Optimum Currency Area Theory and EMU: An Analysis of the Eurozone’s Development, Crisis and Future

Fearghal Crowley

Bachelor of Arts in Politics and Public Administration
Title Page

Name: Fearghal Crowley

ID Number: 10140255

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Internal Supervisor: Dr. Donal Palcic

External Examiner: Dr. Muiris MacCarthaigh (QUB)

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Abstract

Following Europe’s decision to move towards Economic and Monetary Union (EMU) the theory of Optimum Currency Areas (OCA) emerged as a popular tool of analysis. The theory was used to determine which European countries together constituted an OCA; it also prescribed the ideal conditions that should exist between countries to ensure a sustainable currency union. Using OCA theory as a framework of analysis this paper asked what design flaws were highlighted in the EMU prior to its formation? How did these flaws contribute to the Eurozone’s current economic woes? And what reforms are needed to ensure a more sustainable Eurozone into the future? Early literature highlighted several flaws in the EMU not least that it was not an OCA. Evidence presented in this study suggests EMU has had asymmetric effects on its members while it also lacks adjustment mechanisms to compensate for this. The fact that the Eurozone did not constitute an OCA, in part, contributed to the current economic malaise in the area. This paper argues that EMU is a worthwhile endeavour that should not be abandoned. Thus reforms in the shape of a banking union and fiscal union are means by which the Eurozone can become an OCA thereby ensuring its future prosperity.
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Finally I want to express my sincerest gratitude to my family, in particular my parents, without their support my four years at the University of Limerick would not have been possible.
Declaration

I hereby declare that this project is entirely my own work, in my own words, and that all sources used in researching it are fully acknowledged and all quotations properly identified. It has not been submitted, in whole or in part, by me or another person, for the purpose of obtaining any other credit / grade. I understand the ethical implications of my research, and this work meets the requirements of the Faculty of Arts, Humanities and Social Sciences Research Ethics Committee.

Fearghal Crowley

Date: 17th February 2015
## List of Abbreviations

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<th>Description</th>
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<tbody>
<tr>
<td>ECB</td>
<td>European Central Bank</td>
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<tr>
<td>EC</td>
<td>European Community</td>
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<td>EDA</td>
<td>European Debt Agency</td>
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<td>EDP</td>
<td>Excessive deficit procedure</td>
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<td>EMU</td>
<td>Economic and Monetary Union</td>
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<td>ERM</td>
<td>Exchange Rate Mechanism</td>
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<td>ESM</td>
<td>European Stability Mechanism</td>
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<td>EU</td>
<td>European Union</td>
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<td>FDI</td>
<td>Foreign Direct Investment</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<tr>
<td>LOLR</td>
<td>Lender of Last Resort</td>
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<tr>
<td>NCB</td>
<td>National Central Bank</td>
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<tr>
<td>OCA</td>
<td>Optimum Currency Area (used interchangeably to refer to an optimum currency area and optimum currency area theory)</td>
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<tr>
<td>OECD</td>
<td>The Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OMT</td>
<td>Outright Monetary Transactions</td>
</tr>
<tr>
<td>PIIGS</td>
<td>Portugal, Italy, Ireland, Greece and Spain</td>
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<tr>
<td>SGP</td>
<td>Stability and Growth Pact</td>
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<td>SRM</td>
<td>Single Resolution Mechanism</td>
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<td>SSM</td>
<td>Single Supervisory Mechanism</td>
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Chapter One – Introduction

The European Economic and Monetary Union (EMU) was formed in 1999 with euro coins and notes introduced in 2002. A prime concern in advance of its creation was whether 11 different countries which controlled their own monetary policies, fiscal policies and currency could be somehow brought together as one currency area. Various authors pointed to flaws in the Eurozone’s design including a lack of suitable adjustment mechanisms, asymmetries between the potential members with concerns also expressed over the stability and growth pact (SGP), and the ECB’s narrow role among others. Following the global financial crisis in 2008 contagion spread to the Eurozone and by 2010 it had descended into the most serious crisis in its short history (Eichengreen 2012).

Following Europe’s decision to move towards EMU the theory of optimum currency areas (OCA), which had remained dormant since the 1970’s, was resurrected as a means of analysing the EMU project. This theory has two aims; firstly it asks what the optimal area for a single currency is. Secondly it asks what are the criterion countries should satisfy to ensure the benefits of monetary union are greater than the costs (De Grauwe 2006). As noted OCA theory is a way to think about a currency unions prospects, and right from the beginning it had pointed to serious concerns in the Euro project (Krugman 2012). Mongelli (2008) lists the following as the essential OCA properties:

- Price/Wage Flexibility (Friedman 1953)
- Factor Mobility (Mundell 1961)
- Financial Market Integration (Ingram 1962)
- Economic Openness (McKinnon 1963)
- Production Diversity (Kenen 1969)
- Fiscal Integration (Kenen 1969)
- Similarity of Inflation Rates (Fleming 1971)
**Section 1:1 Research Aims**

This project uses OCA theory as a framework for analysing developments in the Eurozone since 1999. It has three primary objectives:

1) It seeks to discover the flaws in the Eurozone’s design highlighted before its formation
2) It asks if a failure to meet the OCA criterion contributed to the current Eurozone problems? and
3) Suggests reforms which can move the EMU closer to the ideals of an OCA

It is argued that OCA theory helps identify a number of design flaws in the Eurozone such as a lack of symmetry which contributed to the crisis as well as a lack of flexibility in terms of adjustment mechanisms. For the Eurozone to survive and thrive as a single currency it should operate as an OCA thus reforms are needed.

**Section 1:2 Methodology**

This paper applies OCA theory to examine developments in the Eurozone since 1999. While the theory has been subject to much criticism as Snaith (2014) notes this “logical redundancy is only the case if we genuinely regard OCA as being solely of value as a predictive theory” (p.189). OCA theory instead possess a logical power and aesthetic appeal as a narrative on the Eurozone attractive to commentators (Dyson 2000). Similarly Mongelli (2008) suggests the theory has great merits as an organising device and as a catalyst of analysis. Thus OCA theory provides a useful framework within which the Eurozone’s development, current crisis and future can be examined. A review of how the Eurozone developed reveals the flaws in the Eurozone’s design and also what OCA criteria it failed to meet upon its creation. If these missing elements are also the criteria as laid out by OCA theory then the theory potentially offers a strong narrative to what went wrong. Once the missing elements have been identified and how they contributed to the crisis OCA theory also points to a way forward for the Eurozone.
Section 1:3 Structure of the project

The project is structured as follows: in chapter two OCA theory will be discussed. In section one OCA theory is broken into the three broad categories of symmetry, flexibility and integration as suggested by De Grauwe (2006). Section two examines the costs and benefits of currency unions. Section three examines two paradigms on an OCA’s dynamic affects; these are the specialisation hypotheses and the endogeneity of OCA hypotheses.

Chapter three reviews the literature from the pre-EMU period. Much of this literature was guided by OCA theory or by a similar logic and asked what would happen once the currency union was formed. This review reveals remarkable foresight in the potential for problems to emerge in the Eurozone given its design flaws. For instance the SGP was regarded as unworkable and likely never to be enforced, concerns were expressed over asymmetries in inflation rates with concerns also expressed over the narrow role of the ECB.

Chapter four then applies OCA theory to examine developments in the Eurozone since 1999. This is done under the three broad OCA categories of symmetry, flexibility and openness. It is found that a single monetary policy combined with financial market integration exacerbated asymmetries between members contributing to the crisis and also led to asymmetric adjustment problems. The Eurozone also lacks sufficient adjustment mechanisms and thus lacks flexibility. Eurozone economies are very open but less conclusive results are found for the euro’s effect on intra-Eurozone trade.

Chapter five then examines the means by which the Eurozone could move closer to forming an OCA. This chapter is arranged around Pisani-Ferry (2012) and Obstfelds (2013) ideas of a new impossible trinity in the Eurozone. To solve the Eurozone’s problems a solution to the trilemma problem must be found. One approach presented in this chapter is based around increased integration consisting of banking union, fiscal union and a lender of last resort function (LOLR) for sovereigns. It is argued that for the Eurozone to survive and prosper it
must function like an OCA, although controversial and difficult to achieve a banking union, fiscal union and a LOLR function is one way this could be done. Chapter six concludes.
Chapter Two – Optimum Currency Area Theory

The theory of Optimum Currency Areas (OCA) emerged from debates on the merits of flexible exchange rate regimes versus fixed exchange rate regimes, it added to the debate by highlighting the importance of economic characteristics such as factor mobility, product diversification, adjustment mechanisms and trade openness in determining the costs and benefits of the different exchange rate regimes (Dellas and Tavlas 2009). Various inconsistencies and problems in the models used contributed to its demise in the 1970s. However it re-emerged with newer forms of OCA theory not just concerned with static economic characteristics but also with the credibility and dynamic aspects of alternative exchange rate regimes (Dellas and Tavlas 2009). Section 2:1 examines the economic characteristics considered essential for an OCA. Section 2:2 discusses the costs and benefits associated with currency areas. Section 2:3 explores the dynamic effects of OCA’s.

Section 2:1 OCA Conditions

The fundamental conditions required to form and maintain an OCA were first described by Mundell, Mckinnon and Kenen. De Grauwe (2006) labels these conditions as Flexibility, Symmetry and Integration/Openness. How these conditions interact is shown in fig 2:1. Areas to the right of the OCA line signal the combinations of symmetry, integration and flexibility required to firstly form and sustain an OCA, and secondly to ensure the benefits will outweigh the costs.
The Left hand diagram in figure 2:1 shows the interaction between symmetry and flexibility. The OCA line is downward sloping because the decline in symmetry raises the costs of a currency union thus more flexibility is required to offset the lack of correlation. If the economies of a monetary union have similar economic structures economic shocks should have symmetrical effects across the union. Symmetry relates to Kenen’s (1969) criteria that members of a monetary union are “Countries whose production and exports are widely diversified and of similar structure” form an OCA (Baldwin and Wyplosz 2012, p.414). Meeting this criteria helps reduce the probability of asymmetric shocks (Cesarano 2013).

The right hand diagram in figure 2:1 shows the interaction between symmetry and integration. Countries having symmetry of shocks and that trade heavily with each other will be on the right of the OCA line, the more integration the more trade there will be between members. Integration relates to McKinnon’s criterion (1963) that says “countries very open to trade and which trade heavily with each other” forms an OCA” (Baldwin and Wyplosz 2012, p.414).

The less symmetry there is the more flexible economies will have to be, flexibility minimises adjustment costs in a currency union (HM Treasury 2003). Flexibility relates to Mundells (1961) criteria for production factors to be fully mobile across borders. For instance there should be sufficient cross-border labour mobility between members to offset against
asymmetric shocks. A second aspect of the flexibility condition relates to prices and real wages \( \frac{w}{p} \). Countries with flexible \( \frac{w}{p} \) form an OCA because it allows for easier adjustments. Mongelli (2002) attributes price/wage flexibility to Friedman (1953).

Figure 2:2 is a hypothetical two country model showing the effects of an asymmetric shock in a monetary union. A negative demand shock hits France while German demand increases causing a fall in GDP and increasing French unemployment, the demand increase puts inflationary pressure on the German economy. In France the shock causes an increase in real wages because prices fall while nominal wages remain constant. Wage flexibility in France allows the economy to adjust, for instance if French workers permit nominal wages to fall this allows the real wage to adjust and inflation falls to \( \pi2 \). This makes the French economy more competitive relative to Germany thus increasing demand in France and easing inflationary pressure in Germany. With wage flexibility both economies can return to their original position.

Another criterion relates to fiscal transfers which involves income redistribution from favourably shocked to adversely shocked regions (Sala-i-Martin and Sachs 1991). This criterion states countries that agree to compensate each other for shocks form an OCA (Baldwin and Wyplosz 2012). Other conditions considered important for OCA symmetry
include financial market integration and similarities of inflation rates (Mongelli 2005). Integrated financial markets help because by unifying the “capital markets of its member countries, a monetary union can make those countries more like regions and thus reduce the impact of asymmetric shocks” (Kenen 2003, p.152). Table 1 shows how the three broad OCA conditions as defined by De Grauwe are interlinked with the main OCA criteria.

Table 1

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<tbody>
<tr>
<td>Symmetry</td>
<td>Kenen: Product Diversification and Structural Similarity</td>
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<td>Fleming (1971): Similarity of Inflation Rates</td>
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<td>Flexibility</td>
<td>Mundell: Factor Mobility</td>
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<td>Friedmarc: Price/Wage Flexibility</td>
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<td></td>
<td>Kenen: Fiscal Integration</td>
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<td>Integration/Openness</td>
<td>McKinnon: Openness to Trade</td>
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Section 2.2 Costs and Benefits of an OCA

The costs of currency unions were very influential in the earlier phase of OCA theory which Mckinnon (2004) labels “Mundell I”. Under Mundell I countries should only form a currency union where the OCA conditions are satisfied. Mundell I assumes short run price and wage stickiness and is based on the idea of an employment/inflation trade off which also assumes elastic supply once demand is stimulated (Goldberg 1999). The most significant cost associated with currency unions is the loss of independent monetary policy meaning the loss of a domestic instrument of macroeconomic stability and an adjustment mechanism (HM Treasury 2003). Members lose control over interest rates and the money supply while exchange rates adjust to suit the conditions of the union as a whole, not the specific needs of member states. While a single currency can prevent speculative attacks, it also means a country has almost no policy option available in the face of negative asymmetric shocks (Salvatore 2002).
The OCA criteria requires labour market flexibility, but Mundell I assumes price and wage stickiness meaning members hit by an asymmetric shock will not be quickly able to regain competitiveness. De Grauwe (2009) notes how dissimilar labour market institutions can lead to asymmetric flexibility between currency union members. Also a currency union may lack sufficient labour mobility to offset unemployment increases. Without flexible labour markets and independent monetary policy countries may be better off under a flexible exchange rate regime (Mundell 1961). Under Mundell I a currency union is viable only where sufficient symmetry of shocks and trade integration exists between members.

The costs associated with Mundell I were based on a short-run constant Phillips curve (De Grauwe 2009). A constant Philips curve suggests a choice exists between inflation and unemployment (Leddin and Walsh 2003). A constant curve also means a country with sticky prices and labour market rigidity can use monetary policy tools to prevent increased unemployment in the short run at least. However in a currency union it might have to accept lower inflation and higher unemployment than it would like.

Mundell I is criticised because the Philips curve is not stable meaning it shifts upwards when inflation expectations increase (De Grauwe 2009). Higher inflation rates would have to be tolerated without necessarily reducing unemployment. Policy makers instead have a choice between different inflation rates, not inflation and economic activity (Artis cited in Mongelli 2002, p.14). Hence recent literature views inflation prevention as the main objective of a central bank with business cycle adjustments a secondary objective, because in the long run the Philips curve is vertical (Dellas and Tavlas 2009). Thus the loss of monetary policy aimed at fine tuning the economy cannot be considered a loss because in the long run such monetary stimulus leads to inflation, ultimately structural reforms will be required.

Mundell I is also criticized for over emphasising the benefits of devaluations for macromonetary adjustment (EC Commission 1990). Devaluations can have zero sum effects leading to counter devaluations and in turn a spiral of devaluations (De Grauwe 2002). Economic agents will view persistent devaluations as a signal that the country has a strong inflation preference instead of structural reforms in the face of negative shocks. Further
changes in nominal exchange rates may not necessarily lead to real exchange rate changes (Goldberg 1999). Thus under the revised conditions of Mundell II (McKinnon 2004) the loss of monetary policy is not considered as important because in a world of free capital mobility the exchange rate ceases to be a source of macroeconomic stability. Under Mundell II losing the exchange rate as an adjustment mechanism is not seen as a cost but as a benefit that eliminates a source of asymmetric shocks (De Grauwe 2006).

**Benefits of a Monetary Union**

Computing with precision the extent of any monetary union benefits is very difficult, the best that can be done is to gain an understanding of where the benefits are likely to reside (Wyplosz 1997). Countries might be willing to relinquish control of various economic tools, firstly because a monetary union eliminates exchange rate risk and uncertainty between its members. Removal of exchange rate uncertainty could stimulate increased trade between members and thus increased economic activity. Single currencies ensure greater price transparency making it easier for consumers and business to compare prices across the union enhancing the pro-competitive effects of the single market (EC Commission 1990). Price transparency also discourages price discrimination, decreases market segmentation and leads to increased competition (Mongelli 2002).

A monetary union encourages price stability which means macroeconomic stability. If macroeconomic stability is ensured it should lead to increased investment because of reduced uncertainty (HM Treasury 2003). Price stability is important to historically high inflation prone members as the monetary union ties them to low inflation goals thereby enhancing their credibility. This should also allow inflation prone members to enjoy a degree of price stability they were unlikely to have on their own (Leddin and Wash 2003). Monetary union also gives access to broader financial markets which allied to price stability allows members to benefit from lower and more stable interest rates.
Section 2.3 Endogenous versus Specialisation effects of OCA

There’re two opposing views on an OCA’s dynamic effects, Mongelli describes these as forward looking OCA arguments (2005). Both stem from Mundell II OCA theory. Krugman (1993) postulates that OCA’s encourage specialisation which can have negative effects on the union. Outside a currency union firms have an incentive to stay in other countries to avoid negative exchange rate movements, eliminating these risks means firms benefit from scale economics (Leddin and Walsh 2003). For Krugman this poses a problem as increased integration may lead countries to specialise in certain sectors thereby reducing their economic diversity, if each country specialises correlations of income will decrease thus increasing asymmetric shock risk. Paradoxically increased integration and trade induced by OCA could lead to more not less structural differences between countries (Krugman and Venables 1996). Hence even where members satisfy the static criteria to form an OCA (Point A in Figure 2.3) the specialisation induced by increased integration could reduce symmetries between members and move them to the left (Point B) of the OCA line.

In contrast Frankel and Rose (1998) suggest OCA’s can have endogenous effects. The only pre-condition is that countries have or can develop strong trade links with one another, even where the symmetry and flexibility conditions are not met simply by forming the union the effects of trade liberalisation and integration can move the countries to the right of the OCA line (ibid 1998). Because a currency union encourages greater integration this in turn leads to
increased trade between members; the increased trade then increases the income correlations of the members. This self-fulfilling effect pushes the members to the right of the OCA line.

Figure 2:4 shows an OCA’s endogenous effects. At point A Countries form a currency union despite not meeting the OCA criteria. Increased trade then produces greater income correlation between the countries which moves them to the right of the OCA line (Point B). The act of forming a currency union creates an OCA. In contrast to the specialisation paradigm the endogeneity of OCA view suggests the static criteria can be satisfied due to an OCA’s dynamic effects. The endogeneity view suggests a country is more likely to satisfy OCA criteria ex post rather than ex ante, specialisation suggests a country is more likely to satisfy the criteria ex ante but may not satisfy the criteria ex post (Broz 2005).
Chapter Three – Review of the Pre-EMU Literature

This chapter focuses on literature written prior to the final stage of the EMU’s completion in 2002. Much of this literature is either guided by OCA theory or by a similar logic which questions what happens when currency unions are formed. Articles criticising OCA theory and those authors who used it to analyse the EMU are also discussed. This review suggests mixed opinions on the potential gains and losses from EMU, and also conflict over how gains and losses were being measured. Section 2:1 looks at the negative discussion around the impact on fiscal policy, section 2:2 is on the gains from EMU, section 2:3 reviews some applications of OCA theory, section 2:4 examines critiques of OCA theory and section 2:5 discusses the impact of increased integration on financial stability.

3:1: Impact on Fiscal Policy

Eichengreen (1996) focused on the excessive deficit procedure (EDP) and the Stability and growth pact (SGP). He is critical of the EDP and its 3% of GDP deficit limit arguing its strictness would lead to pro-cyclical fiscal policy. This would be especially acute in downturns with governments forced to cut spending and raise taxes so as to comply with restrictions, with no monetary policy and restricted fiscal policy members would struggle when faced by business cycle fluctuations. In this case fiscal policy in the EMU could have destabilising effects when faced with recession and rising unemployment (Obstfeld 1997). Sala-i-Martin and Sachs questioned the creation of a currency union without a federal insurance scheme noting it could very well lead to the projects failure (1991). Eichengreen and Wyplosz (1998) argued that the SGP would never be enforced with face saving agreements used instead. They also argued that pre-occupation with the SGP was detracting from more important labour market reforms, reforms which would be more appropriate for enhancing growth and economic flexibility.

Wyplosz (1997) noted the ambiguous role of fiscal constraints, while they might help some countries control unsustainable deficits, an insistence on price stability combined with rigid fiscal controls would play a role in slowing Eurozone growth. Tobin (2001) notes the fiscal rules made no distinction between current and capital expenditures. US states in contrast have
much greater freedom and although they apply their own restrictions on current account
deficits, states are free to finance capital expenditures on for example schools and highways
by borrowing.

Calomiris (1999) raised concerns over a lack of credible constraints to limit the long run
monetization of deficits. Soft money countries might use large deficits as a threat to exit the
EMU unless hard money countries agreed to joint monetization of deficits. Two expenditures
could lead to excessive fiscal deficits, firstly changing demographics could increase the
number of insolvent pension schemes putting pressure on governments to bail them out. A
second source could stem from having to bail out the banking system. Calomiriris outlook on
the project is a negative one predicting a weak and non-permanent Euro currency.

3:2: Gains from EMU

A common argument in favour of EMU lay in the potential for increased intra-Eurozone
trade. Rose (2000) argued that the importance of a common currency to trade was not fully
appreciated. Authors with pessimistic views on the EMU’s trade increasing potential
primarily focused on trade gains from reductions in exchange rate volatility, measuring trade
gains on this variable produced less positive results. Rose analysed various data and found
that a common currency is a very important variable in explaining the greater trade that takes
place within a country than between countries with different currencies. “Money facilitates
trade in its role as both a unit of account and a means of exchange, fewer more widely used
moneys facilitate more trade” (Rose 2000 p.24). Building on his work with Frankel (1998) he
argues that EMU could increase intra-Eurozone trade in turn making EMU more sustainable
by increasing the synchronisation of the Eurozone’s business cycle.

The EU commission’s report from 1990 argued that EMU could bring substantial gains for its
members. The single currency eliminates nominal exchange rate variability and uncertainty,
it also eliminates transactions costs from exchanging currencies and induces price stability
from low inflation. EMU could produce not only considerable static gains but also dynamic
gains such as high and sustainable growth rates. While countries lose revenues from
seignorage this would be compensated for by lower interest rates making the servicing of debt easier.

The commission played down the costs suggested by traditional OCA theory. Firstly the loss of the monetary and exchange rate instruments were being exaggerated as countries were already members of the ERM. On asymmetric shocks the report suggested EMU would have endogenous effects which would reduce the occurrence of country specific shocks. This would be especially true where shocks are induced by exchange rate volatility and uncoordinated monetary policy. Finally the increased financial flows produced by EMU would help absorb economic shocks.

3:3: Application of OCA theory pre-EMU

Was Europe an OCA prior to the formation of the EMU? Wyplosz (1997) discussed various studies that dealt with OCA criteria. At the time Europe scored well in terms of openness compared with the US and Japan having import/export ratios of 11% and 9% respectively. Larger European countries such as Germany and France had import/export ratios above 20%. Smaller European states such as Ireland and Belgium had ratios above 70% suggesting the exchange rate was a less useful policy tool due to their openness. Wyplosz cites several studies which found European economies to be well diversified and similarly structured, a general message was that there is more co-movement in macroeconomic variables among European countries than between European countries and the US and Japan. However there was little labour mobility between European countries. Compared to the US Eudey (1998) noted how European markets do not share the same flexibility with European workers less willing to accept cuts and more likely to remain in areas of high unemployment.

Bayoumi and Eichengreen (1996) examined the preparedness of potential EMU members, they measured this by constructing an OCA index. The Index measured a countries correlation vis-a-vie Germany finding the Netherlands, Austria, Belgium and Ireland to be most correlated to the German Economy. A second group including France had the lowest correlation while a third group including Italy and Spain were gradually converging towards
EMU. The findings suggested France was motivated to join the EMU by political not economic reasons, they also argued that EMU together with the single market can constitute a virtuous self-reinforcing cycle.

As discussed symmetry of income, shocks, inflation etc are important OCA criteria. Ed Stevens (1999) noted the problem of setting a suitable interest rate for members who were at differing stages of economic growth. Some such as Germany and France had low inflation and low growth meaning lower interest rates were favoured. In contrast countries such as Ireland and Spain had higher inflation meaning higher interest rates were more appropriate. A principal reason why many economists doubted the EMU project related to the potential conflict over a monetary policy which would benefit some members while proving costly for others (Frieden 1998).

However Stevens suggests these difficulties were exaggerated as these asymmetries apply to regions within countries. Further regions in the US monetary union experience different inflation rates and growth rates while at the same time the Federal Reserve controls US interest rates. Feldstein (1998) on the other hand criticised the attempt to impose a single interest rate and fixed exchange rates because unlike the US European countries are defined by sticky wages, low labour mobility and the EMU lacked a fiscal redistribution mechanism (cited in Jonung and Drea 2009). Lacking these adjustment factors in the union could result in unbearable pressure in the event of asymmetric shocks (Fink and Salvatore 1999). It was predicted that a lack of symmetry could manifest itself in other ways. Frieden (1998) noted how recessions in member countries could produce conflict as some countries put pressure on the ECB to loosen monetary policy to stave off stagnation, while monetary hard-line countries wary of inflation fight against this. Freiden also notes the potential for difficulties to arise as localised problems emerge in weak financial systems leading to conflict over who should pay for bailouts.
3:4: Criticisms of OCA Theory

Some authors questioned OCA theory especially the traditional form and its suitability for analysing the EMU. Buiter (1995) described the OCA literature has being “woefully inadequate and confused” (p.31). This is because the variables being measured can lead to misleading conclusions on what constitutes an OCA. Firstly Buiter plays down the importance of labour mobility arguing its role is over-emphasised. Secondly asymmetric shocks are not an argument against a currency union if the shock is a financial one and there is a high degree of capital mobility. Thirdly significance was attributed to monetary policy that goes well beyond its powers. Buiter thus argued there were no convincing economic objections left to EMU for most potential members with Greece considered the most unlikely member.

Jonung and Drea (2009) reviewed the pre-EMU literature from US economists and academics. They found a majority of the literature was critical of the EMU project. They suggest this was partly due to the use of traditional OCA theory which led to criticisms of the project for a number of reasons. Firstly traditional OCA literature had a negative bias as it stressed the costs of monetary unions while ignoring their dynamic aspects. As was noted the economic costs and benefits were miss-measured, largely because it is difficult to measure the long run dynamic effects with accuracy (Freiden 1998: Bayoumi et al 1997). Secondly they tended to apply a static ahistorical approach by comparing the US with potential EMU members, leading to conclusions that Europe was less flexible and less integrated and did not constitute an OCA. Thirdly European countries did not really face a choice between the two extremes of fixed and flexible exchange rates with flexible rates never really an option for a number of countries.

3:5: Integrated Markets and Financial Stability

In their report Prati and Schinasi (1999) examined how the Eurozone’s design would affect financial stability finding a range of undesirable scenarios could arise. For instance, because EMU would foster more integrated financial markets and banking systems, crisis would develop more rapidly and with less transparency than in a smaller national market. In a
situation then of widespread insolvency triggered by a run on liquidity the ECB would be forced to renege on its non-intervention commitment. In a pan-European crisis the ECB and NCB’s would ultimately be forced to step in to provide liquidity. This report also questioned the decentralisation of LOLR responsibilities noting it would lead to different levels of moral hazard in Eurozone countries. It also highlighted concerns around the lack of ECB supervision over the banking system, the inability of national level supervision to prevent contagion in a pan-European system and questioned the ability of any other source bar the ECB to provide a credible LOLR function. Similarly Buyoumi et al (1997) argued that by constraining national governments use of fiscal stabilisers the SGP would not limit the bailout risk facing the ECB, rather it would only transfer the pressure to Brussels should the need arise.

Overall various concerns were highlighted in the pre-EMU literature such as problems over fiscal discipline, the lack of fiscal transfer schemes, asymmetric inflation rates, and doubts over its ability to handle issues in the financial sector. The next chapter examines how these concerns manifested themselves as EMU developed.
Chapter Four-OCA Theory and the Eurozone

This chapter applies OCA theory to the Eurozone and examines developments since its inception in 1999 under the broad categories of symmetry, openness and flexibility. Using an OCA framework the focus will be on the economic and financial crisis within the EMU. While OCA theory cannot fully explain what went wrong it is argued design flaws highlighted pre-EMU by OCA theory caused difficulties for the Eurozone. Section 4:1 examines the Eurozone’s flexibility; variables discussed are labour mobility, wage flexibility and fiscal transfer mechanisms. 4:2 examines OCA theories openness criteria and asks whether EMU led to increased trade and if so, did it lead to correlation or specialisation. Section 4:3 is concerned with the Eurozone’s symmetries and asymmetries. Variables examined here include growth rates, inflation rates and the Kenen criteria. (Note: As extensive coverage has already been given to them, please see the appendix for a timeline of major events in the Eurozone from 1999 to 2013).

Section 4:1 Flexibility in the Eurozone

Without exchange rates and monetary policy labour market flexibility becomes an important macroeconomic adjustment mechanism (EU Commission 2008). The Eurozone is often compared unfavourably with the US which has greater intra-state labour mobility and more flexible labour markets. Also common to regions sharing the same currency are fiscal transfers form centralised budgets to regions experiencing asymmetric shocks. A prime concern voiced pre-EMU was how it lacked these adjustment mechanisms.
Figure 4:1 suggests labour mobility between countries in the then EU 15 was considerably lower than labour mobility between states in the US, EU15 within country labour mobility was also lower. Figure 4:1b shows that 42% of people were born outside US states compared with 14% born outside Eurozone countries. The OECD’s (2014) report on migration found that in line with previous literature US migration in response to labour market shocks was greater than in the Eurozone, however in response to the crisis migration has reacted strongly. For instance they find that in the EU-27 up to 37% of the unemployment increase in the 2009-11 period was offset by a population change. This corroborates with other findings suggesting that the immediate response of migration to labour demand shocks increased over time (Dao et al 2014).
Figure 4:2 from Andor (2014) suggests labour has flowed from regions of high unemployment to regions of lower unemployment, between 2011-12 labour inflows increased to the stronger economies in Germany and Austria while labour flowed out from the crisis countries of Spain and Ireland. While migration has responded to recession in the EU, the OECD finds that labour mobility adjustments within the Eurozone itself are primarily attributed to citizens from recent EU accession states and from non-EU citizens. Further a significant number of Eurozone citizens that did move were actually naturalised immigrants. A 2008 report found that it was 50% more likely a non-EU national comes to work in an EU country than it was for a national from another EU country (EU Commission). Also migration as a shock absorber is more significant for the EU-27 than it is for the Eurozone (Dao et al 2014).

Although migration helped reduce unemployment levels in the crisis countries, with the exception of Ireland immigration surpluses remain suggesting migration alleviated only part of the problem (Brauninger and Majowiski 2011). Thus intra-Eurozone labour mobility by Eurozone citizen’s remains low meaning mobility remains a weak adjustment mechanism. Cultural and language differences, family ties, lack of suitable skills etc., still act as barriers to mobility for Eurozone citizens. While migration in response to adverse shocks does not prevent unemployment in the US the Eurozone’s lower mobility makes adjustment to shocks even more painful (Dao et al 2014).
Wage and Price Flexibility

Wage and price flexibility is another important OCA adjustment mechanism. With fixed nominal exchange rates in a currency union a change in the price level is the only instrument Eurozone members have for correcting real exchange rate misalignments (Peters and Reijer 2012). Measuring on the basis of nominal wage growth versus productivity growth in the period 2000-2008 mixed results are found for Eurozone Members (Peters and Reijer 2012). In this period nominal wage growth for Greece, Ireland, Spain and Portugal was greater than their growth in productivity levels. Wage growth in Austria and Belgium was in line with productivity growth, German growth in productivity during this period outweighed its growth in nominal wages. Barbosa and Alves (2011) argue that some members lacked sufficient flexibility to maintain their competitiveness in the Eurozone’s first decade. Thus when recession hit peripheral countries had unit labour costs and prices well out of line with the core countries meaning they faced significant adjustment problems (Krugman 2012).

Zenmanek (2011) suggests rigid labour markets in the Eurozone restrict quick adjustment of the real wage. Figure 4:3 indicates the flexibility of labour markets in a selection of Eurozone countries. Compared with the US, Eurozone countries have stricter employment protection procedures in place, a comparison of Eurozone countries themselves shows some are stricter than others. However this is not definitive as although Germany ranks as having the strictest labour markets its centralised bargaining system ensures quicker adjustment than the more
protectionist legislation in France for instance. What it suggests is that on the whole Eurozone labour markets are more protected and less responsive than those in the US.

In relation to Eurozone adjustment Darvas (2012) finds that Ireland, Spain and Portugal improved their export performance in the period 2008-2011, however they only outperformed the Eurozone core countries by a small margin. There’re mixed results in terms of wage adjustments, even though their export performance improved nominal wages did not fall in Spain and increased in Portugal, wages fell in Greece but their export performance was very poor. Ireland had the most pronounced fall in labour costs which improved its price competitiveness vis-a-vie its intra and extra-euro area partners, this led to strong improvements in its export performance (ECB 2013). Darvas concludes that although internal adjustments can work they are very painful and in the Eurozone did not prevent huge jobs losses even where nominal wages fell.

Differences in labour markets, sticky prices/wages, and asymmetric adjustments mean wage flexibility has not produced the necessary internal adjustments required in the Eurozone. They’re two important reasons why wage flexibility might not help, firstly if monetary policy cannot react appropriately, deflationary pressures from lower wages lead to higher real interest rates, hurting the economy, secondly high debts and downward wages hurt consumption and thus the Economy (The Economist 2012). Even where real exchange rate adjustments have worked, Darvas (2012) findings suggests they have not adjusted enough and the adjustment achieved came at a heavy cost to those economies. It’s not that flexible wage rates are an ineffective adjustment mechanism; rather the conditions for them to work effectively do not exist in enough Eurozone countries.

Fiscal Transfers

Fiscal transfers as a means of adjustment relates to Kenen’s argument for fiscal integration where a large “federal component to spending at the regional or local level can help deal with asymmetric shocks” (Krugman 2012, p.5). For instance inter-state fiscal transfers are significant in the US offsetting 10 to 30% of fluctuations in state incomes (Eichengreen et al
2014). However as figure 4:4 shows in comparison with the US Eurozone fiscal transfers at 0.5% are almost non-existent as an adjustment mechanism.

The lack of fiscal transfers is due to the small budget available to Brussels. It was also a part of the EMU’s design that members would keep control of their own fiscal policy. Moral hazard was also a problem where it was feared countries would become dependent on transfers and avoid undergoing necessary structural reforms. However following the crisis instead of being able to use fiscal policy in a counter-cyclical manner the crisis countries had to undertake large fiscal consolidations (Gibson et al 2014). The liquidity crisis for governments then forced them to turn off the automatic stabilisers; fiscal policies became pro-cyclical pushing countries into a deflationary cycle (De Grauwe and Ji 2014). Thus as an adjustment mechanism inter-state fiscal transfers do not have a role in the Eurozone and secondly what fiscal policy leeway governments had could not be used as the crisis governments had to introduce pro-cyclical austerity measures.

Section 4:2 Openness

Mckinnon’s (1963) criterion for OCA members was that they have economies very open to trade, and economies which trade heavily with each other. This section examines how open economies in the Eurozone are, the patterns of trade in the Eurozone since its formation and whether the euro has had specialisation or endogenous effects. As figure 4:5 shows the economies in the Eurozone are very open to trade with the areas three largest economies of Germany, France and Italy having more openness to trade than the US or Japan.
As both Krugmans and the Frankel and Rose argument rest on the effects of increased trade they will be examined here by reviewing how trade has developed in the EMU. Rose’s (2000) study on the effects of currency unions upon trade concluded that the EMU had the potential for substantial trade effects, Baldwin (2006) defines this as the “Rose effect”. Initial estimates for EMU trade effects ranged from 2% in Glick and Rose (2002) to 27% in Barr et al 2003 (cited in Camarero et al 2013). In his analysis of the literature up to 2006 Baldwin finds that the euro did appear to have a Rose effect and led to a 5 to 10% increase in intra-Eurozone trade on average, in a 2008 study Baldwin et al confirm a trade effect with an aggregate impact of around 5%. Cafiso (2008) compares the Rose effect to the Border effect on trade, he finds that although the Rose effect is not as strong as some estimates he concludes that it is nonetheless “not a spurious outcome because it emerges in many papers which use different econometric techniques, datasets and time intervals, and is always clearly detected” (p.24). Camarero et al (2013) find that Austria, Belgium, Luxembourg and Italy are among members that benefited most in relation to intra-EMU trade, overall they predict that the EMU’s trade effect has been quite small.

Sadeh (2014) argues that the euro provided little benefit to trade until its notes and coins were introduced making it hard to detect the Euros effect early on. Unlike the other findings discussed here Sadeh suggests that the euro had a strong effect almost doubling the amount of trade between members, while also increasing trade with non-members by around 35%. Figure 4:6 shows Sadehs optimistic estimates of the Euros effect on intra-Eurozone trade.
The ECB (2013) suggest it would be wrong to conclude that monetary union has not had an effect in stimulating intra-Eurozone trade. They suggest that in the period 1999-2011 intra-Eurozone trade increased by 50% at constant prices. However the increase in extra-Eurozone trade in this period was even greater meaning the contribution of intra-Eurozone trade to total Eurozone trade declined slightly from 50% in 1999 to 46% in 2011.

Thus the evidence presented suggests a general consensus that EMU has had positive effects on extra-Eurozone trade, it also had positive effects on intra-Eurozone trade albeit great uncertainty over its magnitude. But overall as figure 4:7 shows intra-Eurozone exports only account for 17% of Eurozone GDP compared to 66% in the US.

In relation to the Frankel and Rose hypothesis Mongelli (2008) cites a number of studies which presented evidence of increased business cycle synchronisation however the evidence was not conclusive. Barbosa and Aves (2011) argue there is no signs of homogenisation between members despite increased trade and diversification of economies. They suggest
evidence from their model pointed towards Krugman’s specialisation paradigm although the significance of this result is small. Pissani-Ferry (2013) also shares this view arguing that the EMU’s trade creation has been weak with some evidence seeming to suggest agglomeration effects are present, again however this effect is not very strong. Thus the dynamic effects of the Eurozone have been inconclusive; Eurozone economies are on the whole very open to trade but still lag behind the US on intra-member trade.

Section 4.3 Symmetry in the Eurozone

In OCA theory symmetry as defined by De Grauwe (2006) relates to the symmetry of shocks between currency union members. This relates to Kenen’s (1969) criteria that members have diversified economies meaning the country is not overly dependent on one sector of the economy over another thereby reducing the potential for damaging asymmetric shocks. Data on the diversity of Eurozone countries does not produce any concrete conclusions although from their analysis Barbosa and Alves suggest the EMU as a whole has become increasingly diversified (2011). Figure 4:8 implies that the Eurozone’s diversification as a whole has increased since the creation of the EMU in 1999.

To limit potential asymmetric shocks the second aspect of Kenen’s criteria says member states should have economies with structural similarity. Figure 4:9 Measures the similarity of a selection of Eurozone countries trade structures against the trade structure of Germany, this suggests that trade dissimilarity is not extensive with the Netherlands and Ireland the most exposed to asymmetric shock.
Thus in relation to the Kenen criteria the ECB (2013) suggest euro countries export relatively similar goods and the Eurozone as a whole exports a well-diversified baskets of goods. However as Barbosa and Alves (2011) argue it is not possible to infer from their data an increasing homogeneity of economic structures between the members. Regardless of homogeneity or not Kenen (2003) points to a number of studies which show that “industry-specific shocks have not been the main cause of output fluctuations, nor have they varied hugely in relative importance” (p.155).

**Financial Market Integration**

Ingram 1962 stresses the importance of financial markets to an OCA as they help mitigate against asymmetric shocks by directing savings from surplus regions to affected ones (Cited in Barbosa and Alves 2011). Financial market integration also encourages economic growth and closer ties between currency union members; as a result it is an important aspect of Mundel II OCA theory. Mckinnon (2004) also notes its importance for protecting against asymmetric shocks. This works as a common currency encourages international portfolio diversification which then allows for the sharing of risk from asymmetric shocks.
Since its formation in 1999 the EMU has led to strongly integrated financial markets and substantial increases in financial market activity. Mongelli (2008) notes several positive changes in the EMU’s financial markets from 1999 with firstly money markets integrating almost immediately after the euros introduction.

Co movement between government bond markets and stock markets increased notably while government bond spreads converged strongly rarely exceeding 40 or 50 basis points until 2008. Between 1998 and 2004 FDI increased by 180% while FDI accounted for 24% of the Eurozone’s total GDP, intra-Eurozone FDI increased by 240% accounting for half of the areas total FDI. Using the ECB’s indicators of financial integration figure 4:10 shows the powerful effect the EMU had on integrating money markets with bank lending rates converging significantly from 1999 up until 2008. However while financial markets converged and capital flowed freely Honkapohja (2014) notes financial market integration is far from complete especially in the area of financial supervision and regulation.

**Interest Rates, Inflation Rates and Growth Rates**

Fleming (1971) notes the importance of inflation rates remaining low and similar for OCA members. However as discussed in chapter three pre-EMU concerns were expressed about the common monetary policy and its impact given diverging inflation rates existing between members. Alan Waters argued that “in the presence of major asymmetries across countries, a single monetary policy would result in country-specific inflation which would reduce real interest rates and have destabilising pro-cyclical effects” (cited in Pisani-Ferry 2012, p.7), this became known as the Walters Critique. Figures 4:11 and 4:12 show GDP growth rates and inflation rates in a number of Eurozone countries.
Some countries had low growth and inflation while others had high growth and inflation, on these two variables asymmetries were visible between the Eurozone economies. In the period 2000-2004 the range of cumulative inflation across Eurozone members was 16.5% compared with a range of 8.7% across US regions (Lane 2006). Evidence suggests that the differences in inflation rates exceeded what could be explained by the Balassa-Samuelson effect (Eichengreen 2012). Some Eurozone countries also benefitted from negative real interest rates with even the private sector being able to borrow at negative rates (Polito and Wickens 2014). This fuelled a credit boom in the peripheral countries acting as a strong stimulus to economic activity. ZENAMEK (2011) notes how “buoyant capital inflows from high-saving Eurozone countries into PIIGS countries financed housing booms and wage growth above productivity growth” (p.42). These countries then lost competitiveness against other members. The increase in capital flows meant capital flowed to countries riddled by domestic distortions, bubble driven asset booms, and unrealistic expectations of future growth (Eichengreen 2012).
The combination of negative real interest rates and financial market integration led to large capital inflows into the peripheral and growing economies of Ireland, Spain and Greece. This cheap credit helped sustain economic growth in these countries despite their loss of competitiveness. The common monetary policy resulted in interest rates too low for the peripheral countries which fuelled domestic demand and resulted in a substantial build-up of private indebtedness (Pisani-Ferry 2012).

Figure 4:13 shows how the Eurozone as a whole had kept control of fiscal expenditures throughout the boom period. However it also shows during the same period how the Eurozone’s household debt rose persistently, this growth was especially acute in Ireland and Spain. Private debt/GDP in 2001 was 198% in Ireland and 190% in Spain, by 2008 it was 372% for Ireland and 272% for Spain (OECD 2014). In contrast Germany’s private debt/GDP ratio remained steady throughout the period, in 2001 it was 170%, by 2008 it was 162%.

Although financial market integration ensured capital flowed freely in the Eurozone’s first decade, when the crash came Pisani-Ferry (2012) suggests the lack of a LOLR function and bank-sovereign interdependence meant capital flowed back within country borders and to safe heaven investments. This financial market fragmentation is clear in figure 4:14
Figure 4.15 shows government bond spreads remained remarkably low throughout the boom period. For Honkapohja (2014) the euro’s creation led to “virtual disappearance of interest rate differentials between members of the euro area despite…….. major heterogeneities between the countries” (p.261). In 2006 a body of opinion was emerging to express concern over the unjustifiably narrow bond spreads given the differences between Eurozone members (Lane 2006), and by 2010 large differentials in bond spreads had emerged as markets began to price in the underlying asymmetries between Eurozone countries. For De Grauwe and Ji (2014) markets did not price government bonds correctly before the crisis and then overreacted once it came pushing up government bond spreads, governments then reacted with austerity measures in an attempt to lower debt ratios and assure markets. However because austerity caused growth rates to fall public debt ratios continued to rise and are now much higher than they were in 2010 (Mazzolini and Mody 2014), figure 4.16 reflects this.
When the boom ended banking liabilities were put onto the government balance sheets (Eichengreen 2012), without any LOLR function the default risk of these governments was then seen as a real threat. It was only when in 2012 the ECB announced its OMT procedures and effectively said it would act as LOLR that the spreads began to drop again (De Grauwe and Ji 2014).

Polito and Wickens (2014) contend that the underlying cause of the crisis was a monetary policy too loose for Spain, Ireland, Greece and Portugal. Low interest rates and integrated financial markets ensured enough cheap capital was available to sustain growth in the overheating economies while also leading to excessive private debt accumulation. And as noted price stability will not necessarily ensure financial stability as the reduced risk can incentivise financial institutions to leverage up and reach for yield (Goodhart 2014). Added to this were low government bond spreads which effectively masked the asymmetries between Eurozone members.

**Section 4:4 Conclusion**

On the evidence presented here it appears the Eurozone as an optimum currency area did not have enough symmetry of growth and inflation rates between members for a single monetary policy to work, and as discussed it lacked sufficient labour market flexibility and fiscal transfer mechanisms to then adjust effectively to the crisis. As Lane pointed out in 2006 the Eurozone was not an OCA and that still appears to be the case, this is due to continuing
asymmetries between member economies and also asymmetries and a lack of flexibility in adjustment from the crisis. Eurozone asymmetries manifested themselves in two ways. Firstly as argued by Wyplosz (2013) there is strong evidence of demand shocks to the crisis countries where large current deficits, sizeable positive output gaps and real effective exchange rate appreciation is observed. This shock was not driven by trade dissimilarity or a lack of diversification but rather by excessive domestic demand stimulated by fiscal spending in some countries or private debt accumulation in others. Secondly the adjustment process has been highly asymmetric with large increases in unemployment in the crisis countries while Germany enjoyed some of its best years (Wyplosz 2013). Thus in the next chapter reforms are suggested to help overcome the Eurozone’s flaws highlighted here.
Chapter Five – Solution to the Crisis, Making the Eurozone an OCA

In chapter four evidence suggested that in strict consideration of the criteria the Eurozone cannot yet be called an OCA. However this should not be seen as an argument against the EMU project. As discussed in chapter two Mundell II OCA theory plays down the significance of losing control of independent monetary policies and national currencies because they pose as many problems as they solve. Assuming there is no better alternative it would seem imprudent to abandon the EMU project, thus the crisis is an opportunity to reconstruct the flaws that precipitated the recession. It is argued here that fiscal policy, banking policy and monetary policy reforms can move the EMU closer to the OCA ideals. Section 5:1 uses the concept of a new Eurozone policy trilemma to highlight the elements in need of reconstruction. Emerging from this section 5:2 examines how a banking union can strengthen the EMU. Section 5:3 then examines the important role of a lender of last resort (LOLR). Because banking union alone does not suffice Section 5:4 examines prospective fiscal policy reforms. Section 5:5 concludes and suggests that solving the Eurozone’s trilemma problem can push the area closer to being an OCA.

Section 5:1 The Eurozone’s Trilemma

![Diagram of the Eurozone’s Trilemma](image-url)
The left hand side of figure 5:1 shows the policy trilemma Eurozone countries face. Design flaws are reflected in strict no monetary financing, no-co responsibility for public debt and bank-sovereign-interdependence. The contradictions of these three then lead to the financial/fiscal policy trilemma as proposed by Obstfeld (2013). This graph shows that financial stability, financial integration and fiscal independence are incompatible with each other in a monetary union meaning one of the three must be given up. In a monetary union like the Eurozone with strong financial integration during the boom years, fiscal independence worked against financial stability. As chapter four discussed increased financial integration had asymmetric effects on member states with some states benefitting more than others from low interest rates and increased capital flows. When the boom ended the trilemma’s incompatibility became clear. Because governments issue debt in a currency they do not control (De Grauwe 2013) when problems emerge there is no LOLR function and in the EMU no co-responsibility for public debts. Financial market integration in the boom period became financial fragmentation when it ended with sovereigns having to provide fiscal support to the banking systems. However fiscal support is not viewed as a credible backstop in an integrated financial system. This then creates a doom loop (Obstfeld 2013) where banking problems become sovereign problems, because governments are not considered a credible backstop it then led to liquidity problems for banks and sovereigns. Hence this trilemma suggests fiscal independence is incompatible with financial integration and financial stability. A reliance on fiscal backstops may actually promote the segmentation of financial markets by country (Obstfeld 2013).

This flaw in the Eurozone’s design contributed to asymmetries between members in the boom years and then to asymmetric adjustment problems. Steps can be taken to ensure excessive asymmetries driven by financial integration are minimised. The possible solutions to this trilemma are shown in Pisani-Ferry’s diagram; these are financial union (Banking union), fiscal union and a LOLR function for sovereigns.

Section 5:2 Banking Union

As Gibson et al (2014) note the idea of a banking union is not discussed in the OCA literature; however given the nature of the current crisis it will be essential for making the
Eurozone an OCA. The benefit of a banking union to an OCA is that it can minimise the asymmetric effects financial integration had on growth rates, inflation rates and real interest rates in Eurozone countries. Secondly it can prevent banking-sovereign doom loops thus preventing asymmetric adjustment problems. Pisani-Ferry et al (2012) describe the four pillars of good banking policy as banking regulation, bank supervision, deposit insurance and bank resolution authorities. Although finance spans the Eurozone in a network of cross-border banks and obligations, supervision, resolution and safety nets are subject to national level control (IMF 2013a). Emerging from this are four necessities for a banking union 1) European Banking Regulation 2) European Wide Supervision 3) European Bank Deposit Insurance and 4) European Wide Resolution Authorities.

National regulation during the boom years meant banking systems were regulated unevenly throughout the Eurozone. However as noted in a monetary union without banking union, national regulators may unduly favour its own banking system and economy while ignoring potential cross border spill-overs (Dell’Ariccia et al 2013). This meant national authorities had different incentives in relation to the types and strictness of the regulations they applied. Banking regulation applied evenly across the Eurozone would ensure banks in all member states are subject to common minimum standards. A single regulatory framework helps contain systemic risk and curb moral hazard issues associated with common backstops and safety nets (IMF 2013a). An independent European wide supervisory mechanism then ensures regulations are enforced effectively. A single supervisory mechanism (SSM) also “facilitates a systemic approach of supervision to risk management across all countries and helps identify and prevent build-ups of excessive risk concentrations” (IMF 2013a, p.8).

A European bank deposit insurance scheme funded by the banks helps protect deposit holders in the event of crisis. Together with a LOLR function they would provide a common safety net enhancing the ability of the Eurozone to cope with shocks that might overwhelm the ability of individual economies to cope (IMF 2013a). In the event of banking system problems a European wide single resolution mechanism (SRM) can help decide the viability or otherwise of struggling banks. The presence of a credible resolution framework is essential to ensure an effective supervisory mechanism (Dell’Ariccia et al 2013). The resolution mechanism also allows for early intervention to address weak banks and prevent contagion.
across the system (IMF 2013a). Deposit insurance and a SRM are both necessary compliments to the SSM and help break the bank-sovereign doom loop (Obstfeld 2013).

In addition to these reforms the Liikanen (2012) report recommends that trading activates beyond a certain threshold be carried out on a stand-alone basis separate from the retail deposit bank. The report emphasised the need for designated bail-in instruments, re-evaluation of minimum capital standards, and reassessment of how real estate lending is treated. Similarly the OECD (2014) argues for the phasing out of zero-risk weighting of government bonds on banks’ balance sheets, they also highlight the need for banks to diversify their sovereign debt holdings. Separating banking activities helps limit contagion effects while bail-in instruments can limit costs to taxpayers and reduce the moral hazard problems stemming from implicit bail-out guarantees.

Reforms initiated so far by the EU include the strengthening of banks' solvency, strengthening of bank resolvability, better guaranteeing of deposits and improving market infrastructures (EU Commission 2014). This however is not enough for creating a full banking union. While the EU’s agreement on a single supervisor has teeth and could prevent future issues, The Financial Times (2014) is critical of the resolution mechanism for winding up banks for being too cumbersome while still allowing national interests too much say, further the resolution fund at €55bn is far too small. Banking union is no panacea to Eurozone problems and may not have prevented the current crisis, however it would have helped in the aftermath of the crisis by breaking the adverse bank-sovereign growth spirals (IMF 2013a). Banking union is one step the Eurozone can take to solve the new trilemma meaning financial integration does not fragment every time there is a loss of confidence in the system. A key risk is of incomplete or stalled implementation, therefore agreement and implementation of the banking union’s key design features must not be delayed far into the future (Dell’Ariccia 2013).

Section 5:3 ECB as Lender of Last Resort for Sovereigns

A prime reason for the Eurozone’s new trilemma is that in a monetary union without monetary financing and co-responsibility for public debts, sovereigns have to act as the banking sectors LOLR.
As figure 5:2 from 2008 shows because the debts held by banking systems in the Eurozone are much greater than the GDP of some members this can lead to credibility problems and liquidity problems. “In hindsight, it is evident that, in good times, banks grew in many places to a scale that overwhelmed national supervisory capacities, while in bad times, they overwhelmed national fiscal resources” (Dell’Arccia et al 2013). Hence the arguments appear strong for the ECB to act as LOLR to banks and/or sovereigns in order to break the doom loop. The EU has established the ESM whose core function the IMF argues should be to recapitalise systematically important domestic banks thereby removing residual risk from the sovereigns already strained balance sheet (2013a). Hence the ESM could be viewed as another means of breaking the bank-sovereign link. However the ESM has been criticized on the grounds that without unlimited funding it lacks credibility as a force against contagion, further it also comes attached with austerity conditions which could push members into recession (De Grauwe 2013).

As discussed in chapter four the power of a LOLR function (even though it was only a guarantee and never activated) was evident in 2012 when the ECB announced its outright monetary transaction procedures which was swiftly followed by a fall in government bond spreads. De Grauwe (2013) notes the moral hazard problem of this function but argues that the ECB made the right decision to become LOLR to banks and sovereigns. In contrast Wyplosz (2013) argues against the ECB as LOLR to sovereigns because he is in favour of reinforcing the no bailout clause; however he does agree the ECB should become a
permanent LOLR to the banking system. Either way if Pisani-Ferry’s solution to the trilemma problem is to be followed through the LOLR role for sovereigns or private sectors, or both, must be clearly stated and not implied, ambiguity over this role will not limit the moral hazard problem.

Section 5:4 Reforms of Fiscal Policy

Banking Union alone cannot solve the trilemma, while banking union might limit the probability and the extent of bank failures it cannot prevent contagion spreading from poor fiscal policy into the banking system and as the crisis has shown into the wider Eurozone economy. Wyplosz (2013) suggests the crisis was largely the result of fiscal indiscipline, fiscal excess in Greece and Portugal, fiscal indiscipline broadly defined to include poor banking oversight in Spain and Ireland as well as too many favourable policies to their construction industries. If as De Grauwe argues the ECB’s LOLR function was to be made permanent fiscal policy reforms are needed to prevent moral hazard problems. Thus a credible banking union requires some form of fiscal backstop and centralised fiscal oversight (Obstfeld 2013).

To limit the potential for and extent of future crisis the IMF (2013b) outline three measures for deepening fiscal integration in the Eurozone (1) better oversight of national fiscal policies and enforcement of fiscal rules to address common concerns (2) greater fiscal risk sharing and (3) common borrowing to finance greater risk sharing and stronger back-stops. The European Commission has undertaken a number of measure 1 reforms including the six pack, fiscal compact and two pack reforms. The six pack looks to strengthen both the preventative and corrective arm (EDP) of the SGP. The fiscal compact means members must respect/ensure convergence towards their country specific medium-term objective with budget rules being implemented in national law (Commission 2014). The two pack strengthens Eurozone surveillance mechanisms and introduces regulations for the monitoring and assessing of members draft budgetary plans. The six pack/two pack ensures federal level monitoring of fiscal policies while the fiscal compact incentivises fiscal self-discipline at the national level. However like in 2003 the credibility of the SGP has already been undermined with the recent transgressions of France and Italy , as reprimanding them was too risky, face
saving measures were adopted meaning France and Italy broke the Eurozone’s fiscal rules (Mody 2014).

Outside of the European Stability Mechanism (ESM) less progress has been made in relation to measure two fiscal risk sharing reforms. Wyplosz (2013) argues that “robust insurance mechanisms can be designed for the Eurozone to mimic the US insurance system against cyclical idiosyncratic shocks, those asymmetric shocks at the heart of the OCA literature” (p.39). The federal government in the US plays an important stabilising role with states remaining fully accountable for their debts (Tirole 2012). For Wyplosz a fiscal risk sharing mechanism like this should be administered at the federal level and in contrast to what has been discussed so far he suggests it can only work with decentralised fiscal policy and a strict no bailout clause.

Vetter (2013) reviewed a number of options available for fiscal equalisation and transfers between Eurozone members including (a) a common unemployment insurance scheme (b) a fiscal insurance mechanism against output fluctuations and (c) a common budget for the Eurozone. Option (a) acts as an automatic stabiliser enabling counter-cyclical fiscal policy in the event of growth slumps and increased unemployment. Option (b) activates when a country experiences a strong negative shock, this would activate when the deviation from potential GDP passes a certain threshold. While (a) and (b) require some pooling of resources at the federal level option (c) goes the furthest by creating a common budget. This would be a very deep form of financial integration essentially creating a fiscal union. While no doubt subject to moral hazard problems a fiscal risk sharing mechanism could also act as an alternative adjustment mechanism.

Pisani-Ferry (2012) argues that debt should be issued in the form of Eurobonds, perhaps the most radical way of addressing measure three, common borrowing reforms. Eurobonds would create a safer asset class and favourable borrowing conditions acting to prevent substantial increases in borrowing costs for members hit by an asymmetric shock. The Tommaso Padoa-Schioppa Group (2012) suggest the creation of a European debt agency (EDA), under their proposal governments would issue a proportion (approx. 10%) of their
debt through the EDA, this would be a liquid and safe asset from which governments could
draw if faced by high interest rates on their own debt. Other schemes include the blue
bonds/red bonds proposal, the Euro-bills proposal and the idea of European safe bonds
proposed by the Euro-nomics group (Tirole 2012). Common borrowing reforms however face
significant obstacles including the need for treaty change, conflict over uneven benefits and
its attendant fiscal union means a further significant dilution of Eurozone member’s
economic sovereignty (Pisani-Ferry 2012)

While reforms related to fiscal discipline have already been introduced they will at best only
act to limit the probability and maybe the extent of future fiscal problems. The SGP did not
prevent the current crisis nor can it solve it. Measure one reforms have also been criticised on
the grounds that they will lock in austerity, in the current crisis unending austerity has
increased the debt repayment burden not reduced it (Mody 2014). Thus measure one reforms
only seem feasible in the long run with some form of fiscal risk sharing or transfer schemes
which have been shown to play an important role in the US. Given the need for the pooling
of resources and an acceptance of greater risk sharing it is perhaps not surprising that less
progress has been made on measures 2 and 3 discussed here, while also banking union
remains incomplete.

Section 5:5 Solving the Trilemma and OCA Theory

In chapter four it was argued that some Eurozone members experienced asymmetric shocks
when the boom period ended and then experienced asymmetries when adjusting to this crisis.
The standard OCA theory adjustment mechanisms of labour mobility and wage/price
flexibility did not suffice while there was no means of fiscal adjustment. However evidence
in chapter four suggests these shocks were not the result of trade dissimilarity or a lack of
trade diversity as proposed by standard OCA theory. Rather the problems brought to reality
the Walters critique. That is asymmetries between members were exacerbated by highly
integrated money markets combined with low government bond spreads not reflective of
differences between members, a common monetary policy then led to low real interest rates
mainly for the peripheral economies. Pisani-Ferry and Obstfelds impossible trinities were
reflected in how fiscal independence meant countries like Spain and Ireland failed to detect
banking system problems while unduly favouring their construction sectors, Greece and Portugal failed to maintain sufficient fiscal discipline. In a monetary union with strongly integrated financial markets lacking co-responsibility for debt or a LOLR function this fiscal independence worked against financial stability, hence the banking system-sovereign doom loop that followed.

As noted a common monetary policy can be made more sustainable over time through deeper levels of economic integration (Lane 2006). Thus figure 5:3 suggests that deeper integration through banking union, fiscal union and a LOLR function are the means by which the Eurozone could move to the right of the OCA line. This could happen firstly because banking union can have positive effects on symmetry if only by preventing excess asymmetries by limiting artificial stimulus to overheating economies and by breaking the doom loop thereby limiting asymmetric adjustment problems (LOLR function would also contribute to this). Secondly fiscal union would have positive effects on flexibility by providing transfer mechanisms to smooth the effects of asymmetric shocks. Thirdly both banking union and fiscal union strengthen financial integration which in turn has benefits in terms of increasing symmetry and flexibility through international portfolio diversification.
Figure 5:4 shows the interaction of all three OCA variables. As chapter four suggests the Eurozone’s is already sufficiently open and integrated to satisfy the integration criterion. As argued here banking union, fiscal union and a LOLR can prevent excess asymmetries and ensure greater flexibility in the area. As figure 5:4 shows a sufficient combination of flexibility and integration can compensate for a lack of symmetry. For example assume net benefits (B=Flexibility+Integration+Symmetry) of EMU are 0 in 1999, by 2010 the lack of symmetry was -1 on the diagram, integration was positive at 0.5 but the EMU lacked any flexibility (0) thus the costs (C) of EMU outweighed the benefits. Now assume banking union and a LOLR prevents further excess asymmetries while fiscal union increases flexibility to 3, combined with the positive integration B will then be > C (adapted from De Grauwe and Mongelli 2005).

Hence this argument suggests EMU is already integrated but this should be reinforced by increased flexibility and mechanisms to prevent excess asymmetries. Further these reforms may foster even greater integration leading to greater trade. Suppose then that the Frankel and Rose hypotheses dominates Krugmans hypotheses then increased trade would lead to increased income correlation and thus increased symmetry. As fig 5:4 shows the more integration and symmetry in an OCA the less need there is for flexibility thus less requirement for fiscal transfers and as a consequence the less need there is to activate the LOLR function.
However Mody (2013) argues there is another option of muddling through (Opt 2 in fig 5:3) with the Eurozone moving half way between integration and decentralisation, such an option does not prevent excess asymmetries nor increase flexibility thus poses as many problems as it solves. Unfortunately this appears to be the option taken so far by Eurozone leaders reflected in half measures towards fiscal union and an obsession with the SGP which has already been undermined, banking union is also not complete while the LOLR role remains unclear. This muddling is summed up perfectly by O’Rourke and Taylor when they note that “since the current Eurozone crisis began, the authorities involved have been unable to decide on whether there should be bailouts or not, defaults or not, automatic stabilizers or not, or bank backstops and oversight or not. Indeed, at various times they have veered towards almost all of these positions” (2013, p. 184).
Chapter Six – Conclusion

Section 6:1 Limitations and Usefulness of OCA Theory

OCA theory has been the subject of much criticism. Mundell I was found to be flawed and based on the false premise of constant Philips curves while also attributing too much power to nominal exchange rate devaluations as adjustment mechanisms. Mundell II also has its weaknesses. For one it has a strong focus on the positive impact of financial market integration as a hedge against asymmetric shocks, but as the Eurozone crisis shows without the right structures in place this integration turned to fragmentation as soon as the crisis hit thus negating any positive effects it may have had. Also stemming from Mundell II is the endogeneity of OCA’s hypotheses. Again evidence from the Eurozone suggests this effect is not yet proven, the EMU did have sufficient integration to facilitate intra-Eurozone trade, but the trade increases are inconclusive and cannot be said to have induced greater income correlation between Eurozone members’. However this effect may take at least 15 to 20 years to manifest itself (De Grauwe and Mongelli 2005). Further as discussed in chapter three the theory is also criticised for being inadequate and confused while also leading to misleading conclusions on what constitutes an OCA.

Given these flaws in the theory it is therefore wrong to conclude that it points definitively to what caused the Eurozone crisis nor does it point definitively to a way out of it. However by laying out the criterion the theory points to the main elements needed to form and sustain an OCA, thus at the very least the theory remains useful as a framework within which analyses of currency unions can be administered. As Eichengreen (2012) points out the theory had long pointed to reasons why the Eurozone was likely to work less smoothly than the US monetary union. It does this by pointing to the main characteristics essential to any regions operating with a single currency. OCA theory also points to and weighs the potential advantages against those potential costs of a single currency (Krugman 2012). As noted “there may not have been such a systematic scrutiny of so many economic features” of monetary unions without the theory (Mongelli 2008, p.8).
Section 6.2 Main Findings

In the introduction three research aims were put forward, the first of these sought to discover the concerns highlighted pre-EMU. Secondly it asked whether failure to fulfil a number of OCA criterion contributed to the current economic woes. Thirdly having identified the flaws in the Eurozone’s design this project then sought ways in which these flaws could be rectified thereby helping to create a more sustainable union.

Chapter three reviewed the literature pre-EMU. Given the common monetary policy concerns were expressed over the effects of asymmetries in inflation and growth rates between potential members. Because EMU would lead to increased financial integration the narrow role of the ECB including an unclear LOLR function made it hard to ensure financial stability. To make the no bail-out rule credible and ensure fiscal discipline the SGP was adopted. However pre-EMU the SGP was described as unworkable and likely never to be enforced. Concerns also highlighted the effects of any potential crisis, academics suggested the ECB’s narrow role would be abandoned, pressure for debt monetization would emerge as well as conflict over who should pay. Finally critics of the EMU project also pointed to a lack of lack labour market flexibility and suitable transfer mechanisms.

Chapter four then applied OCA theory to the Eurozone. Evidence presented here suggests that the Eurozone is not an OCA and the fact that is not may have contributed to its current economic and financial issues. As Hall (2013) notes there is an institutional asymmetry built into the EMU’s since its inception. A combination of a single interest rate and integrated financial markets exacerbated asymmetries between Eurozone members. Because Germany and France were experiencing low growth, interest rates were kept low. However other Eurozone economies were experiencing higher growth and inflation. Despite this capital flowed to these countries allowing them to continue stimulating economic activity despite growing competiveness losses with the rest of the union. As bond spreads remained low, fiscal discipline had failed and capital flowed there was no way to dampen the overheating economies. When the crisis hit the peripherals then experienced asymmetric shocks relative to core Eurozone countries. The narrow role of the ECB, a lack of credible LOLR functions,
bank-sovereign interdependence then all contributed to asymmetric adjustment problems. Financial integration also turned to fragmentation as capital flowed back within country borders once the crisis hit. Adjustment was not helped by a lack of labour market flexibility nor any means of fiscal transfers to smooth the effects of shocks. While the Eurozone’s openness to trade appears to have had positive effects on increasing intra and extra Eurozone trade these effects are unclear, meaning the endogeneity of currency areas hypotheses is not as of yet proven correct.

As the Eurozone’s flaws mean it is not an OCA reforms are needed to rectify this. Chapter five discussed one option is to go with deeper integration by means of a banking union, fiscal union and LOLR for sovereigns. Such reforms are no doubt controversial and subject to criticism, for instance Mody (2013) doubts these reforms not because they could not work but because they are unlikely to be actually implemented. However these reforms would have benefits in terms of moving the Eurozone to the right of the OCA line. Fiscal union means the introduction of fiscal transfer mechanisms long an important element of an OCA and OCA theory, such mechanisms would increase flexibility and help smooth the effects pf asymmetric shocks. Banking union is essential to an OCA because it prevents asymmetries being exacerbated by the greater capital flows from integrated financial markets. Further banking union and a LOLR can break the sovereign-banking doom loop that has produced the Eurozone’s current asymmetric adjustment problems. As De Grauwe (2006) notes it’s difficult to see how currency union can survive if every time a country finds itself in trouble due to an asymmetric shock its told it is on its own and should expect no help. Unfortunately it appears Eurozone leaders instead have taken the option of muddling through thus far (Mody 2013). However if the Eurozone is to survive and prosper it should function like an OCA, thus it must go with deeper integration or find another alternative as muddling through could unravel the whole EMU project.
Appendix

Timeline of Events in the Eurozone: 1999-2013

This timeline is a brief synopsis of the main events in the Eurozone in the period 1999 to 2013. Material for this timeline has been taken from the following sources: the BBC, ECB, Mongelli 2008, Bruegel, the Guardian and Yahoo Finance.

1999
- Start of the Monetary Union, launch of the Euro, and the start of the financial services action plan (FSAP)
- Euro introduced and adopted by 11 countries: Belgium, Germany, Ireland, Spain, Italy, Luxembourg, the Netherlands, Austria, Portugal and Finland
- Exchange rates of the participating nations are irrevocably fixed and the Euro starts to trade on financial markets

2001
- Greece joins the Euro

2002
- On the 1st January, notes and coins are introduced
- Agreement is reached on EU REPO rates
- Financial markets, especially money markets, have converged strongly

2003
- Germany and France fail to meet the requirements of the stability and growth pact, however the excessive deficit procedures are not used against them

2005
- Completion on the legislative phase of the FSAP
- ECB warns on financial imbalances
- Ecofin council gives notice to Greece to take action to reduce its excessive deficit
- European council looks to reform the stability and growth pact

2006
- ECB suggests investors may be underestimating risk in the Euro Area
- IMF report on severe shortcomings in the area of fiscal transparency in Greece
2007
- Slovenia joins the Euro area
- Financial markets potentially unstable says ECB president
- Liquidity shortages worldwide and inter-bank lending slows down

2008
- Cyprus and Malta join the Euro area
- Lehman Brothers collapses, financial crisis spreads
- Within days the crisis spreads to Europe with governments from the UK to Germany stepping in to bail-out banks
- ECB conducts a special term refinancing operation in order to improve the liquidity position of the Euro Area banking system
- In December EU leaders agree on a 200bn-euro stimulus plan to help boost growth following the financial crisis

2009
- Slovakia joins the Euro Area
- In April France, Spain, Ireland and Greece are ordered to reduce their budget deficits
- Concerns start to grow about some EU members following the Dubai sovereign debt crisis
- Greece’s public debt reaches 113% of GDP, nearly double the Eurozone limit of 60%
- Severe accounting irregularities discovered in Greece, budget deficit is revised upwards to 12.7% from 3.7% for 2009, this was nearly four times the maximum allowed by EU rules.
- ECB launch one-year maturity refinancing operations

2010
- After another review of their accounts, Greece’s deficit is again adjusted upwards from 12.7% to 13.6% of GDP
- In May the extent of Spain’s Economic problems comes to light and the government announces austerity measures
- Eurozone members and the IMF agree a 100bn euro bailout package for Greece
- Also in May the European financial stability facility (EFSF) was created to provide loans to cash-strapped countries, also established at the same time and with a similar purpose was the European Financial Stabilisation Mechanism (EFSM)
- In November Portugal pass an austerity budget to cut public spending and raise taxes
- Also in November the EU and the IMF agree a bailout package for Ireland totalling 85bn euros. Ireland then introduces one of the toughest austerity budgets in its history
- The EU runs stress tests on 91, 7 of which fail. However the tests are criticised for not including the possibility of a sovereign default.
2011

- Estonia joins the Euro Area
- A permanent bailout fund called the European Stability Mechanism (ESM), worth 500bn euro, is established
- In May the Eurozone and the IMF agree a 78bn euro bailout package for Portugal
- A second bailout for Greece is agreed, this worth 109bn euro and is designed to resolve the Greek crisis and prevent contagion among other European economies. In October leaders from the Euro Area agree to write down Greek debt by 50%
- Yields on government bonds in Spain and Italy rise sharply while Germanys fall to record lows
- As result on August 7th the ECB announces it will buy Spanish and Italian bonds to try and bring down their borrowing costs
- Italy passes a 50bn euro austerity budget, Italy’s debt rating is cut by Standards & Poors from A+ to A
- Relief in the markets as authorities decide to help the banking system with an extensive bailout provided to Franco-Belgian bank Dexia
- EU announces it will press ahead with an intergovernmental treaty to enshrine new budgetary rules
- To fight inflation, ECB increases interest rates on April 7th and again in July, however by November ECB was cutting interests amid fears of another recession
- In order to keep banks in cash, the ECB embarks on two longer-term refinancing operations (LTRO)

2012

- Standards and Poors downgrade France and eight other Eurozone countries, they also downgrade the EU bailout fund, the EFSF
- At the end of January the fiscal pact is agreed between all EU members except the UK and the Czech Republic
- EU announces that the Eurozone economy will contract by 0.3% in 2012
- European Commission predicts that the Eurozone economy will contract by 0.3% in 2012
- The OECD calls for the Eurozone rescue fund to be increased to 1tn euros
- Italy’s borrowing costs start to creep up again as does Spain’s with their borrowing costs rising to the highest rate since the launch of the euro in 1999
- As a result in September the ECB announces an unlimited but sterilised bond buying program. The new program known as outright monetary transactions replaces the securities markets program
- Following this announcement bond spreads begin to decline
- ECB also cuts interest rates further
- German courts give the ok for their participation in the permanent bailout fund, the ESM (replacing the EFSF)
2013

- In January Commission president Jose Manuel Barroso declares that the euro crisis is over, the IMF chief suggests the Eurozone is showing signs of recovery
- European stock markets boom but GDP growth remains elusive
- Unemployment growth reaches 12.2% in April
- Cyprus is told to accept a bank levy (bail-in) or leave the euro
- In March the Euro group reaches agreement on a future macroeconomic program for Cyprus, in July Cypriot authorities conclude the resolution of the country’s major bank
- Eurozone record second quarter growth of 0.3%
- ECB lowers interest rates again, announces that they are likely to remain low for an extended period of time
- In September MEP’s give the go ahead for a single supervisory mechanism for the banking system, 150 of the EU’s largest banks will come under the direct supervision of the ECB
- ECB then begins assessments of Euro Area banks ahead of assuming its supervisory role
- ECB also strengthens its risk control framework

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