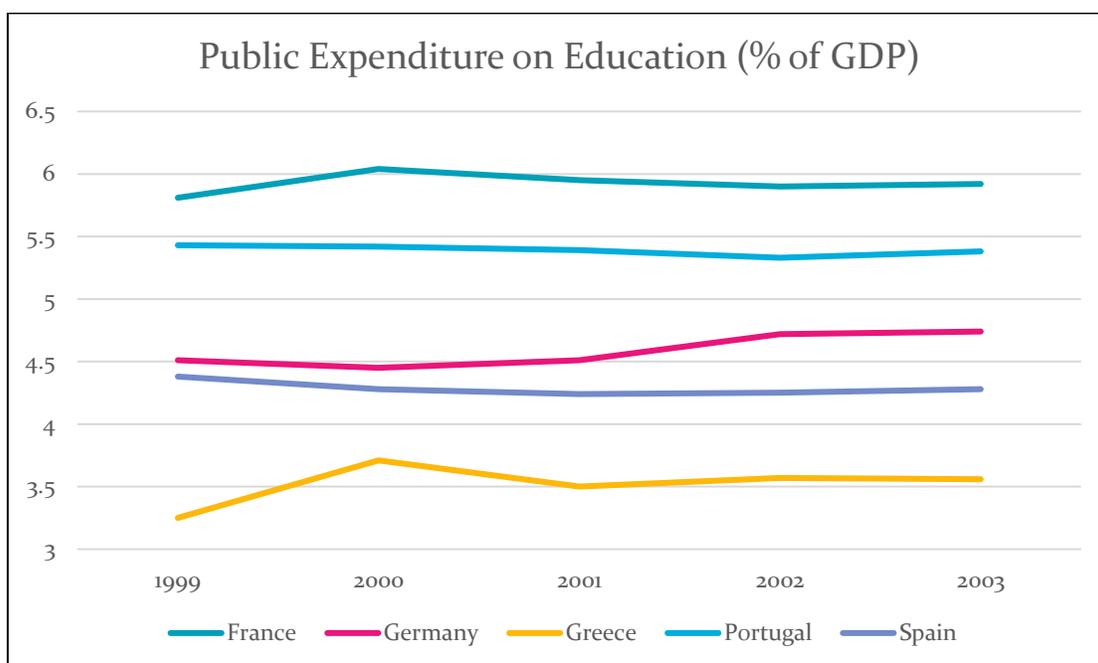
Figure 11: Public Expenditure on Education
Source: Eurostat

First, we analyze the public expenditure on education as a percentage of GDP. The chart above demonstrates that there was huge variation in the expenditure on education in 1999, with Greece lowest at 3.25% and France highest at 5.81%. This expenditure includes both, the expenditure on funding and subsidizing institutes and the supporting students and their families with scholarships and public loans.

A deeper analysis of the percentage of graduates from tertiary education graduating from STEM programs gives insight into the skill level mismatch which we discuss later. There is a stark difference in these numbers between the debtor and creditor countries.

Year	1999	2000	2001	2002
France	30.0	30.3	..	29.8
Germany	27.3	26.5	25.8	26.1
Portugal	..	17.7	..	18.3
Spain	23.5	25.0	26.7	27.2

Table 3: Percentage of graduates from tertiary education graduating from STEM field
Source: OECD Stats

Secondly, we analyze the skill shortage and surplus across Europe. In the below table, a positive value represents a skill shortage and a negative value represents a skill surplus. Higher the absolute value, higher the value of the indicator. As can be observed, across Europe, there is a severe skill shortage. The few exceptions are mathematics skills in Portugal, and technical skills in Germany and Spain.

Country	Basic Skills Content	Mathematics Skills	Science	Complex Problem Solving Skills	Technical Skills	Systems Skills
France	0.010	0.008	0.009	0.010	0.008	0.011
Germany	0.019	0.017	0.010	0.018	-0.002	0.018
Greece	0.015	0.004	0.017	0.014	0.002	0.011
Portugal	0.008	-0.003	0.010	0.008	0.003	0.009
Spain	0.025	0.016	0.008	0.018	-0.002	0.021

Table 4: Skill shortage and surplus indicator in 2003
Source: OECD stats

Lastly, we analyze the proportion of workers who are overqualified in each country. This indicator is a reflection of the skill mismatch and the maturity of the industry in these economies. In the time leading up to the adoption of the Euro and slightly after, it can be seen that the peripheral countries i.e. Greece, Portugal and Spain have a greater proportion of workers who are overqualified. Though data is not available for Germany till 2001, the differences are reflected in the data from 2002 onwards, when Greece adopted the Euro.

Year	1998	1999	2000	2001	2002	2003
France	16.55	11.92	12.69	13.18	7.98	8.63
Germany	..	..	..	..	14.05	14.48
Greece	22.68	24.27	20.25	20.15	21.86	23.00
Portugal	13.52	14.56	15.18	15.21	15.83	17.20
Spain	21.12	22.38	23.42	24.24	25.05	22.29

Table 5: Percentage of workers who are overqualified
Source: OECD

To understand the impact of these variables on the economy, it is pertinent to study the output variables also. We analyze the labour productivity, measured as the ratio of GDP per employed person. Higher educational attainment, higher expenditure on education and better skill matching should result in a higher labour productivity. The table below highlights the difference between the creditors and debtors. For instance, in the year 1999, while France and Germany had a labour productivity of around €48k and €39k respectively, Greece and Portugal lagged behind with values around €30k.

Year	1998	1999	2000	2001	2002
France	47,764	48,229	48,744	48,907	49,108
Germany	39,282	39,425	39,949	40,448	40,687
Greece	28,040	28,902	30,053	31,275	31,638
Portugal	27,376	28,105	28,607	28,652	28,704
Spain	38,893	38,952	38,938	39,102	39,197

Table 6: Labour productivity; ratio of GDP per employed person
Source: OECD

Even more striking are the differences in the hourly productivity or the ratio of GDP per hour worked. Germany and France are far ahead than the debtor countries, which raises questions about the argument on increased competitiveness between the Eurozone nations.

Year	1998	1999	2000	2001	2002
Country					
France	30.41	30.91	32.01	32.31	33.28
Germany	26.2	26.44	27.16	27.84	28.23
Greece	13.01	13.5	14.17	14.74	15
Portugal	15.22	15.51	14.53	14.7	14.8
Spain	22.46	22.49	22.5	22.52	22.6

Table 7: Hourly productivity; ratio of GDP per hour worked
Source: OECD

While the input variables, such as public expenditure on education and education levels, show little variation amongst these countries, it is the difference in the productivity that exposes the contrasting nature of these economies. With the high variation in productivity, it is hard to justify the applicability of Mundell's idea of labour mobility to the Eurozone as a cause for adoption of a single currency.

Innovation Index

The only way to improve competitiveness for countries in EMU is to increase productivity since they cannot devalue their currency. Countries like Greece and Portugal lag other EMU countries in terms of productivity. This can be measured in terms of number of patents filed, level of employee skills, total factor productivity, expenditure on R&D, share of high-end manufacturing or advanced technology companies in the economy, etc.

Greece and Portugal had lowest number of patents filed per million inhabitants (Figure 11) in the EU area, much below EU's average. This can be partly attributed to lower spending by corporates on R&D (Figure 12). Another reason is the education system and number of citizens pursuing higher education (explained above). Impact of aforesaid factors was reflected in marginal increment in share of medium and high-end technology in balance of trade (Figure 13) and share of service exports in GDP (Figure 14) in Greece and Portugal during the years 1997-2007.

Due to low competitiveness, these countries lagged other EMU nations and suffered much greater shocks during 2008 global financial crisis.
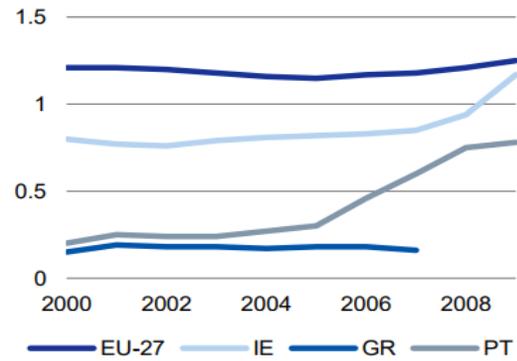
Patent applications filed with European Patent Office, per million inhabitants
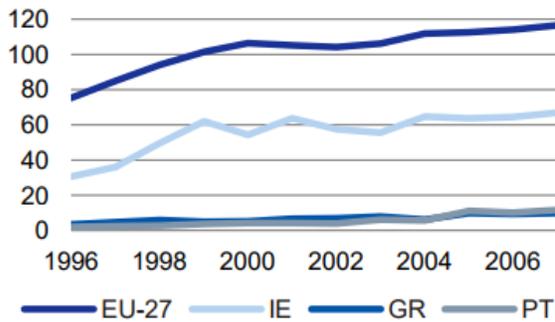
Source: Eurostat, 2011

Figure 12

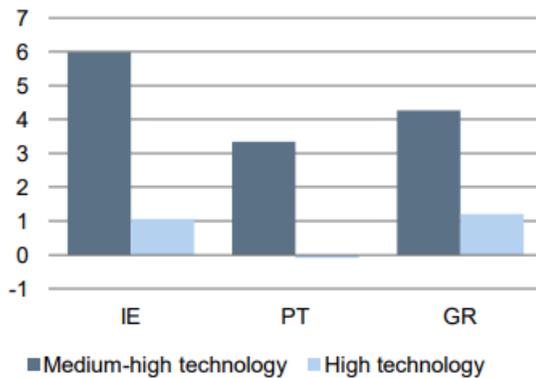**Corporate R&D spending, % of GDP**

Data for Greece in 2006 & 2007 are estimates
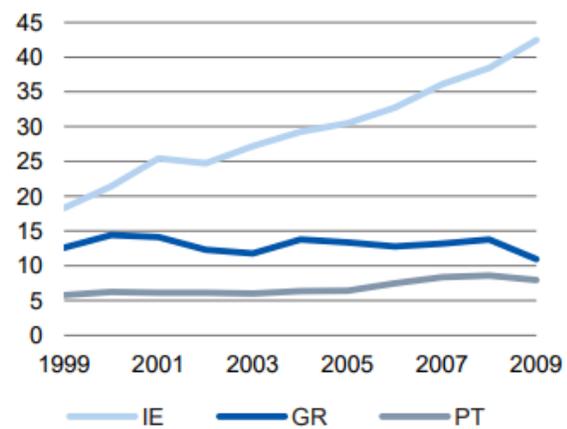
Source: Eurostat, 2011

Figure 13

Contribution to balance of trade / industrial goods Change 1997-2007, pp

Source: OECD 2009

Figure 14

Services exports, % of GDP

Source: OECD 2011

Figure 15

Legend: IE – Ireland, GR – Greece, PT - Portugal
Source: Reproduced from EU Monitor dated 27th January 2017

6. Institutional Framework to ensure compliance

6.1 Stability and Growth Pact (SGP)

All the member nations of the EMU had entered a pact known as SGP on 1st January 1999, which aims to maintain stability and growth of the EMU. Every year, all member nations are required to submit a report on their compliance of Debt-GDP (60%) and government deficit (3%) criteria. In case the country breaches the criteria, a "Excessive Deficit Procedure" (EDP) is initiated against the defaulting nation with a deadline to comply. Despite multiple warnings, if the defaulting nation continues to default, economic sanctions can be issued. EDPs specifies the extent of corrective measures like increase in taxes and austerity measures and the pace at which they must be implemented. France and Germany were the first 2 countries on which EDPs were imposed in 2003. Since then most of the EMU Nations have been subject to EDP at different points in time. A step wise procedure of EDP has been outlined in Exhibit 1.

SGP has two arms:

- Preventive arm – represents the surveillance mechanisms under which nations are required to submit macro-economic reports based on which Commission evaluates the adherence to deficit and debt limits. This ensured that nations have string budgetary mechanisms in the medium term to ensure compliance.
- Corrective arm – includes the tools to direct governments to keep their deficits and debt under check (e.g EDP).

The report submitted by member nations is examined by the European Commission. The Commission then suggests recommendation including labeling of countries in Excessive Deficit to the Council of Economic and Finance Ministers (ECOFIN). The Council comprising on Member States approves the recommendations based on majority. It had the power to make changes – strenghting/weakening the procedures recommended. There were many instances where recommendations of the Commission were weakened by the ECOFIN. Generally, the smaller states suffered and the bigger ones managed to wriggle their way out.

In 2005, succumbing to the pressure from France and Germany SGP, was amended and certain provisions were relaxed with the explanation of ensuring wider compliance. Under the new framework, country-specific Medium Term Budgetary Objectives (MTO) were calculated per its current fiscal position and economic cycle and each nation could set its own MTO. MTOs were in term of improving the structural deficit (government deficit adjusted for economic cycles and one-off events). The process of identifying countries was Excessive Deficit was changed and made more relaxed. Now nations now had more time to comply with the convergence criteria.

However, most of the countries failed to meet their MTO and kept pushing the targets to future years.

Greece MTO Targets as set out in yearly stability and growth update reports: -

Year	MTO target for Cyclically adjusted balance
2005	Achieve 3% cycle adjusted gap by 2008
2006	Achieve 2.2% cycle adjusted gap by 2008
2007	Achieve 2.5% cycle adjusted gap by 2008
2008	Achieve 2.2% cycle adjusted gap by 2011
2009	Achieve 4% cycle adjusted gap by 2011

Similar was the situation with many other nations including bigger nations like France and Germany.

Although the pact was intended to maintain fiscal discipline among the EMU nations, around 50% nations representing 80% of Euro zone's GDP were had excess deficits in 2005. The two big nations – France and Germany were in continuous violations of the recommendations given by EMU to lower their deficits. (Hallerberg, 2013)

Reforms made in 2005, gave countries further levy to set their targets which resulted in complacency on member nation's side to meet the convergence criteria.

Above analysis shows the SGP was a stop-gap measure which was flouted by many member nations and no corrective actions were taken against defaulting nations till European debt crisis happened in 2011.

7. Future State

7.1 Past Efforts

Since the start of Euro crisis in 2010, the member states of the European Union have come together several times to bail out nations on the verge of default. In 2010, Greece was funded with a €100bn bailout package to prevent it from defaulting on its debt payments. At the same time, the European Financial Stability Facility or EFSF was established as a special purpose vehicle to provide financial assistance to the member states in situations of default. Created as a temporary crisis solution at the time of its inception, the facility issued EFSF bonds and other debt market instruments to extend loans to Greece, Portugal and Ireland. The EFSF continues to operate to receive interest payment on loans and service the debt.

While the EFSF was created as to extend financial support on a temporary basis, another mechanism was put in place to provide financial assistance in the event of future crisis. This scheme, called the European Financial Stabilisation Mechanism (EFSM), is a €60bn bailout package guaranteed by the EU budget. This means that while the interest and principal payments are serviced by the member states, in case of a default, the European

Union will provide the required support. In addition to the €60bn loan from the EFSM, the IMF also extended a €250bn loan that setup a safety net of €750bn. Under the Treaty Establishing the European Stability Mechanism, the financial support provided by these organizations came under a single umbrella, called the European Stability Mechanism.

Greece, Portugal and Ireland have been the major recipients of several bailout packages totalling over €500bn since the crisis started in 2010. However, it has been often recognized that these measures have been stop-gap and do not address the longer term need of a structural reform to avoid future crisis.

In the next section, we combine our understanding of the theory of optimum currency area with the structural differences between the member states of the Eurozone countries to explore possible scenarios available to the European Union to tackle the prolonged Eurozone crisis. In the previous sections, we have analysed the mechanisms in place for erring in the implementation of the convergence criteria. We tie all these aspects to understand each scenario and its implication on the member states.

7.2 Exit from the Eurozone

While the theory of optimum currency focusses extensively on the need for a fiscal union and labour mobility as pre-requisites for the smooth functioning of a common currency area, throughout the crisis there was speculation of the member states leaving the Eurozone and defaulting on its payments.

The primary argument for the Eurozone to break up is that by taking away the ability to control exchange rates and interest rates, the adjusting mechanism to counter an asymmetric shock was removed (Stiglitz, 2016). The European Central Bank had the mandate of tackling inflation. However, the application of a common monetary policy to an economically disparate region meant growing unemployment in certain regions, while other prosper. In the absence of these adjusting mechanism, an alternative to the growing disparity would be for the debtor nations to increase their productivity. However, none of the Euro members have yet adopted concrete measures in this direction. Thus, an immediate and effective solution would be to break up from the Eurozone and adopt its own currency.

The academic literature on how a country can exit from a monetary union and adopt its own currency is limited and mostly based on empirical data. In his analysis, Rose concluded that countries that exit a monetary union are more likely to have large GDP and little macroeconomic volatility (Rose, 2006). However, most of these exits were not forced out of inability to pay debt, but based on the growing economic independence. Hence, we believe that this might not be a valid comparison in the case of Eurozone.

Per Bootle, leaving the currency union would entail two distinct events (Bootle, 2016). Firstly, in the case of Greece, the new currency would have to be allowed to devalue to reflect the high current account deficit of Greece and make its export more competitive. Secondly, all the domestic wages and prices would have to redenominated in the new currency. However, Bootle also highlights the legal problems that arise from this process. Unlike the case of a pure devaluation or redenomination, in this case there will be people who would gain and lose in the conversion process.

Bootle further explores the practical issues in the procedures involved in exiting the euro. There are practical considerations around how the decision should be announced, how the conversion should be set initially and how to ensure a stable exchange rate is established.

We believe that besides these pre-conversion factors, the monetary authorities will also have to consider the exchange rate regime to be adopted, especially if a free-float regime is considered. Currently, private investors have invested in Greece on the back of the belief that in case of a potential default, the European Central Bank and the creditor member states would intervene. However, in case the Greece and other debtors decide to exit the Eurozone, the markets might panic leading to capital outflows. After the adoption of a new currency, these capital outflows might become more pronounced in the absence of the existing support that Greece gets by being part of the union. This might lead to rapid depreciation of the new currency and create a strain on Greece's ability to meet its debt obligations. Thus, we recommend either strict capital controls be implemented before the announcement of Greece's breakup from the Eurozone or a pegged float may have to be adopted.

7.2.1   Legality of a withdrawal

The EU Treaties on the creation of the Euro do not mention the procedure for withdrawal from the Eurozone. According to legal experts, the only way to exit the currency union is being leaving the European Union itself. Thus, to avoid such a scenario would require the member states to congregate and negotiate on new treaties to support an smooth exit.

7.3 Orderly Default

The Euro project was started as a political symbolism of Europe's integration. Given this backdrop, there will be a lot of resistance in the political circles to allow Greece to leave the Eurozone. There would also be concerns around the breakup of the entire Eurozone if one country were to leave the Eurozone. Thus, another possibility that is often considered is an orderly default.

Broin highlights that during the debt crisis, there exist two ways to provide support to the state in distress – a direct transfer from the creditors to the debtor nations or allowing default (Broin, 2012). However, the European treaties prohibit a direct transfer, thus leaving the option of default. In the case of a default, to prevent panic in the financial markets and capital outflows, it would be imperative to have an orderly default. This would

entail bringing together all the debtholders, both private and public sectors, to accept haircuts on their holdings. This would help establish expectations of the principal to be recovered. After negotiation with the private sector, the remaining hit can be taken by public institutions such as the IMF and the ECB.

In the past, all the bailouts have been accompanied with strict imposition on fiscal spending and austerity measures. These have not allowed the debtor economies to propel investments and break out of the spiral of low growth and low productivity. Therefore, we believe that along with an orderly default, it is imperative to encourage Greece to fuel investment on public spending. However, these investments need to be controlled and directed and be regularly monitored to ensure that the investments are not splurged on uneconomic projects.

7.4 Fiscal Union

Fiscal Union was identified long ago as one of the important criteria for an OCA by McKinnon. With limited monetary freedom, member nations have limited avenues to manage fiscal deficits and reduce government debt. In such a situation, fiscal union plays an important role of providing cushioning in bad times.

The 2011, European debt crisis exposed the structural defects in the current EMU structure. It formally recognized the importance of fiscal union for a successful Euro Union in 2015 by establishing the European Fiscal Board (EFB). EFB was created to provide recommendations on improving fiscal integration among EMU members. Post the debt crisis, the European Commission has taken few steps to move towards a more integrated fiscal union.

Major constituents of a fiscal union and steps taken by European Commission till date are as follows:

- **Rules and coordination (shared sovereignty)**
  The need for fiscal coordination in a monetary union arises from the spill-overs resulting from disparate policy decision across the member states. According to Thirion, coordination can be ex-ante via rules or post-ante through natural integration (Thirion, 2017). He highlights the Stability and Growth Pact as an example of the ex-ante coordination. However, since ex-ante coordination requires adherence to a rule, it inherently assumes that all the member states of the fiscal union would be at par economically. This was clearly not the case when the Eurozone was established and hence a common rule such as a fixed debt-to-GDP ratio cannot be commonly applied. Thus, it may be more prudent to adopt rules by categorizing member states or relying on ex-post coordination.

- **Banking Union** – In 2014, Single Supervisory Mechanism (SSM) was introduced in Eurozone which granted ECB the power to supervise and monitor fiscal stability of the banks. This would standardize the rules for banking supervision across the Eurozone. Also, Single Resolution Mechanism (SRM)

was established under which common resolution fund was created (funded by industry) to bailout bondholders and depositors in case of a bank insolvency.

These steps are in the right direction towards a banking union. However, lack of joint euro-wide fiscal backstop like deposit insurance remains an area of concern.

- **Common Crisis Management Mechanisms** – Currently EMU members have limited capability to manage fiscal crisis. They cannot allow depreciation of their domestic currency to make exports competitive, nor can they print money to pay off government debt. Crisis management mechanism was currently in the original EMU architecture. Post the debt crisis, EMU has introduced a few crisis management tools. Firstly, ESM, which provides financial support to distressed nations. Secondly, Outright Monetary Transaction (OMT) which enables ECB to be the lender of last resort in certain situations and subject to strict conditions.

- **Fiscal Insurance –** Fiscal insurance includes creation of rainy-day funds and euro-wide unemployment insurance scheme.

  Rainy funds are temporarily transferred to member nations during situations of distress. Depending on business cycle – nations are net contributors or beneficiaries of the fund. A cyclical shock fund would provide temporary macroeconomic stability in case of economic shocks.

  Creation of euro-wide unemployment insurance scheme would enable better integration of European labour markets. National unemployment schemes may fail during periods of recession and widespread unemployment. In those situations, a common insurance would prevent negative shocks by transferring funds to unemployed and maintaining minimum household income.

8. Conclusion

Our study of the OCA through the work of Mundell, McKinnon and Kenan and analysis of the broader economic parameters of the member states reveals that the members of the European Union did not constitute an optimum currency area. Further, the member states were pressurized to meet the convergence criteria before the joining of the Eurozone. This led to the case where Greece reported incorrect numbers to become part of the monetary union.

Moreover, even after becoming members of the Eurozone, member states consistently did not meet the convergence criteria. The Stability and Growth Pact which was intended to ensure compliance to convergence criteria was not strictly implemented. Multiple amendments were made to it that eased the strict guidelines put in place initially, as there were constant breaches by some of the more prosperous states, including Germany and France.

These shortcomings were a pre-cursor to the 2010 Euro crisis that has been prolonged by the lack of structural support required for a monetary union to function effectively. Instead of creating support institutions, focus has been on stop-gap measures whenever the debtor countries have approached default. However, these measures are not sustainable and given that strict conditions are imposed along with the financial support extended, recovery from the cycle of low growth seems unlikely for the debtor countries.

The Euro project was started as a political project to further the integration of Europe. However, the flawed design has caused a greater divide that threatens the existence of the European Union itself. In light of the impending crisis, the Eurozone members must come together and adopt measures that will change the constant need for bailouts and drive the Eurozone out of the prolonged recovery. In our opinion, given the political importance of this project, the establishment of a fiscal union would be the first step in this direction. This can be followed by an orderly default, if the need arises. However, given the volatile political situation and growth of 'nationalism' in Europe, these measures might face hurdles and will require greater diplomatic efforts.

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