

**Charles University in Prague**

Faculty of Social Sciences  
Institute of Economic Studies



MASTER THESIS

**Parallel Currency: A Suitable Tool for  
Vulnerable Euro Zone Countries?**

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Academic Year: **2012/2013**

## Declaration of Authorship

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Prague, May 17, 2013

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Signature

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I am very grateful to my supervisor, prof. Ing. Oldřich Dědek CSc., for his help, valuable suggestions and encouragement that helped me to complete this thesis.

## Abstract

The recent financial and economic crisis led to a deepening of fiscal problems in many countries all over the world. European countries were also hit hard by the economic downturn. The critical situation in Greece and its negative impact on the economic situation in the whole Euro zone has brought up many questions about the rigidity and functionality of the euro concept. A majority of economists and politicians support the idea of saving the Euro zone since the break up would be quite costly. There are many ideas regarding a solution to the current situation, and one of the most radical is the introduction of a parallel currency in the states which are trapped in the debt crisis. The aim of the thesis is to take a critical look at the historical development of different approaches to this theme with a focus on theories based on the devaluation as the solution. The parallel currency theory is compared to Euro zone break-up scenario and hard restructuring option and the positives and negatives of each approach are analysed. Finally the simulation on the Greek case is performed to prove or disprove the positive effects of parallel currency establishment.

**JEL Classification**

E31, E42, E52, E63, F15, F36

**Keywords**

Parallel currency, financial crisis, the euro,  
the European Union, the Euro zone

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## Abstrakt

Globální ekonomická krize vedla k prohloubení fiskálních problémů států na celém světě. Také evropské státy byly silně zasaženy hospodářským útlumem. Kritická situace v Řecku a hlavně její vliv na ostatní státy Eurozóny vyvolal řadu otázek ohledně rigidity a funkčnosti konceptu eura jako jednotné měny. Většina ekonomů a politiků se přiklání k zachování Eurozóny, jelikož očekávají, že její rozpad by byl mnohem nákladnější. Existuje mnoho názorů na řešení současné kritické situace a jedním z radikálních způsobů řešení je koncept zavedení paralelní měny ve státech EMU, které se potýkají s dluhovými problémy. Cílem této práce je zhodnocení historických a současných přístupů k paralelním měnám se zaměřením na teorie, které své řešení staví na devalvaci paralelní měny. Koncept paralelní měny je porovnán se scénářem, který zahrnuje rozpad Eurozóny, a restrukturalizací veřejných financí. Pozitiva a negativa jednotlivých přístupů pak tvoří základ pro finální analýzu. Na příkladu Řecka je modelován dopad zavedení paralelní měny a její devalvace.

<b>Klasifikace</b>	E31, E42, E52, E63, F15,F36
<b>Klíčová slova</b>	Paralelní měna, finanční krize, euro, Evropská unie, Eurozóna
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# Acronyms

EA	Euro area
ECB	European Central Bank
EMU	Economic and Monetary Union
EP	European Parliament
EU	European Union
GDP	Gross domestic product
NGO	Non-governmental organisation

# Master Thesis Proposal

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<b>Defense Planned:</b>	June 2013

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**Proposed Topic:**

Parallel Currency: A Suitable Tool for Vulnerable Euro Zone Countries?

**Topic Characteristics:**

Recently, the term “parallel currency” has been discussed among journalists and economists. It was only a few months ago when the economists of Deutsche Bank brought a new approach to how to deal with the Greek debt crisis: issuing a parallel currency, the Geuro. But the concept of usage of two or more currencies is not a new idea.

There have been many examples of how to use a parallel currency throughout history and even in modern times. The Swiss WIR has been in function since 1929. The usage of non-domestic currency was, is and possibly will be common during critical periods, often when hyperinflation occurs, e.g. Argentina backed the pesos with dollars in the 1990s. The approach is connected with the beginning of the Euro, or presently as a tool to save the Euro.

The aim of this thesis is to take a critical look at the historical development of different attitudes to this theme, with a focus on theories based on devaluation as the solution of the problems, as well as to state the possible positives that the authorities of the Euro zone should adopt or negatives that they should take a lesson from. Finally, as an example, the idea of a second currency for Euro zone countries with fiscal problems and its possible impacts, not only on them, but also on the entire Euro region and the European Union will be analysed.

**Hypotheses:**

1. It is possible to establish a functional dual currency system in the countries of the Euro zone.
2. Devaluation of national currency units (parallel currency) will reduce negative effects of the restructuring process without the necessity of leaving the Euro zone.
3. Greece would be able to successfully implement the second currency through which they can solve their fiscal problems.

**Methodology:**

This thesis will be based on the critical analysis of current approaches to parallel currency theory. Historic examples will be discussed and used as a basic background for analysis of current approaches. Based on this information, the hypothesis will be confirmed or disproved. If possible, I would like to include an empirical portion to evaluate possible impacts of devaluation on future development for countries in financial difficulties. Finally I would like to state my own approach to the current situation.

**Outline:**

1. Introduction
2. Literature overview
3. Parallel currency in the history
4. Critical analysis of approaches to current critical situation in the Euro zone
5. Conclusion

**Core Bibliography:**

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 Author

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 Supervisor

# 1 Introduction

The recent financial and economic crisis led to a deepening of fiscal problems in many countries all over the world. European countries were also hit hard by the economic downturn. The critical situation in Greece and its negative impact on the economic situation in the whole Euro zone has brought up many questions about the rigidity and functionality of the euro concept. A majority of economists and politicians support the idea of saving the Euro zone since the break up would be quite costly. There are many ideas regarding a solution to the current situation, and one of the most radical (and from my point of view also the most curious approach) is the introduction of a parallel currency in the states which are trapped in the debt crisis.

The main aim of this thesis is to give an explanation of the parallel currency approach in its basic form. There are many different theories about the parallel currency that will be analyzed, and there will be discussed the positives and negatives of each approach. Generally, the devaluation of a national currency is very commonly used by weaker countries to restore balance and competitiveness. In a currency union, such as the European Economic and Monetary Union (EMU), countries cannot devalue the currency and thus the thesis will be focused on parallel currencies that use devaluation as the tool. In my opinion, there are three general possibilities that states in economic problems can choose from: internal devaluation, leaving the Euro zone (and to devalue their currency) or hard restructuring of the economy. On the following pages will be analyzed whether a parallel currency can work in reality and whether it can make the restructuring process easier and less costly through devaluation of a parallel currency, or whether it is just a utopian idea which will only lead to postponement of the necessary restructuring of an economy that will be much more costly afterwards.

The thesis is organized as follows: Chapter 2 describes the European sovereign debt crisis through the overview of the development of key characteristics of member states, together with a brief summary of the economic and political situations in weak countries. Chapter 3 summarizes the historical development of the idea of a parallel currency, as well as current approaches formulated to solve the Euro zone crisis. Chapter 4 will take a look at the treaties and whether it is possible

(legally, easily and efficiently) to establish a parallel currency. Chapter 5 defines the parallel currency and analyzes the effects of implementation and subsequent devaluation on one hand, and the “hard” restructuring of the economy on the other hand. The possibility of the break-up of the Euro zone will be examined in this chapter as well. In chapter 6, the case of a parallel currency for Greece will be examined. Chapter 7 concludes and states my own approach.

## 2 The Crisis and the European Union

The European sovereign debt crisis arose at the end of 2009 from the global financial crisis (started 2007). Since that time some European countries (the best example is being Greece) have been trapped in the debt crisis and the right solution have not emerged yet. Some economist (ten Dam or Buiter and Rahbari) see the basis in the structure and the concept of the Euro zone. Presently the Euro area (“EA”) consist population of about 330 million citizens in 17 countries (out of 27 European Union member states)<sup>1</sup> in which the euro is the only legal tender (a kind of money a creditor cannot refuse in discharge of a debt due to him in the money issued by government) as well as the only currency unit. With the adoption of the euro the member states of the Euro area have also adopted the single monetary policy which is managed by the European Central Bank (“the ECB”) and the major aim is to maintain the price stability. On the other hand *“economic policy remains largely the responsibility of the member states, but national governments must coordinate their respective economic policies in order to attain the common objectives of stability, growth and employment.”*<sup>2</sup> In following paragraphs the overview of economic situation of the EA countries (namely the government debt and balance, trade balance and the unemployment) together with opinion of citizens on the situation within the European Union will be summarized to prepare a background for further analysis.

### 2.1 Government debts and budget deficits rather than surpluses

Concerning the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union the member states should be *“conscious of the need to ensure that their general governmental deficit does not exceed 3% of their gross domestic product at market prices and that their general government debt does not*

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<sup>1</sup> What is the euro area?. European Commission: Economic and Financial Affairs [cit. 2013-03-02]

<sup>2</sup> What is the euro area?. European Commission: Economic and Financial Affairs [cit. 2013-03-02]

*exceed, or is sufficiently declining towards, 60% of their gross domestic product at market prices,*"<sup>3</sup> which are the same levels as defined in the Maastricht criteria. As can be seen in the figures below states have had problems to reach these levels recently, and not only the weak, uncompetitive ones. For the comparison following states were chosen. Germany and France are considered by most of economists as representatives of strong and competitive core EA countries, secondly they are the largest economies of the Euro zone. Contrary among weak and indebted countries are mostly rated southern countries (Greece, Italy, Portugal and Spain) or Ireland.

To allow the comparison the general government gross debt is taken as a percentage of gross domestic product ("GDP"). The referred value which should be maintained is set to be 60%. As can be seen from the figure below (Figure 2.1.1), most of the states reached much higher values in the past and all the states overcame this level during the crisis (since 2007). The most important fact is that Greece and Italy never met the Maastricht Treaty criteria concerning the level of this ratio and both the states were not even sufficiently declining to this level (both fluctuating around 100%). On the other hand both Spain and Ireland were negatively affected by the burst of the bubble in construction sector. Secondly also the strong countries are being presently much above this theoretical value settled as the optimum.

Similarly to debt also the balance is taken as percentage ration to be measureable among the countries. The optimal (or rather satisfactory) level of budget deficit was decided to be 3% of GDP. The development of the ratio is depicted in the Figure 2.1.2. Not even this goal was met by most of the countries. I would like to point out one important fact that fiscally responsible government after the sharp decline connected with recent crisis have adopted measures to deal with the adverse situation and the ratio did not reach such low levels (in our case only Germany can be taken as an example).

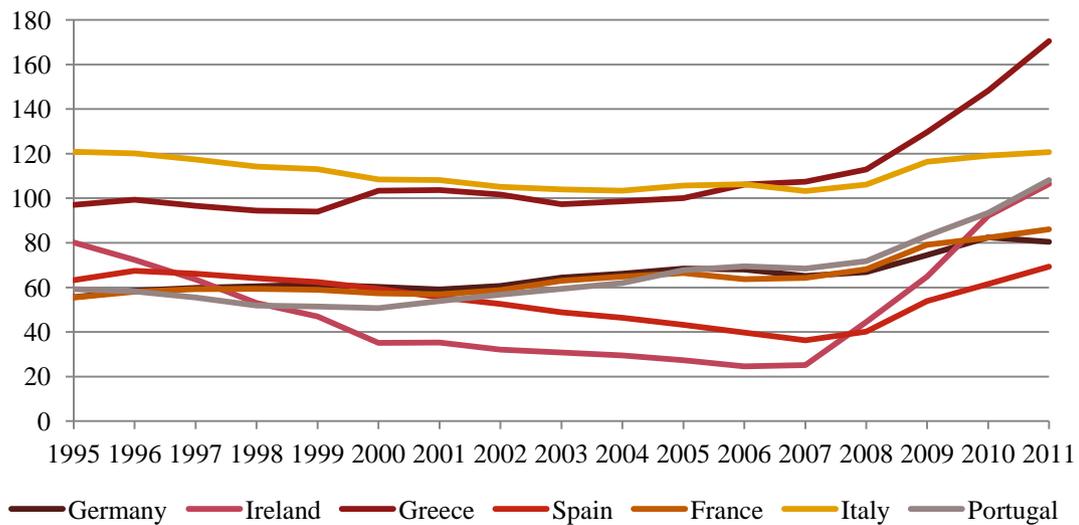
When concerning the crisis Spain and Ireland are often highlighted, but on the other hand when focusing only on the numbers both states have not been in such critical situation in comparison with Greece or Italy. Contrary as was already

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<sup>3</sup> Treaty on Stability, Coordination and Governance in the Economic and Monetary Union, p.3 [cit. 2013-03-02]

mentioned in both countries the boom in construction industry was present since the beginning of 20th century. Also the Philip R. Lane<sup>4</sup> in his paper also mentioned that the fiscal position of Ireland and Spain looked relatively healthy” till 2007. On the other hand it was caused be the sharp increase of GDP rather than the decrease of debt and budget deficit.

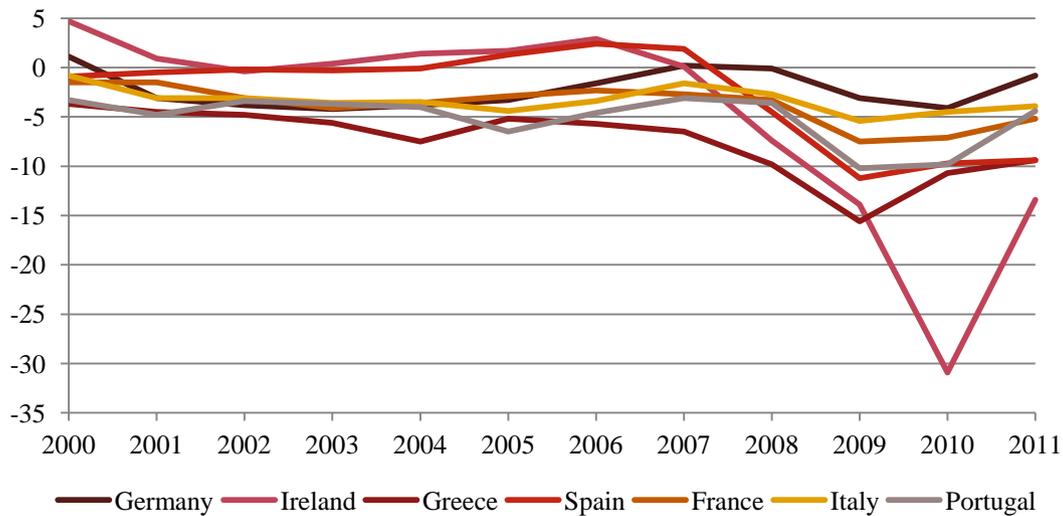
**Figure 2.1.1 Development of general government gross debt, % of GDP, 1995-2011**



Source: Eurostat

<sup>4</sup> The European Sovereign Debt Crisis, Philip R. Lane, Journal of Economic Perspectives, Volume 26, Number 3, 2012, p. 49-68

**Figure 2.1.2 Development of general government surplus/deficit, % of GDP, 2000-2011**



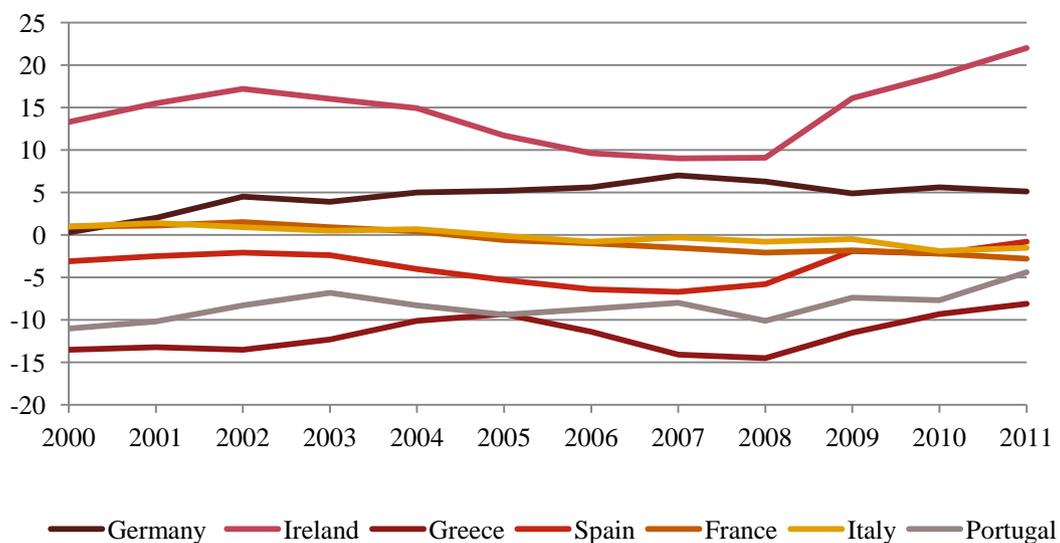
Source: Eurostat

## 2.2 The trade balance is negative for most of the EU countries

Presently the European Union (“the EU”) (and also the EA) is globally considered as one of the biggest open markets and the international trade plays significant role for all the governments, industries, companies and also people. Ziesemer (2005) in his paper stated that “*when countries have difficulties to repay debt, the natural way to increase the potential for repayment is to increase the trade surplus of goods and non-factor payments.*” The trade balance is defined as a difference between total exports and total imports (both in current prices) of the corresponding country. To obtain comparable data the indicator is used as a percentage of GDP of the country. From the theory a trade deficit in the short run can enhance the position of the country but long term deficits are thought to be unsustainable and cannot persist indefinitely. In following paragraphs we take a brief look on trade balance of representatives of Euro zone.

The Figure 2.2.1 shows the development of the trade balance between 2000 and 2011 for target countries. Firstly it can be seen that most of the countries (except Germany and Ireland) have struggled with negative trade balance recently. It means that most of the countries are net importers rather than net exporters. The negative trade balance is closely connected with the competitiveness of the country. Since the product of domestic country is not competitive for example due to high prices or low quality the total exports decreases. The weak countries often have problems with the competitiveness and therefore the negative balance is not surprising. On the other hand Greece, Spain and Portugal have improved their position since 2007. Balance of trade is one of the components of the current account which could be used to service the existing commitments when is in the surplus.

**Figure 2.2.1 Development of trade balance in current prices, % of GDP, 2000-2011**



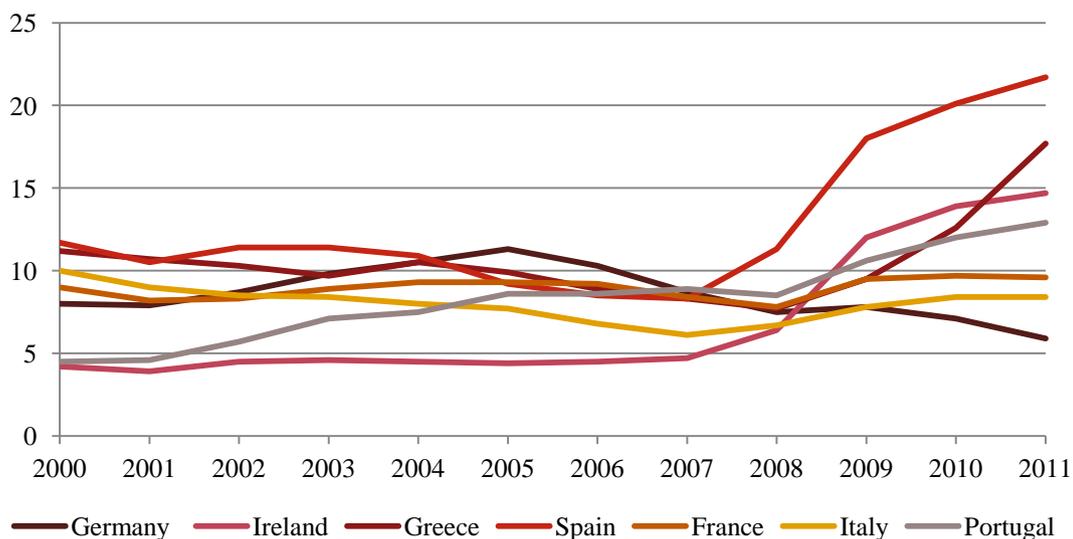
Source: Eurostat

## 2.3 Increasing unemployment, especially among young people

The global economic crisis showed up not only the financial problems of the member states but also the structural issues of the weak countries. The unemployment rate shows us the percentage of unemployed people as a percentage of the labour force (employed and unemployed people). Unemployed people are between 15 and 74, do not have work but they are actively looking for a job and they are able to start working when a chance occurs. Similarly to other measures the unemployment rate between member states differs. Moreover the unemployment rate differs between age groups.

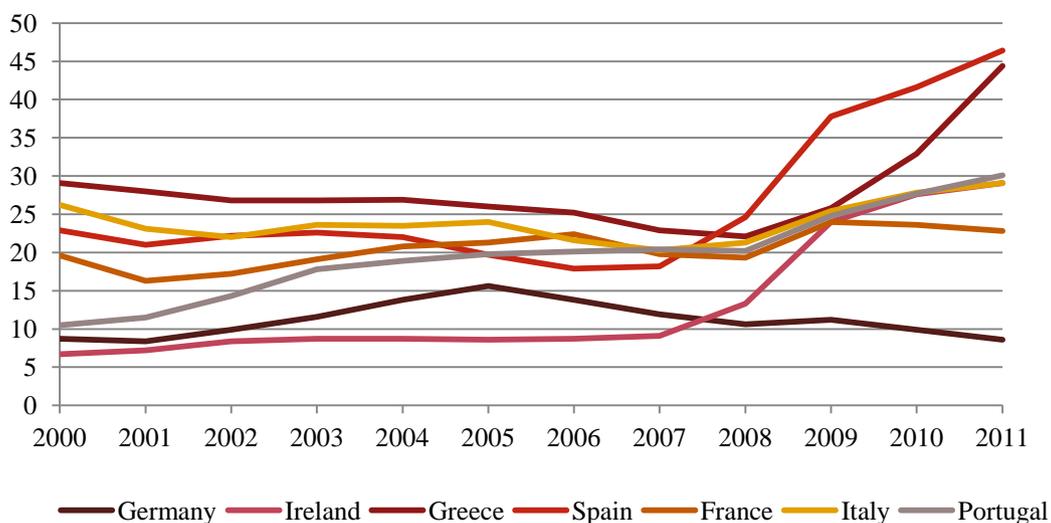
In the Figure 2.3.1 below the development of the unemployment rate for target countries is depicted. It can be seen that most of the weak member states presently suffers from the high unemployment rate which much worsen due to global crisis. Most affected were young Greek and Spanish people when nearly half was unemployed in 2011 (for more details see the Figure 2.3.2 below). And the trend and more current data demonstrate the worsening situation in weak countries.

**Figure 2.3.1 Development of the unemployment rate, total, %, 2000-2011**



Source: Eurostat

**Figure 2.3.2 Development of the unemployment rate, below 25 years, %, 2000-2011**



Source: Eurostat

## 2.4 Economical and political situation in weak member states

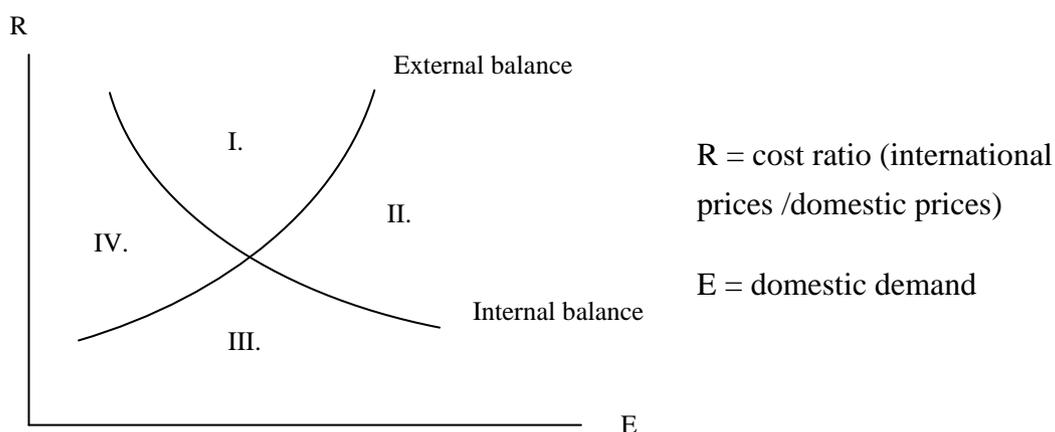
For the analysis and easy illustration of differences between countries the Swan diagram<sup>5</sup> would be used. The Swan diagram depicts the combinations between the external (current account) and internal balance (unemployment and inflation). In this analysis is assumed that the internal balance also includes the price stability. The Swan diagram is depicted below in the Figure 2.4.1. It can be seen that the lines of the external and internal balance create four sectors. In the sector I. there is surplus of the current account, the unemployment is lower than the natural rate of unemployment and there is inflation present in the state. In the sector II the economy's current account is in the deficit, the unemployment is lower than natural rate of unemployment and the inflation is present. In the sector III there is unemployment present and the current account is in the deficit and in the sector IV the current account is in the surplus but the economy suffers from the unemployment.

<sup>5</sup> Waterman (1966)

Theoretically ideal position is when both the balances are reached. But in reality at least one balance is not reached.

The weak countries suffer from the high unemployment and the current deficits (deficits of the trade balance) and therefore they should be places in the third sector and most probably in the left part. Since the effect of devaluation is that the cost ratio increases, it could be a way to reach the external balance. To reach the internal balance the increase in the domestic demand is necessary. Germany on the other hand should be placed in the upper part of the section IV or in the left part of section I. The uncertain position is caused by the fact that value of natural rate of unemployment is not known because it is only a theory.

**Figure 2.4.1 Swan diagram**



The political and social situation in the weak countries is almost critical. The increasing unemployment rate, political instability and structural reforms decreased the mood of the citizens to critical level and strikes and demonstrations are quite often in the Greece, Spain or Portugal. According to survey of the European Commission<sup>6</sup> 99% of Greek citizens and 98% of Spanish citizens think that the situation in their country is bad. People think that the most important issues that their country is currently facing is the unemployment (Greece – 58%, Spain 78%, Portugal – 57%), the economic situation (Greece – 55%, Spain 55%, Portugal 43%),

<sup>6</sup> Public Opinion in the European Union (2012)

government debt (Greece – 21%, Spain 10%) and the inflation (Portugal – 25%). And people are sceptical about the future development; around three quarters of respondents from Greece, Spain and Portugal think that the situation will be worse and the impact of the crisis on the job market has not already reached the peak. Overall trust in the European Union decreased to 33% and in the national government trust only about 28% of total citizens.

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## 3 Parallel Currency – Historical and Present Approaches

### 3.1 Introduction to historical development

From the definition money is everything which is generally accepted as a payment for goods and services or repayment of a debt.<sup>7</sup> Money has generally three functions: medium of exchange, unit of account and store of value. In history when one of the functions of money was violated countries tended to usage of other methods of payment. One of the approaches was, is and probably will be the usage of parallel currency. But it must be mentioned that during the history the term parallel currency was presented in many ways. In the simplest definition it is a usage of more than one currency in the country simultaneously which fulfil violated function of present currency. In this section different historical approaches are summarized and also new theories concerning current situation in the Euro zone are presented.

### 3.2 Parallel currency in the history

Historically first banknotes could be freely converted to gold at a fixed rate and this regime is nowadays widely known as gold standard which can (concerning the definition) be also classified as parallel currency. But it was not a pure parallelism. After the abandonment of the gold standard the governments introduced fiat currencies. Since it is easy to devalue these currencies weaker states often used monetary expansion to deal with their economic problems which led to inflationary problems. Afterwards when people realized the situation they preferred (stable) currency to the national one which resulted to so-called “dollarization” of national currencies. It means that the US dollar substitutes one or more function of the

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<sup>7</sup> Cahlik (2006) p. 89.

primary currency. The whole concept of parallel currency markets in developing countries was covered by Pierre-Richard Agénor (1992).

One of the most well known system of parallel currency which work and have a long tradition is the Swiss WIR system which is in function since 1934 and works on the basis of specialised account designed mostly for the middle class in WIR bank with WIR credits which are used as a payment for goods and services in partners businesses. It must be mentioned that even if they have some kind of credits the system bases on barter change of goods and services and the value of one WIR equals to one Swiss franc. Thus there is additional amount of “money” in the economy and since there is not any interest paid on WIR accounts people are motivated to spend these credits more quickly which bring enhances the business<sup>8</sup>.

Also during the economic crisis in Argentina the national currency was backed up with many local complementary currencies<sup>9</sup>. In Argentina the local/community/parallel currencies were generally connected with non-governmental organisations (NGO’s) and mainly used by members of these groups of people. One of the most important was the Red Global de Trueque (Global Barter Network) initiated by a group of ecologists in Buenos Aires. Also there were other system of payments complementary to official national currency but this should be only as example not a topic of this thesis.

In 2003 Gabriele Camera, Ben Craig and Christopher J. Waller published a study about currency competition. The main idea of this work was built on different currency risk and the conclusion was that *“a poorly functioning economy with risky home currency is prone to dollarization.”*<sup>10</sup> Since the authors studied two fiat currencies which compete with each other it is highly connected to the concept mentioned by Oldřich Dědek (2008) about idea of introduction and acceptance of euro through competition with domestic currencies. The euro should be adopted only in such countries where it wins the competition and so it is effective to abandon the domestic currency.

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<sup>8</sup> Vytvořte si vlastní měnu. *Euro* [online]. 2009.

<sup>9</sup> Pearson (2003)

<sup>10</sup> Camera, Gabriele, Craig, Ben, Waller, Christopher J. (2003)

As could be seen from these few examples (there are many others complementary/parallel currencies all around the world) there were mainly two types of systems: dollarization and parallel currency for relatively small group of people. But both these approaches have something in common. Local currencies did not exercise one or more of three main functions of money and so people needed some other system to make barter trade easier. Secondly the parallel currencies were introduced lost these functions during economic crisis. Such statements lead us to current critical situation in the Euro zone.

### 3.3 Current approaches to solve the critical situation of (almost) insolvent EMU members

The majority of European economists is trapped between two solutions: the fiscal union and the exit (of either the uncompetitive or competitive) countries. Both scenarios are not ideal and will be shortly discussed below. Besides these two mainstreams there are also many alternative, radical and sometimes unrealistic approaches. Even though most of them do not deal with the devaluation issues which is essential for this piece of work from my point of view it is important to also shortly summarized the main ideas. They differ in the way they are designed, implemented and importantly and mainly in the method of solution of indebtedness of members of the Economic and Monetary Union of the European Union (EMU).

#### 3.3.1 High-tech parallel monetary system for the underdogs

This approach by Trond Andersen was published in Real-world economic review (issue no. 59) in 2012 when the economists were looking for less traditional solutions to crisis in Greece and worsening situation in other European countries. The main idea is the introduction of a non-government “monetary” system. The basics is into the system where *“an alliance of large grass roots organizations (typically unions) sets up a cooperative bank like operation (“BLO”)”*<sup>11</sup> which then issues so called “value points or VPs”. The member gets a VP account with particular amount

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<sup>11</sup> Andersen (2012) p. 106

of credit and through modern technologies such mobile phones uses this account to pay for goods and services in the transactions with associated providers. The system is based on the loans of VPs which served in this system as a medium of exchange and since it is an interest-free account it is not meant as a store of value (restriction on function of “money”).

Generally it is a version of Local Exchange Trading System (LETS) which is meant to work on countrywide basis and it is designed as absolutely virtual system built on the faith which is connected to paper money (in the case of Greece) through the system of membership fees to the BLO office paid in the hard currency, the euro. Primarily the system should make the transactions easier. Since the VPs could not be used to finance the import (it is only regional system) and the consumption increases the system enhances the local productivity, the net export and thus the inflow of the euro so the country would then be able to service its debt abroad.

From my point of view the system has two main deficiencies: the faith in VPs and the fact that it is a loan-based system. In the critical situation for which is the system designed people often do not believe in printed money and probably the faith in virtual “money” without any basis will be low. This is closely connected to the second point which leads to fact that the fiscal problems such as indebtedness of the country will be solved by increase of loans among the citizens. It partially looks like the vicious circle.

### 3.3.2 Express Money: Avoiding the Euro Zone Breakup

Another concept developed by Christian Gelleri and Thomas Mayer (2012) focuses on the velocity of money. The express money is defined as government-issued regional currency which has two unique attributes: spending incentive (a user free) and leakage inhibitor (an exchange fee for conversion into euro). In comparison to the previous approach the authors are more realistic in the field of faith. They stated that *“the trust has already been badly shaken kept in place only by the willingness of more creditworthy countries to guarantee continued debt repayment.”* The authors see the solution of the current situation in Fast-Circulating, slow-leaking

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regional Money. General idea of the paper is *that “when no additional money can be funnelled into the economy, because it immediately disappears again as payment for imports or via monetary flight toward higher returns, the solution lies in using the available money more efficiently,”* so called liquidity optimization.

During the crisis the flow of goods and services sharply decreases, the unemployment increases and both facts directly and also indirectly lead to slowdown of circulation of money. Express money enhances the spending incentive through the system of fees for not spending the money in the short term. The velocity is boosted and together with the assumption that the money stays in the economy the GNP (and probably also the GDP) increases. Secondly the regional currency from the definition could not be spent to finance the import and the leakage inhibitor (the payment for conversion of the local currency to euro) stimulates the consumption of domestic production and settles the balance of foreign trade account.

As far as I am concerned this concept will not only lead to decrease of the imports to the country but it will also negatively affect the export. Thus as a consequence I see the outflow of the place of business of the firms to the other and more favourable parts of the EMU and moreover to the developing countries. Secondly the inflow of the foreign investments will be largely affected due to imposed leakage inhibitor. Last but not least from my point of view the system where EMs systematically inflow to the economy (all of them are backed up by corresponding amount of euro in the central bank) together with the fact that EM has same value as euro is unsustainable in the long term.

### 3.3.3 The Matheo Solution: A “common sense” Approach to the Euro-crisis

In the article by Andre ten Dam (2011) the approach called Matheo solution is described. I would like to give more space to this method of solving the crisis because the concept makes a great background to my approach to parallel currency. Firstly the author mentioned the fact that the philosophy of “one-size-fits-all” turned into “one-size-fits-nobody”. Secondly he mentioned that the crisis was caused by the

lack of competitiveness of the weaker Euro-countries, which is closely connected to structural defects in the countries. The concept is based on *“Euro Currency Unit-Exchange Rate Mechanism (ECU-ERM), which is a unique flexible monetary system ‘tailor made’ for the Euro zone in its specific economic circumstances and the Europe of different economic speed.”*<sup>12</sup> Firstly it distinguishes between two attributes: the euro as the only legal tender and as a currency unit (ECU).

The parallel currency in this concept (called national currency units – NCU) serves only for the calculation purposes and the euro stays in the position of the only legal tender. Since the NCUs fluctuate besides euro, they can also be devaluated against the ECU which is thought to be a way to restore the competitiveness of the country. The Matheo solution proceeds from the monetary situation in the Europe before the EMU, that means the period between 1999 and 2002 only with swapped roles of the euro and NCU. Next step to abandon the concept of one-size-fits-all is the introduction of different interest rates for different countries. It is designed to help the countries to adjust the policy to current economic situation. Important point is that the European Central Bank will hold the decision power (it will control the monetary policy of the ECU-ERM) and thus will determine whether NCUs devaluates or not and will set the interest rate policy. The concept is opened to adoption of tougher regulation of the system.

The Matheo Solution is quite interesting and from my point of view also quite realistic approach. On the other hand the description is described superficially. Thus this work will take some ideas into account and deepen and widen the idea of parallel currency which primarily solves the indebtedness through increase of the competitiveness and devaluation of NCU.

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<sup>12</sup> ten Dam (2011) p. 3

### 3.3.4 The Future of the Euro Area: Fiscal Union, Break up or Blundering Towards a ‘You Break It You Own It Europe’

This study was performed by Willem Buiters and Ebrahim Rahbari from the Citi Investment Research & Analysis division of the Citi group in the late 2011. In the first place I would like to mention that this paper summarizes most of current realistic scenarios that can be adopted by the government and the ECB. Mainly there are four approaches critically evaluated under the fiscal union for the European Union for the Euro zone: fiscal federalism, transfer Europe with loss of fiscal sovereignty for beneficial member states, the Euro-bands solution and the so called ‘Santa ECB’. They also analysed both breakup scenarios – breakup initiated by the indebted uncompetitive countries and on the other side the one initiated by core Euro area countries which are solvent and internationally competitive will walk out.

They also shortly mention the idea of introduction of complementary or parallel currency to euro and thus no necessity to leave the Euro zone. It covers the basic idea that *“if the aim was to devalue the currency while remaining a member of the EA there are ways to introduce a national currency as a numeraire, unit of account or invoicing currency for new contracts while maintaining the euro as the sole legal tender.”*<sup>13</sup>

The concept brings the model for the relationship between parallel currency and the euro:

$$S_t = \left( \frac{1 + i_{t,t+1}^{EUR}}{1 + i_{t,t+1}} \right) E_t S_{t+1} + \left( \frac{1 + i_{t,t+1}^{EUR}}{1 + i_{t,t+1}} \right) \pi_{t,t+1}$$

where  $S_t$  is the spot exchange rate (number of parallel currency per euro),  $i^{EUR}$  is the one-period interest rate on euro-denominated risk-free bonds,  $i$  is the one-period interest rate on parallel-currency-denominated risk-free bonds,  $E_t S_{t+1}$  is the expectation this period of next period of next period’s spot exchange rate and  $\pi_{t,t+1}$  reflects the exchange rate risk premium. From the equation we can see that parallel currency’s *“external value will be weaker the higher the expected cumulative differential between euro and the parallel currency interest rates, the weaker the*

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<sup>13</sup> Buiters and Rahbari (2011) p. 34

*expected long-run value of the currency  $E_t S_\infty$  and the higher the cumulative expected risk premium.*<sup>14</sup> It is one of the few approaches which try to set a model for the exchange rate between currencies.

Moreover the researchers have developed their own approach which they named ‘You Break It You Own It Europe’ (YBIYOIE). According to them it is “*a European Union in which insolvency of sovereign is settled between the taxpayers of that sovereign and its creditors without any ex-ante permanent financial support (grants, transfers or subsidies) from any other nation’s taxpayers.*”<sup>15</sup> The YBIYOIE is comprised of four steps: “*a sovereign debt restructuring mechanism for the EA; a Special Resolution Regimes and a Eurotarp for cross-border sibanks and other sifis*<sup>16</sup>; *taking the ECB out of the quasi-fiscal support game; and adequate liquidity support for sovereigns deemed solvent.*”<sup>17</sup> The approach also brings three institutional changes of current arrangement. First of all the ECB will provide financing to EFSF/ESM, secondly the financial resources of the EIB will be used as a stop gap source of funding supplementary to EFSF financing. Last but not least the veto power of small members over sensible proposals will be limited by the Enhanced Cooperation.

The researcher from the Citi Bank developed highly sophisticated theory which does not involves the idea of parallel currency (which they do not expect to happen). They see the problems in current functionality of the system and from their point of view only the YBIYOIE can solve the current crisis. I mentioned the YBIYOIE due to fact that restructuring of the debt and change of the system can be one of the solution which stays opposite to parallel currency. Their attitude to parallel currencies I find also quite useful and the concept will be used in further study.

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<sup>14</sup> Buiter and Rahbari (2011) p. 35

<sup>15</sup> Buiter and Rahbari (2011) p. 41

<sup>16</sup> Systematically important banks and systemically important institutions.

<sup>17</sup> Buiter and Rahbari (2011) p. 42

### 3.3.5 Bitcoin – New Worldwide Phenomenon

Last but not least concept I would like to present is the new phenomenon which is presently globally available online parallel currency, the Bitcoin. According to bitcoin.org it is a “*digital currency, a protocol, and a software that enables instant peer to peer transactions, worldwide payments with low or zero processing fees.*”<sup>18</sup> Bitcoin does not rely upon any centralised authority, but it uses the cryptography to control its creation and transactions. Thus the currency cannot be influenced by anyone, counterfeit, the cash flows cannot be controlled or no one can give rise to the inflation. The total amount of bitcoins is fixed and unchangeable at 21 million bitcoins. On the other hand it is possible to divide each bitcoin to 100 million units called satoshi which makes this currency deflationary. The emission of the money is managed through mathematical laws and cannot be influenced. Bitcoin is independent currency with no fixed rate to any worldwide currency. The currency is not backed by any commodity, such as gold, and stands only on the trust of people.

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<sup>18</sup> An open source P2P digital currency. *Bitcoin* [online]. 2009, 2013 [cit. 2013-05-10]. Dostupné z: <http://bitcoin.org/en/>

## 4 Parallel Currency – Is it possible to establish?

### 4.1 Current legal framework connected to implementation of the parallel currency

Traditionally the European Union law is divided into three sources: primary law, secondary law and supplementary law. For the implementation of the euro moreover the modification of national legal code is necessary. But for the analysis of parallel currency implementation the most important document is the Council Regulation (EC) No 974/98 of May 1998 on the introduction of the euro. According the Article 288 of Treaty on the functioning of the European Union (consolidated version, 2012) the regulation “*shall have general application*” and “*shall be binding in its entirety and directly applicable in all member states.*” Thus the Council Regulation No 974/98 is binding for all the EU countries and has direct effects on the implementation of the parallel currency.

There are several parts in the Council Regulation No 974/98 which have direct effect on implementation of the parallel currency. The most important is the Article 10 which states that “*banknotes denominated on euro shall be the only banknotes which have the status of legal tender in participating Member States.*” Similarly Article 11 states that the coins denominated in euro or cents are the only coins with this status. According to the Article 15 paragraph 1 “*banknotes and coins denominated in a national currency unit... shall remain legal tender within their territorial limits until six months from the respective cash changeover date at the latest.*”

From the previous paragraph it can be seen that the implementation of parallel currency is against effective legislative. But there are three possibilities if there would be political will to introduce parallel currency as a solution of the sovereign debt crisis of the Euro zone. First solution is to change the legislation to allow members to

implement parallel currency; second is the reintroduction of transitional provisions and dual circulation; last but not least and probably the easiest is the “grey zone” approach – suitable definition of the “parallel currency”.

## 4.2 Effectiveness of implementation of new legislation

First approach how to introduce a parallel currency requires the implementation of new legislation. The legislative procedure has been formatted since the establishment of European Coal and Steel Community and was amended by the Lisbon Treaty in 2009 for the last time. Most of the European laws are presently adopted by the ordinary legislative procedure. Hence, the comprehension of the process is important for introduction of parallel currency in the Euro zone and the length of the process is relevant when concerning the effectiveness of implementation of the parallel currency.

### 4.2.1 Ordinary legislative procedure

The proposal, usually prepared by the European Commission<sup>19</sup>, is sent to both European Parliament and the Council and it is made available to national parliaments which are allowed to come up with reasoned opinion connected to satisfaction of subsidiary principle within eight weeks. The first reading in the European Parliament take place afterwards and there is no time limit specified for the first reading. The position of the Parliament is adopted in a voting by the simple majority and there can be made some changes to the original draft of the proposal. In the next step the Council has to adopt its position, a common position (a qualified majority) is needed to approve the proposal. If the law is not adopted the law is returned to Parliament with explanation of the reasons of not-adoption for the second reading.

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<sup>19</sup> According to Lisbon Treaty in can also be done by the  $\frac{1}{4}$  of the member states, or requested by the European Central Bank or Court of Justice.

Contrary to the first reading the time for the second reading is limited to three months with one month extension. During this period of time the Parliament examines the position of the Council and there are three possible positions which it can adopt. If the Parliament approves the Council position or does not decide within the given time, the act is adopted within the meaning of the Council. On the other hand the position of the Council can be rejected by the Parliament by absolute majority. Finally the Parliament can by absolute majority amend the text of the legislative and then submit this position to the Council which has again three months (with one month extension) to approve the modified version and therefore accept the legal act, or not to approve all of the amendments. If all the changes are not approved the Conciliation procedure follows.

The acts which were not adopted during first or second reading have to go through the Conciliation procedure, which is limited to six weeks, extensible by two weeks. Each member state has one representative in the conciliation committee and together with 27 representatives of the European parliament (chosen according to strength of the political groups). The committee should find the compromise between the Parliament and the Council within the given time and the joint text is the result of these negotiations. The joint text is after the approval of the conciliation committee presented to the Parliament and the Council. Both institutions have six weeks (extensible to eight weeks) to approve the joint text – third reading; the Parliament by majority of the votes cast; the Council by the qualified majority.

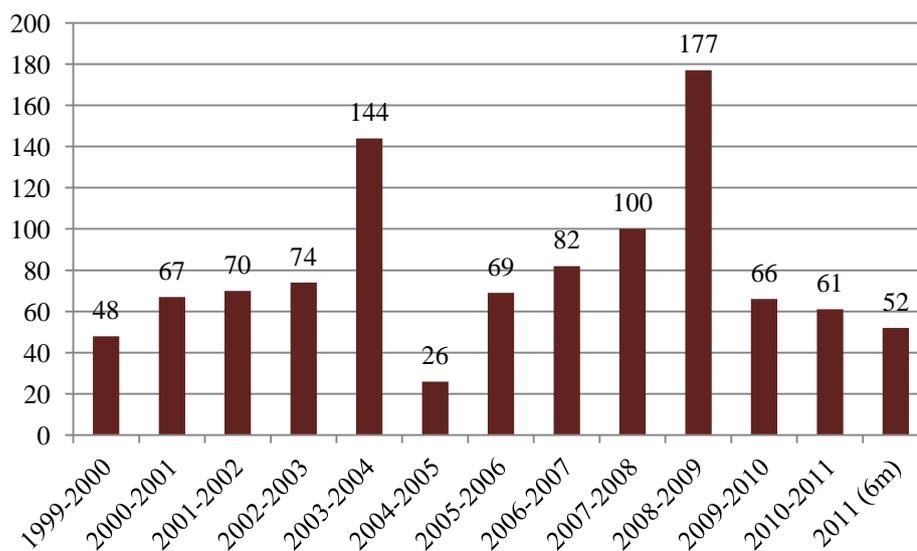
#### 4.2.2 Efficiency of the process

This part contains the evolution of ordinary legislative procedure, the co-decision procedure respectively, over the period between 1999 and 2011. The statistics on one hand are publically available; on the other hand most of them are published after the term of office of the given legislature. Thus final data are available for 6<sup>th</sup> legislature of European Parliament (2004-2009) and 5<sup>th</sup> legislature (1999-2004). There was a midterm evaluation for the 7<sup>th</sup> legislature (2009-2014) published in July 2012; hence more present data would be used only when

available<sup>20</sup>. It must be mentioned that the comparison is not accurate since there were significant changes in competencies of individual institutions due to implementation of the Lisbon Treaty.

To start with the analysis it is important to summarize basic information about the codecision procedure. In the figure Number of codecision files 1999-2011, we can see the number of codecided acts which were adopted each year. The year does not represent the calendar year but with respect to term of office it is considered as a time between 1 May of the first year and 30 April of the second year for the 1999-2008 period; between 14 July of the one year and 13 July of the second year for the 2009-2011 period; and lastly the year 2011 runs only till 31 December. As far as I am concerned the finding that during both 5<sup>th</sup> and 6<sup>th</sup> legislature there was an increasing tendency of adoption of new acts during the term of office should have been anticipated. On the other hand the unexpected conclusion was that the number almost doubled in the last year of the tenure in comparison to the year before.

**Figure 4.2.2.1 Number of codecision files, 1999-2011**

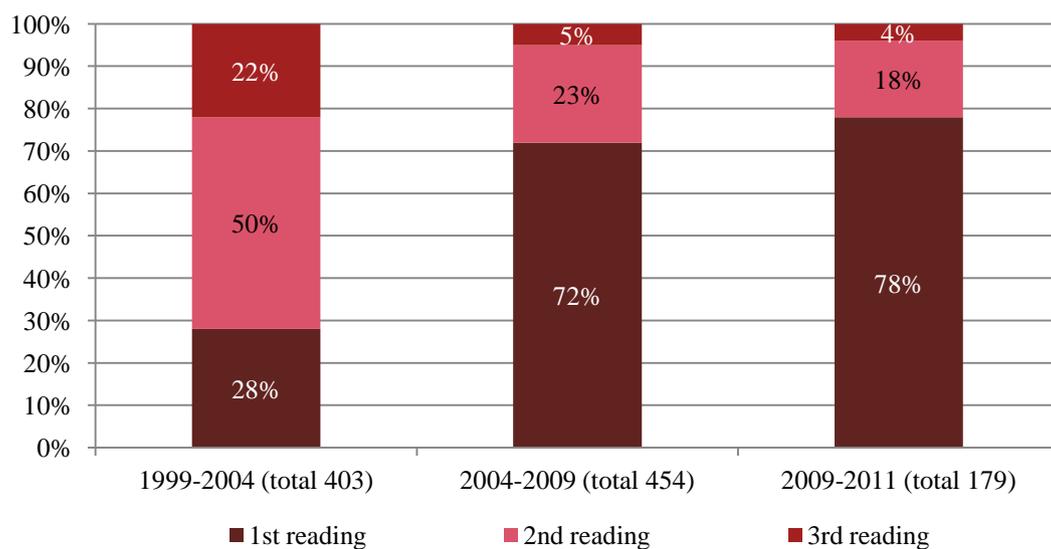


Source:EP, Activity Report, 7th parliamentary term

<sup>20</sup> Conciliations and Codecision. European Parliament [online]. 2013 [cit. 2013-04-15]. Dostupné z: [http://www.europarl.europa.eu/code/about/statistics\\_en.htm](http://www.europarl.europa.eu/code/about/statistics_en.htm)

The working relationship between the Commission, the European Parliament and the Council has significantly improved in during last 3 legislatures, which led to closer cooperation; hence the majority of legal acts were agreed during the 1<sup>st</sup> reading between 2004 and 2011. As depicted in the Figure 4.2.2.2 the percentage of codecision procedures which were adopted during 1<sup>st</sup> reading almost tripled comparing the 7<sup>th</sup> and 5<sup>th</sup> legislature. Such an increase of 1<sup>st</sup> reading agreements brought up also the criticism since one of the reason why the percentage increased is the political urgency, which can have negative effect on the final form of the act. Secondly the existence of “early-second reading agreements” must be mentioned. It is the procedure when the Council’s Position is approved by the Parliament without any amendments, often includes the negotiations between EP and the Council. The “early-second reading agreements” made 7% of total agreements and classical 2<sup>nd</sup> reading made only 11% during the first half of the 7<sup>th</sup> legislature. The percentage of the 1<sup>st</sup> reading agreements also differs among the committees. For our case the ECON committee which deals with the economic and monetary affairs is important. ECON concluded all 24 cases at the 1<sup>st</sup> reading during the 7<sup>th</sup> legislature.

**Figure 4.2.2.2 Percentage of codecision files adopted at 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> reading, 1999-2011**



Source: EP, Activity Report, 7th parliamentary term

Finally the duration of the codecision procedure will be analysed as a useful indicator of the effectiveness of the procedure. The time span between the submissions of the proposals by the Commission and the adoption date of the final acts slightly lowered in the 7<sup>th</sup> legislature. On the other hand it still takes a year and three months to adopt the legislative and this amount of time does not include the preparation of the proposal by the Commission. Moreover the period after the adoption when the legislative need to be signed and published in the Official Journal is not included.

**Table 4.2.2.1 Average length of codecision procedure, 6<sup>th</sup> and 7<sup>th</sup> legislature, months**

	1st reading	Early 2nd reading	2nd reading	3rd reading
<b>2004-2009</b>	17	27	34	45
<b>2009-2011</b>	15	23	33	29

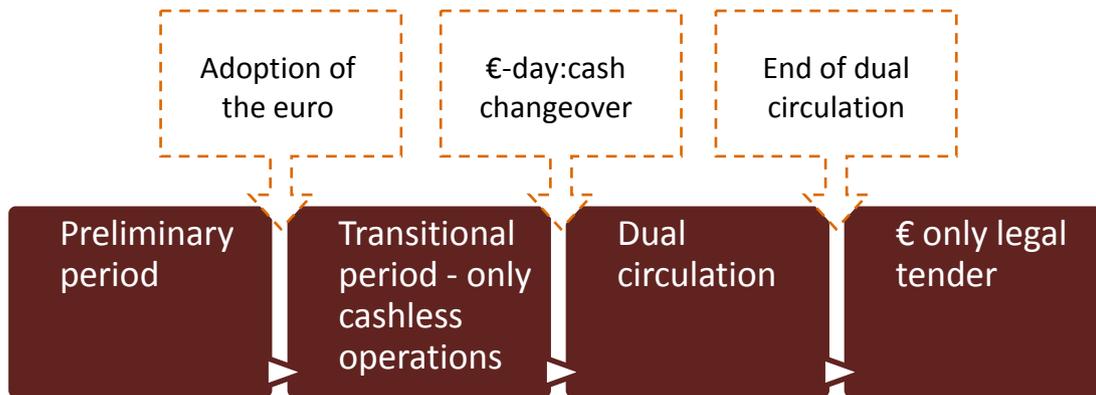
Source:[http://www.europarl.europa.eu/code/about/statistics\\_en.htm](http://www.europarl.europa.eu/code/about/statistics_en.htm)

Overall the effectiveness of the codecision procedure which is used to adopt most of the legislative acts is increasing. Based on the information stated above it can be expected that ECON will tend to conclude the codecision procedure about the new law concerning the establishment of the parallel currency at the first reading, which would take probably more than one year. Presently when more and more countries are suffering from the debt crisis and fast solution is needed it is highly probable that the implementation of the parallel currency will not be done through implementation of the new legal act.

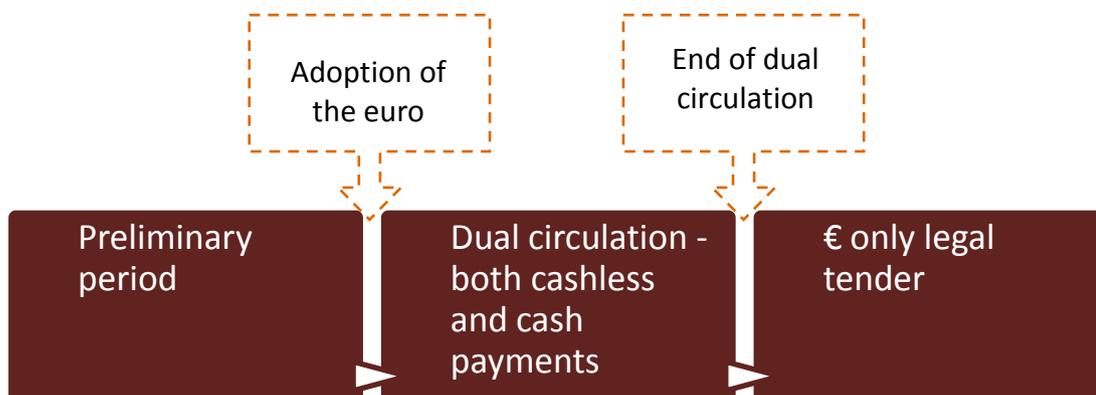
### 4.3 Reintroduction of transitional provisions and dual circulation

Other solution is the reintroduction of the transitional provisions and/or dual circulation similarly to situation when the introduction of the euro took place. This concept is also conditioned by the change of legislation, respectively amendment of the current legislative. From my point of view the agreement on such amendment would be faster than creation of a new legal act (see above). Simply summarized this approach is the inverse procedure to the implementation of the euro. There are totally three scenarios how the euro can be implemented: the Madrid scenario, the Big Bang scenario and the Phasing Out scenario.

The Madrid scenario is the approach which was used in setting up the legal framework and the timetable for the adoption of the euro at the beginning of the Euro zone. Firstly the exchange rates between euro and each member states' currencies were set up. Then the euro currency became the official currency and the national currencies were thought to be the sub-units of the euro and national currencies remain in circulation. The euro was used only for cashless payments. All the prices but were in both currencies. During this transitional period euro was used as “book money” and as a unit of account. Then after three years also the banknotes and coins were introduced and dual circulation began; both currencies were legal tender, but the national currencies were withdrawn from the circulation (collected by shops and banks and exchanged for the euro). After the short period of dual circulation only the euro remained acceptable for all the payments, but national currencies could be exchanged to euro. The timeline is depicted below in Figure 4.3.1.

**Figure 4.3.1 Madrid scenario of euro adoption**

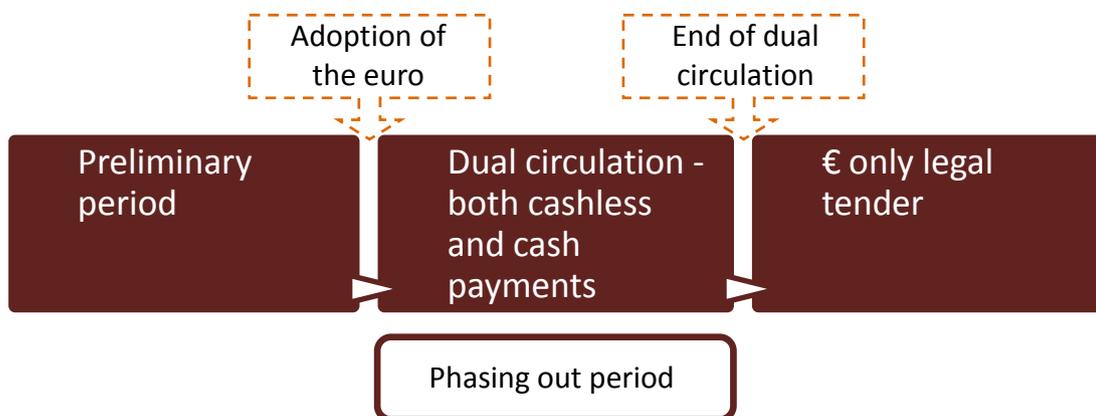
As the name of this scenario indicates, in the Big Bang scenario the euro usage begins the same day for both cashless and cash payments. Then the country has six months to withdraw national currency from the circulation and make the euro the only legal tender. On one hand this scenario is more coordination and preparation demanding, but from recent experience this scenario is faster and therefore cheaper than the Madrid solution. The new member states gained the advantage that euro was already established; hence all the new joiners are used this approach when introducing the euro. The difference can be easily seen in the figure below.

**Figure 4.3.2 Big Bang scenario of euro adoption**

Alternatively to the Big Bang scenario exist the Phasing Out scenario for the new joiners. Similarly to Big Bang scenario also this approach involves the same

starting point for the cashless and cash payment. The difference between the approaches is that under the Phasing Out scenario the new-joiner can for the phasing out period of up to one year use the national currency in some chosen fields (e.g. tax payments, contracts, SME's invoicing, etc.). The scenario is again depicted in the figure below.

**Figure 4.3.3 Phasing Out scenario of euro adoption**



In previous paragraphs there were summarized three possibilities how the euro was or can be adopted by the member states. But in the case of introduction of the parallel currency its attributes must be taken into account when selecting the right standpoint. For the cashless parallel currency, only the Madrid scenario involves necessary step, when only cashless payments were able in the new currency. On the other hand the Big Bang approach should be used when introduction of parallel currency banknotes and coins also take place.

#### 4.4 Suitable definition – a “grey zone” approach

Last but not least and slightly “grey zone” approach is in the definition of the “parallel currency”<sup>21</sup> and setting its attributes in the way which are not covered or are

<sup>21</sup> Since it will not be a pure currency, further in the text it will always be used in quotation marks to distinguish the difference.

not inconsistent with the Regulations or Treaties. This concept thus will not need the change of the legal code and therefore will be much time effective than the previous two possibilities. On the other hand this approach demands huge political will to establish the “parallel currency”.

## 4.5 Conclusion

According to study of Slovak national bank<sup>22</sup> the value of administrative and technical costs of whole economy on establishment of euro was estimated between 0.3 – 0.8% of GDP. The establishment of parallel currency is reverse operation and therefore administrative and technical costs must be taken into consideration. For Greek economy the implementation of parallel currency would mean the costs of about EUR 625-1 668 mill.

All the approaches are highly dependent on the political will and therefore it is highly probable that politicians would go from the easiest solution to the more complicated ones if barriers occur. From legal point of view the establishment of “parallel currency” is presently possible only under the “grey zone” approach. But the suitable definition can set limitations on the “parallel currency”. Therefore I see as the most probable the second option of re-establishment of transitional provisions and dual circulation.

There are several possibilities how a parallel currency can get into the function. If the implementation of parallel currency would require banknotes and coins, from my point of view the most suitable concept was proposed by Arno Gahrman (2011). He stated that the parallel currency should be issued as a part of wages and salaries of the public staff. As a second possible solution I see the establishment of virtual parallel currency similar to one proposed by Andresen (2012).

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<sup>22</sup> Studie vlivu zavedení eura na ekonomiku ČR (2007) p. 16

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# 5 Break-up of the Euro zone, Hard Restructuring or Middle Course

## 5.1 Secession from the Euro zone

This section is dedicated to “leaving the euro” concept which will be analysed from the practical point of view. Currently there are few scenarios out of which some are more probable than the other ones. A complete break-up of the Euro zone is one of the less probable, as well as the secession of the leading countries from the Euro area. Also the separation of the Northern core<sup>23</sup> member states which are considered to be close to optimal currency area, from the Southern economies is not the most possible approach. Based on the theory the most probable concept is the breakaway of the weak country or countries.

Leaving the Euro zone and therefore also the euro would have two consequences from monetary point of view. The new currency would have to be established and all domestic wages, prices and other values would have to be converted into new currency units at given exchange rate. Secondly this exchange rate would have to be adjusted to levels which would be in accordance with economic situation in the country. For our case when the weak country is the one that left the Euro zone, the most probable outcome would be the devaluation of the currency. Both these steps have to be included because the euro cannot be devaluated and only the redenomination would not bring changes.

According to Bootle (2012) there are three sections that the country must take into account when planning the exit of the Euro zone: *“the decision-making and implementation process; the process of and implications of redenomination; and impact of devaluation.”* Each of these three sections sets some barriers and

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<sup>23</sup> Germany, Austria, the Netherlands, Finland, Belgium and France

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approaches to secession of the euro and reestablishment of national currency which would be further developed below.

### 5.1.1 Decision-making and implementation process

Managing the process of making the decision and the process of reestablishment of national currency is not an action which can be done over night. Therefore the few questions arise. First of all whether the process should be planned in secret or publically known. From theory and also it is logical that if the plans are well publically known people will expect that after the exit of the Euro zone a new national currency will be devaluated and therefore it might have negative effects such as outflows of the capital out of the country, withdrawals of funds, runs on banks and other effects which lead to deepening the crisis and moreover it might have negative effects on the implementation itself. On the other hand keeping the plans in the secrets has also disadvantages. People and firms would not participate on the process and therefore they will not be prepared on the consequences. This might also worsen the mood within the country and lower the trust of people in the government. Hence the early stages of the process should be done behind closed doors and be announced to the public when prepared together with implementation of measures designed to lower adverse behaviour of economic subjects. This final stage of the implementation should then be done as quickly as possible.

In addition this process does not involve only the one specific country but also other countries of the Euro zone and also the rest of the European Union. The whole process of leaving the EMU should be discussed and developed together with other member states. Not only implementation of the parallel currency but also the secession of the country from the Euro zone should mean the amendment of the EU law. Moreover if the country would like to leave only the Euro area not the whole EU concept which is highly probable and perhaps leave only temporarily the proper amendment of the EU law would be necessary.

### 5.1.2 Redenomination process

Second step after the announcement of leaving the euro is exchange of the euro to new national currency. Also this process would have two levels. Firstly the appropriate exchange rate should have been set and afterwards the introduction of the new banknotes and coins. In this stage government should manage the whole process together with minimization the outflow of the capital from the country.

In this stage the exchange rate would probably be set 1:1 due to fact that it is almost irrelevant what the conversion rate would be. All the prices, wages, contracts and other values will be converted in this rate. This conversion rate would be fixed till the end of dual currency circulation during which the euro banknotes and coins would be exchanged to new currency units. Since the new banknotes and coins are introduced the exchange rate between these currencies would depreciate to appropriate levels according to foreign exchange markets.

After the exchange rate is set up the banknotes and coins should be introduced. There are few options that the country should do. Ideally the government should come up with new bank notes and coins. This is quite long and expensive procedure so it is probable that the state would look for other possibilities. One of them is the usage of euro banknotes and coins which would be modified to distinguish from the original euro. This procedure was used during the separation of the Czechoslovakia. The stamps were used to set the difference between the Czech and Slovak crown. It should be mentioned that using the euro with Greek national symbols is not possible since under present legal code they are taken as the euro no matter the national symbols and therefore they are present across the whole Euro zone and probably whole world. It would be therefore almost impossible to withdraw them from the circulation in the rest of the countries and the holders would be negatively affected by the devaluation afterwards. On the other hand since the euro would remain in other states the holders will not have any motivation to let to stamp their banknotes/coins due to fact that they would anticipate the devaluation. Another solution is the usage of virtual money, but from my point of view there are still barriers to have only non cash operations. The best example is that the small purchases which are mainly done using the cash or still many retailers have not the

terminal for non cash payments. Therefore I still see the newly printed banknotes and newly minted coins as the only effective option.

Both the processes stated above are closely connected with the withdrawal of money deposits from the bank accounts, run on banks, and hence the collapse of the banking system in the country. Since the people and firms are considered to be rational they would expect the devaluation from the release of the information about the secession from the Euro zone. Therefore the government should take appropriate measures for the period between announcement and the conversion date. To avoid the collapse of the banking system in the country, withdrawals of the money and also virtual transactions should be restricted to reasonable levels, similarly to closure of the banks in Cyprus to prevent the overnight bank collapse at the beginning of 2013.

### 5.1.3 Devaluation and its impact on the economy

Devaluation is the third step in the process of abandoning the euro and establishment of new national currency which is crucial to restore the competitiveness of the economy. The government should take into account when planning the process that the devaluation should not be overshoot during first months. If the process would be managed only by the markets (depreciation of the currency) it is likely that this overshoot will happen. Therefore the devaluation rather than depreciation would be present and thus the credibility and transparency of the government and its future monetary and fiscal policy is necessary to lower the risks and negative impacts of devaluation.

After the secession from the Euro zone the nominal exchange rate between new currency unit and other currencies (most significantly euro and US dollar) would fall, this is called the external devaluation. This would possibly bring the increase of domestic price level and therefore the real income of households would fall. The aim of the devaluation is to restore the competitiveness of the economy and therefore the increase of the GDP and ability of debt repayment. It should be mentioned that the public debt would be redenominated to new currency which have to be negotiated with the creditors in advance. Therefore it is really important for the country to

involve the rest of EMU/EU countries in the preliminary procedure. As was already mentioned the collapse of banking system is highly probable due to fact that people would withdraw their money because of the fear of devaluation. Therefore also after the adoption of new currency the government should adopt measures to protect the banking system.

The impact on the households would depend on the success of the implementation procedure. If the recession follows the establishment on new national currency then the further deepening of the crisis would follow, the unemployment rate would increase, the wages would be cut, prices would increase and therefore overall wealth would decrease. If the succession of the Euro zone would be successful and the country would be better-off than also the impact on the households would be positive.

After the redenomination prices of imported goods would increase which can lead to increase of process of domestic substitutes. Moreover the prices of exports would due to depreciation also increase which would therefore affect the price of exportable goods sold in the home country. So the prices of tradable goods would increase due to devaluation of new national currency. It is highly probable that the nominal wages would not rise at leads in first months due to rigidity and economic situation within the country. As a consequence the real wages would decrease. Also the real value of the savings would fall down. On the other hand the real value of redenominated loans would also decrease which is perceived as a positive effect on the debtors. The real value of loans which would not be redenominated would in contrary increase. Overall impact on households is rather negative since their wealth would most likely decrease.

## 5.2 Restructuring option

The withdrawal from the Euro zone and also the solution through parallel currency take advantage of external devaluation to regain the competitiveness of the economy. On the other hand the restructuring option is based on the internal devaluation which means the adjustment of domestic nominal wages and prices and

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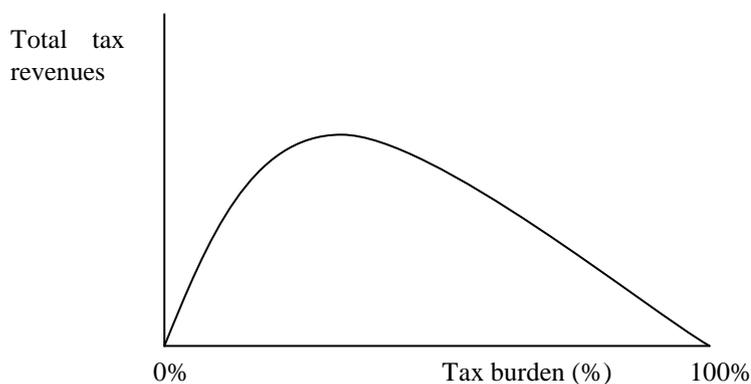
adoption of fiscal measures which would lower the unemployment, increase net export, make budget surpluses from the deficits and therefore the government would be able to manage the total debt. The main tasks which should be solved during the restructuring are: financial reform and restoration of the competitiveness.

Focusing on the financial side the governments are mainly pressurized into stabilizing the budget, therefore minimize the deficits or furthermore reach budget surpluses, and lower the total government debt. The budget of the government has two sides: revenues and expenditures. To take into account only one of them would not be sustainable solution in the long-term horizon. Therefore the analysis and optimization of main sources of revenues and main expenditure components would be necessary.

### 5.2.1 Taxation and tax evasion

The main source of the government revenues mostly comes from the taxation of personal income, corporate income, VAT or other taxes. Most troubled states are currently has currently the tax system complicated and tax evasion is present. Therefore the government should prioritize to reform the tax system to make it simple and favourable to minimize the tax evasion.

Based on the theory the relation between tax burden and total tax revenues is described by the Laffer curve (see below the Figure 5.3.1.1). According to this theoretical concept there is a break-even point of tax burden above which are total government revenues from taxation lower than they would be if the tax burden was lower. Practically is this theory hardly applicable since nobody knows where the break-even point is. On the other hand it can still be useful in the sense that if the government would decrease significantly the tax burden and the total revenues drop down only slightly it is highly probable that previously the tax rate was above the break-even point.

**Figure 5.2.1.1 Laffer curve**

Source: Cahlik (2006)

The tax system of the countries should be designed to be based on the indirect taxes rather than the direct ones. Indirect taxes are taxes which are collected from the person who bears the taxation indirectly by an intermediary. From the perspective of buyer they are mainly focused on the consumption (value added tax – VAT) or they are used to tax adverse behaviour of people (consumption of alcohol, cigarettes, fuel). From the seller's perspective the VAT is the tax on his value added. Under the present legal code the European Union sets the minimal VAT rates, which are presently 15% (standard rate) and 5% (reduced rate).<sup>24</sup> Low VAT could enhance the consumption and lower the effect of internal devaluation. The excise duties are on the other hand set by the home government and since they are designed to lower adverse behaviour of people they are generally high.

To the contrary the direct taxes are paid directly by the person who bears the taxation and mainly include the income taxes. The system of the income taxes should be simple, that means that tax advantages, tax exceptions and other special regimes should be eliminated or at least minimised. The simplification should have two consequences: it should lower the administrative burden of people and also the authority; since the system is clearer the opportunity for tax evasion should decrease. More over low personal income tax can support the labour market and the low corporate income tax can attract foreign investors.

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<sup>24</sup> Council Directive 2006/112/EC

### 5.2.2 Other revenues

Social security is similarly to direct taxes withdrawn from the personal income and evasion of the payments is quite common. The social security system should be likewise the tax system clear and simple to lower the evasion. Lowering the participation of the citizens on the system and letting them the possibility to save the money on they own would lower the current revenues and could cause social and economical problems in the future. Unified and simple IT system could be a solution for improvement of the monitoring of both the tax and social security revenues.

The state own companies could create also a significant share of the revenues. On the other hand when the companies are inefficient it can be also a large burden for the state. Therefore assessment of the efficiency and the position of the companies are necessary to obtain a portfolio of productive firms. The ineffective companies should be privatised or restructured afterwards depending on their strategic position for the country.

### 5.2.3 Wages, social programmes and pensions

State administration, government and also the companies owned by the state create a huge number of work places. Therefore salaries are one of the main expenditure and moreover the wages are often higher than in the private sector for corresponding positions. Many of these wages are based on the system of standard salaries with many bonuses and it is publically known that the public sector is dealing with the inefficiency and in many cases also with the corruption. Therefore restructuring of the system of working places and wages is necessary to lower these expenditures.

In the first step the wages of the public sector should be set to be competitive with wages in the private sector for similar positions. The benefits should not be automatically (e.g. 13th salary) but based on the evaluation of each individual. On the other hand the system of salaries should be clear and simple to avoid the abuse. The salaries should be a motivation for the people to work in the public sector nevertheless too low salaries could enhance the corruption.

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The second step should be the revision of working places, their efficiency and necessity and decrease of public employment. It is important to obviate the double-work, inefficient work and abuse of the position. If possible the positions or offices should be integrated or joined together. If suitable it would be better for the economy and labour market to decrease the working time or increase the flexibility of public employment (e.g. seasonal employment) rather than termination of the employee contract. More integrated IT system can accelerate the processes between institutions and hence it can lower the total administration costs.

Social programmes together with the pensions also comprise an important share on total expenditures. The social programmes are also often ineffective and abused; therefore more control of the system is necessary to lower the exploitation. The system should be even-handed and designed to help people in need, on the other side it should be motivating for unemployed to look for the job rather than remain on the state allowances. Similarly the pension system should be reformed if it is in the deficit and if it would be in deficits in the future. People should be more dependent on their own saving rather than on state support. Current pensions should be adjusted to correspond with current situation and to be comparable to other EU states.

#### 5.2.4 Other expenditures

Among other expenditures which significantly affect the budget of the governments belong for example the expenditures on medicals and medical treatments, military costs, state investment costs or expenditures on the elections. All these expenditures are necessary for the state function, enhancing the mood of citizens, creating work places and have other benefits. On the other hand these expenditures present a great portion of total costs and in the most cases there are a large number of possibilities for the savings.

Concerning the medical treatment and medicals the new system of health insurance and participation of people can be introduced. The generic medicaments should be supported when it is possible instead of the original and more expensive ones. Moreover in the hospitals owned by the state these medicaments should be

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preferred if they have the same effect. The citizens should participate on the costs of the treatment, for example the system of charges for the prescription, visit of the doctor, or charges for hospitalisation. All these charges should be imposed on people in the working age. Also the temporary working inability of public servants should be supervised to avoid the abuse.

Reduction of total expenditure is a necessary step to obtain balanced budget and as a consequence the government should consider the rate of return on the investment planned. Only needful investments with high rate of return should be done and open tenders could be the way to lower the total costs of the contract. Besides home companies also foreign companies should be able to participate on the tenders, however to enhance the domestic economy, the foreign companies should be allowed to participate only if majority of suppliers is from the domestic country. As a consequence the prices would be more competitive and the involvement of domestic companies would grow.

### 5.2.5 Labour market

The labour market of most of troubled countries deals with high unemployment rate and rigidity of wages. From theoretical point of view the wages are thought to be rigid at least when the lowering is needed. Workers' associations or trade unions often plays significant role in the bargaining process. It is necessary to adjust the wage and/or working hours faster. The government should implement measures to improve the position of firms during the negotiations and lower the power of trade unions. It should lower the minimal wage floor and revise the collective bargaining system through adoption of the legislative which make the renegotiation of the contracts easier. Furthermore the promotion of flexibility of wages and working hours could be helpful. The cut in the wages would lead to so called internal devaluation. The consequence of lower wages would be the drop in the production costs of the companies and therefore should led to decrease in prices and increase in the competitiveness. The labour productivity should increase as a result.

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The black market is also often present concerning the labour market. Undeclared work has two consequences: increases the unemployment rate and decreases tax revenues of the government. Therefore also this area should be more controlled and the contracted work should be promoted. The unemployed people who are receiving the unemployment benefits should be engaged in short-term low-qualified jobs for the state such as cleaning of the public zones, leaves raking, or administration, for low compensation or for the possibility to participate on the requalification courses.

### 5.2.6 Export and import

Most of the countries which are in the financial troubles also suffer from the negative balance of foreign trade, when these countries are net importers rather than net exporters. One of the reasons is the lack of competitiveness of domestic producers in comparison to foreign competitors. Therefore one of the aims of the governments during the restructuring should be the promotion of domestic producers and the promotion of export of domestic goods and lowering the volume of imports. Since the states are members of the EU the possibility to higher set tariffs and quotas is not possible. Hence the government has only limited options to lower the volume of the imported goods. The imports might decrease due to increase of competitive substitutes produced in the domestic economy. The increase in competitiveness should be therefore the key target of the government.

## 5.3 Parallel currency

The parallel currency concept takes the advantage from both previous approaches. According to Ludwig Schuster (2012) around thirty different concepts of parallel currencies for the Euro zone have already emerged. As was already shown on few examples the concepts differ and despite the fact that some of them were widely discussed in the papers, magazines or news they are still not treated as equal to other official political options.

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The approaches aimed at the recovery of the crisis-struck countries using different kind of tools. The parallel currency could be devaluated and the country can again use the monetary policy as useful policy instrument in most of the concepts. Besides the parallel currency should boost the economic situation of the country through decrease of the imports, get the foreign trade into balance or into surplus in better case. Both these tools are closely connected since the devaluation of the parallel currency would affect the exchange rate and therefore the export and import of goods and services.

But not only should the economical targets be taken into account. The parallel currency should enhance the ability of the government to repay its debt, but the government should also be able to meet its obligations to citizens, such as payment of pensions, social benefits, healthcare, or education. The adoption of the euro brought not only the positives but also negatives, for example the price level of the weaker countries increased and the end of prosperous era was not expected. The devaluation can affect the economic situation of the citizens negatively when the real value of saving would decrease or the price level can increase as a consequence of growth in prices of imports. The social aspect of the parallel currency is crucial because the citizens have to trust in the political situation in the country to accept the parallel currency and therefore to avoid the collapse of financial system of the country. Therefore in our analysis in chapter 6, the parallel currency that uses the external devaluation without necessity to leave the Euro zone to solve current financial problems of the EMU would be considered.

In comparison to the break up scenario the establishment of parallel currency would be probably less costly for the whole Euro zone. If one troubled country leaves it is highly probable that other will follow and the whole Euro zone would fall apart. Thomas Mayer (2012) from the Deutsche Bank assumes that the EMU exit would have fatal consequences on country's economy when the financial system would collapse and also with devastating consequences on political system and whole society. Issuance of the parallel currency could lower the probability of the bank runs and therefore also the collapse of the banking system of the particular country. Additionally it could be easier to obtain new funding under the parallel currency regime. Other problem that could emerge is the inability of domestic citizens, firms

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and also the country to repay their foreign liabilities which would not be redenominated into euro which could lead to bankruptcies and disorder in the member state. Moreover if the succession of the Euro zone would also mean the secession from the EU the country would lose all the benefits resulting from the membership such as money obtained from the cohesion or structural funds, free mobility of people, goods or services, or other. It is expected that the break-up of the European Union would have terrible consequences on the country with national default and social decay as a result.

Presently the politicians are still more supporting the idea of the internal devaluation and the restructuring option. Under this approach the most affected are the citizens and domestic firms. Especially the low income and middle income groups are affected most together with young people. The restructuring option often leads to social disorders and worsening overall wealth and mood of people. The internal devaluation is based on the decrease of the wages and therefore an increase of the real price level. The devaluation of the parallel currency on the other hand uses the external devaluation to increase the real price level. Therefore both these approaches have similar effect on the price level. Parallel currency alone can soften the impacts of hard restructuring since devaluation currency does not affect the labour market directly and if managed reasonably the negative effects could be spread in time.

There are also objections and criticisms regarding the parallel currency regime. The system where two currencies are used together is more complicated than the one where only one currency appears. Secondary as was already mentioned under current EU law the establishment of the parallel currency within the Euro zone is not legal and therefore the change of the European law would most probably be necessary. The approach could be only first step in the total break-up of the Euro area and therefore it jeopardizes other members of the EMU and also of the EU. Moreover it is a step back in the integration process.

Focusing on the more practical issues, people are rational and therefore the danger of the run on the banks and financial crisis also seems to appear during the establishment of the parallel currency. This is closely connected with the fact that the currencies would compete on the market of the troubled country and since the devaluation of the national currency would be anticipated by the people, hence there

is no motivation to keep the weak currency. In a fear of losing their saving they would also transfer them as fast as possible on the foreign accounts which support the uncertainty in the economy. Besides if the government would introduce the new currency as a share of payments to people, it could due to these expectations caused further social disturbances.

Last but not least is the fact that many of the parallel currency theories do not see the parallel currency alone as the solution and the theory is more or less backed up by the restructuring. Therefore I see the parallel currency as an instrument which should reduce the negative effects of the hard restructuring but it is hardly predictable that it would have the desired effect. From my point of view it would more likely postpone the implementation of necessary restructuring measures, worsen the atmosphere within the country and the EU, especially the mood of the people, firms and investors, increases the uncertainty together with large costs on establishment, administration and maintenance.

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## 6 Parallel Currency as a Solution to Greek Debt Crisis

In this chapter the case study on the establishment of parallel currency in Greece would be examined. The following approach does not represent any previously discussed theories but can be concerned as an alternative to them. At first the process of implementation would be analysed, followed by the devaluation process and the theoretical impacts on the export and import. These impacts would be afterwards simulated using the econometric model to prove or disapprove the hypothesis.

### 6.1 Establishment of the parallel currency in Greece

Primarily the establishment of functioning of parallel currency would have in this case four stages. The planning pre-stage would be followed by the first stage during which the dual currency circulation would be present concerning the domestic payments. In the second stage the managed devaluation by the state would be done which would be ensued by the third stage of depreciation of the currency. Final fourth stage would be devoted to reintroduction of the euro as the single currency.

The parallel currency should be planned secretly with involvement of the representatives of the Euro zone. The whole process should be coordinated by Greece with close cooperation with all the European institution, especially with the European Commission, the European Parliament, the European Council and the European Central Bank. The information about implementation of the parallel currency should then be announced to the public when all necessary actions are prepared to switch to parallel currency. The secrecy could avoid the collapse of the financial system of the country. When announcing, the Greek government should highlight that the parallel currency is only temporary and set the target year when it would come back to euro as the only currency and present the main short-term, medium-term and long-term actions which are planned to resolve the critical situation.

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The new currency should not be cashless but it should have the physical form, which means banknotes and coins should be issued. It would be probably easier to use only the banknotes in all the necessary values, let's call the new currency "Geuro"<sup>25</sup>. In this step the Greek government should print out new currency. The Geuro should be introduced by the state and then issued by the Central bank through commercial banks. To avoid the run on banks the deposits should not be redenominated. Each account would be divided into euro account and Geuro account and from the establishment day all new transactions between the state and the citizens should be done in Geuro. Moreover all the prices, wages and other necessary instruments would be redenominated into new currency. The Geuro should replace the euro in whole domestic transactions. On the other hand the cross border transactions would be able only in euro. To prevent the chaos in the EMU the usage (including the exchange of the currency) would be strictly restricted outside Greece.

In the first phase the firms and people would have to exchange their deposits from the euro to Geuro, but as was already mentioned since the redenomination of all the deposits would not take place, people would be able to exchange only necessary part of their savings depending on their needs and will. Similar situation would be in the case of firms. The exchange rate would be set 1:1 for the first phase of dual circulation within the economy. During this period the government would withdraw the euro and replace most of it within the country with the Geuro. This process would be done through commercial bank, when only limited part of total new deposits could be saved on the euro account; rest of them would be put on the Geuro account. This could motivate the people to not to circumvent the banking sector and save the money "under the pillow". This period would be slightly similar to dual circulation period when the Greece was accepting the euro. After the certain transition date all the domestic payments in the country should be denominated in the Geuro.

Since the introduction the exchange between the Geuro and euro would be possible in both ways. The exchange rate would not be floating but fixed by the government during the first phase at the rate equal one and afterward would be adjusted according to the devaluation process till the target exchange rate. When the country reaches the target rate the government should abandon the fixed rate and let it

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<sup>25</sup> This name for the parallel currency was proposed by Thomas Mayer from Deutsche Bank.

float freely. When also the freely floating rate stabilizes and the Greece exhibits competitiveness the government should start to negotiate the abandon of the parallel currency in favour of the euro.

This parallel currency solves the problems of the country in two main ways. First is the devaluation process which should restore the competitiveness of the country. Mainly it should increase the export of the domestic products and lower the imports from abroad. Secondly through the impact on the price level it should make the real wages lower and therefore the labour force relatively cheaper which again affects the foreign trade and in addition it should put the rigid labour market in motion. Secondly there should appear the inflow of the euro into the economy which would then be used to repay the euro denominated debts of the government. Partially it would be caused by the positive trade balance and besides that also the prohibition of the usage of the Geuro outside the country would bring the inflow of the euro through tourism. It should be mentioned that the conversion would be possible only between the euro and

Greece would officially remain in the Euro zone but the system of the parallel currency would be closer to the single currency system when the payments in the country could be done with Geuro. Therefore citizens and firms operating only within the country would deal only with one currency, the Geuro; hence the system would not be complicated for them and therefore their transaction costs would not increase much. Only the firms and people who operate internationally would experience the dual currency system.

## 6.2 Devaluation and depreciation process

The primary instrument which would be used to restore the competitiveness of the economy and solve the current fiscal problems of the Greek economy should be the devaluation of the currency which would be done by the government and the central bank through management of the exchange rate. As was already mentioned the exchange rate would be fixed during the second phase of the process with target exchange rate set in advance. It would not be exact value but a boundary in which the

target rate should end and more over this range could be modified in connection with the development of the economic situation. On the other hand dates of each step of devaluation should not be publically known. Expected modifications of the exchange rate would be then anticipated by the people and firms and therefore the market would adjust and the desired effect of devaluation would be lowered or would not be at all.

During the second stage the government would unexpectedly set the exchange rate both up and down with tendency to reach the target rate range, but the government should during the determination of the exchange rate take into account the hyperinflation threat. The unpredictability of the short-term movements of the exchange rate is crucial for preservation of the market's dynamics which is dependent on speculations. On the contrary the government have to regain the trust of people which is presently very low and therefore the government should avoid radical changes which would negatively affect the citizens more than necessary and these changes could also be first impulse for the hyperinflation. This period is expected to last at least 2 year.

Some economists suggest that the restoration of the appropriate exchange rate should be exclusively done by the market forces. From my point of view it would bring only chaos and the impact of such rapid change might be devastating for the Greek economy. Therefore the secondary goal of the controlled devaluation by the government should be the mitigation of these negative effects of the depreciation. When the devaluated exchange rate reaches the expected exchange rate, which should lie in the target exchange rate range, the fixed exchange rate should be abandoned in favour of free floating exchange rate.

Finally the depreciation stage should include the adaptation of the exchange rate based on the influence of the market forces. This process would have similar consequences as the depreciation stage, more over since the exchange rate would be exclusively based on the market the value would be the most proper. It is the time when the government should secretly start to plan the abandon of the parallel currency and reestablishment of the euro as the single currency. After the stabilization of the exchange rate this rate should be used to set the new conversion rate and the dual currency circulation should be implemented in the fourth stage. The

process of abandoning the parallel currency is comparable to the process of introduction of the euro in Greece in 2002.

### 6.3 Simulation of effects of the devaluation on Greek economy

For the purpose of the evaluation of the effects of the Geuro devaluation the suggested model was taken from Richter, Abadi and Borda (2013) since their approach is in some aspects the most similar to the one presented above. In their paper the model used the exchange rate as the key variable and then simulated the effects of the changes on the real economy. They used the multi-equation regression model based on the neoclassical theory and used the Two Stage Least Square (2SLS) approach to obtain the results for each equation. Their model tries to predict the effect of devaluation using the current macroeconomical data and the simulation assumes that the devaluation of the currency took place in 2011 and 2012.

They modelled three devaluation scenarios; devaluation by 15%, 30%, and 50% during 2011 and 2012. The devaluation of 15% of the exchange rate exhibit should boost the export by about 10% in the first year and 6% in the second. When Greece devaluate by the 50% the result would be increase of the exports in first year by 22%, respectively by 19% in the second. The following effect on the GDP would be lower and is assumed to be only 1% each year for the devaluation by 15%. On the other hand the higher the devaluation is the larger effect it has; it means that with 50% devaluation the impact on the GDP would be an increase by approximately 18% each year. It can be connected with the threat of the hyperinflation which was not examined or mentioned by the authors.

Focusing on the effect on the consumption which directly affects the gross domestic product is quite similar and therefore it can be assumed that the GDP is largely affected by the consumption. The domestic demand would not change much under the 15% devaluation, the increase would be about 5% each year when the devaluation would be 30% and when 50% the consumption would grow by 16% and 17% in 2011 and 2012. One of the key Greek problems is presently the

unemployment. The authors did not examine the effect on the unemployment but they choose the employment in their research. The positive impact on the employment rate would not be present when the devaluation would be only 15%. The employment would grow up markedly only during the 50% devaluation (by 11% in 2011 and 9% in 2012). Authors expect the reduction of the public deficit to EUR 1,000 mill under the first scenario. Under the second scenario they expected balance and for the third scenario the government should in surplus.

The analysis which was performed in this thesis is based on the same model with following changes. At first the number of examined equations was reduced and the analysis was performed to show the impacts of the devaluation on the export of goods and services, on the GDP per capita, domestic demand and finally the unemployment. The unemployment rate was chosen due to fact that present news and data exhibit significant increase of the unemployment rate in Greece. Due to threat of hyperinflation the scenarios were adjusted and the devaluation of 10%, 25%, and 40% was examined. More over the simulation was done for the years 2013 and 2014 due to fact that the concept of the parallel currency was not yet adopted and the future projection makes more sense. The total results should be found in the Appendix one, which is given to technical side of the analysis.

The obtained results significantly differ when comparing to results of Richter, Abadi and Borda (2013). First of all based on the data for the period 2000-2012 the relationship between the exchange rate and the export exhibits reverse relation when devaluation of the currency leads to decrease of the exports. The export would decrease by 13 to 23% depending on the scenario. The decrease of the export would affect also the GDP which would then decrease by around 11% in all cases in the first year and around 5 % in the second. The domestic demand would also fall by about 10% in both years. The unemployment rate would sharply increase and would reach more than 30% in 2014.

These results are quite surprising since they conflict with the theory when the devaluation should boost the export. For the analysis the exchange rate between drachma and dollar was used due to fact that from 2002 Greece had euro as a single currency and there were no changes of the exchange rate. Therefore because dollar is the second most important currency in the world it was chosen as a suitable tool. It

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was converted to drachma by application of the drachma-euro exchange rate which was set when Greece implemented the euro. This assumption was necessary to be done because the effect of devaluation could not be simulated on the exchange rate equal one. But the euro-dollar exchange rate is largely influenced by many other indicators which are not connected to Greece and therefore the rate might be skewed.

When comparing the data used by the Richter, Abadi and Borda in their analysis it should be mentioned that the export data between 2006 and 2011 significantly differs. This would probably be caused by the usage of different data sets. The authors mentioned that they used disaggregated data from the COMTRADE according to groups of products, but did not explain how the aggregated overall result was obtained. From my point of view the aggregated values should be equal or similar. The difference between COMTRADE and Eurostat aggregated data amounted up to EUR 9 bill. Therefore in this thesis the data from the Eurostat were used to maintain the same methodology of computation and not to influence the results by choosing more suitable datasets.

Based on the analysis was not proved that Greece could implement the parallel currency which would restore the competitiveness of the economy through the devaluation of parallel currency. Moreover the economic indicators worsen due to the devaluation. Further fact is that the model does not include the social factors of mood of the people which could highly influence the overall effect of devaluation. The situation in the country is critical and it might be late to implement such a radical approach.

## 7 Conclusion

In 2007, when the financial crisis arose, almost nobody expected that the European Union would have to solve one of the most complex problems in its recent history. The global economic crisis hit all the European countries hard, but the low performing countries of the Euro area felt the draught most, and present macroeconomic data does not bring much optimism. The unemployment rate in southern Euro zone countries is rapidly growing, the mood of the people is radically decreasing and social disorder and strikes are present on an almost daily basis. The critical situation in Greece and other weak, southern countries negatively affects the stability of the system and therefore the future of the EMU is being discussed among economists from all of the European countries. Many different concepts have been brought up recently. There are three possible solutions to the current situation without the necessity of establishing a fiscal union: the hard restructuring of the particular country, the secession of the country from the Euro zone and the parallel currency solution. This thesis was devoted to the concept of the parallel currency as a solution due to the fact that it is a radical and uncommon approach.

The basis of the concept involves the introduction of a complementary currency to the euro in the troubled countries, which would replace one or more functions of the euro. There were many different theories of parallel currencies developed by economists, and these differences are not only in the establishment procedure, but also in the definition of the complementary currency. Some of them are based on the velocity of the money; others take advantage of cashless operations to increase the money supply, but most see devaluation as the solution. Since the establishment of the euro as the sole legal tender in the EMU, countries lost the ability to influence the economy using monetary policy. A parallel currency should restore this ability and, through external devaluation, regain competitiveness and restore the ability of the government to service its debts.

Based on current European treaties and the legal code, the establishment of a parallel currency is not legal. But since the introduction of the complementary currency would most probably be coordinated by the country together with European institutions, it is therefore highly dependent on political will. Three possible solutions

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were identified: a change of the legal code to permit parallel currencies, reestablishment of transitional provisions and dual currency circulation and the “gray zone” approach, which is based on a suitable definition which is not covered in the legal code. The “gray zone” approach provides the easiest way to establishment of a parallel currency, but there is a high probability of complication. Hence the parallel currency could be effectively established under the reestablishment of transitional provisions, which need only a small change to the legislation. Additionally, it might be more politically acceptable.

Presently, the internal devaluation and restructuring option have more support from politicians than the parallel currency or EMU break-up options. On the other hand, the break-up scenario is presently being discussed more and more. Regarding the parallel currency using external devaluation to increase the price level and restore competitiveness; contrary internal devaluation is used during the restructuring of the economy. The internal devaluation and restructuring measures are often publically unpopular and leads to scepticism and reduces the mood of the people. Negative effects such as a large decrease of nominal wages, an increase in taxation, an increase in the real price level or redundancy among state employed people can be reduced by implementation of the parallel currency since devaluation of this currency would not affect the labour market directly and, if managed reasonably, the negative effects could be spread over time. But there are also some objections to and criticism of this approach, such as the thoughts that it is the first step in a break-up of the Euro zone, that it could slow down the integration process, possible collapse of the banking system due to a run on the banks, or the large costs associated with the establishment process.

The alternative concept of a parallel currency was developed in the last chapter of this thesis. This approach is based on the establishment of a parallel currency, which would be able to devalue. The currency would have the form of physical cash and would be controlled by the Greek government and Greek central bank. This complementary currency would replace the euro in all domestic payments, whereas international payments would be conducted only in the euro. The usage would be restricted to Greece only and the whole process would have four steps: dual currency circulation, devaluation, depreciation, and reestablishment of the euro as the

single legal tender. The devaluation together with restructuring of the economy would be crucial elements during the fight to regain competitiveness. To prove the theoretical effects of devaluation on the economy a simulation was performed. Based on Greek macroeconomic data, three scenarios of devaluation (by 10%, 25% and 40%) were analysed using the system of equations dependent on total economic exports. Not only did not the investigation prove the positive effect of the devaluation on the Greek economy, but the total impact of the devaluation on the economy would be devastating under all scenarios. Therefore, in my honest opinion, the parallel currency is not a suitable option for the Greek economy and the government should continue with implementation of the restructuring measures, or possibly consider secession from the Euro zone.

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### Online data sources:

Eurostat: <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/>

OECD: <http://www.oecd.org/>

# Appendix

## MULTIEQUATIONAL MODEL FOR GREECE

The model is designed to illustrate the effects of devaluation on the target variables. For the analysis the Two Stage Least Square method to resolve equations which are explained below. Three different scenarios were then simulated, the devaluation by 10%, 25% and 40%.

### Variables:

- Drachma-dollar exchange rate. 2000-2012. Source: University of British Columbia. Extracted on 13. 5. 2013.
- Gross domestic product. Euro per inhabitant. 2000-2012. Data for 2013 and 2014 computed from total GDP. Source: Eurostat. Extracted on 13. 5. 2013.
- Domestic demand. Euro per inhabitant. 2000-2012. Data for 2013 and 2014 computed from total domestic demand. Source: Eurostat. Extracted on 13. 5. 2013.
- Export of goods and services. Millions of euro. 2000-2014. Source: Eurostat, Extracted on 13. 5. 2013.
- Import of goods and services. Millions of euro. 2000-2014. Source: Eurostat, Extracted on 13. 5. 2013.
- Production in industry. 2010=100%. Volume index of production. 2000-2012. Data for 2013 and 2014 are estimates based on the trend. Source: Eurostat. Extracted on 13. 5. 2013.
- Harmonised Index of Consumer Prices (HICP). Annual average rate of change. Source: Eurostat. Extracted on 13. 5. 2013.
- Unemployment rate. Annual average. Total. %. 2000-2012. Data for 2013 and 2014 are estimates based on the trend. Source: Eurostat. Extracted on 13. 5. 2013.
- Average number of actual weekly hours of work in main job. Total employed persons. 2000-2012. Data for 2013 and 2014 are estimates based on the trend. Source: Eurostat. Extracted on 13. 5. 2013.
- Government surplus/deficit. Millions of euro. 2000-2014. Source: Eurostat. Extracted on 13. 5. 2013.

**Results:**

Model : OLS, using observations 2000-2012 (T = 13)

Dependent variable: EX\_ga

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	84949.6	7031.41	12.0814	<0.00001	***
GRD_USD	-140.959	24.1986	-5.8251	0.00011	***
Mean dependent var	44565.50	S.D. dependent var		8187.360	
Sum squared resid	1.97e+08	S.E. of regression		4231.151	
R-squared	0.755183	Adjusted R-squared		0.732927	
F(1, 11)	33.93160	P-value(F)		0.000115	
Log-likelihood	-125.9133	Akaike criterion		255.8267	
Schwarz criterion	256.9566	Hannan-Quinn		255.5944	
rho	0.291749	Durbin-Watson		1.365055	

Model: TSLS, using observations 2000-2012 (T = 13)

Dependent variable: DD\_pcap

Instrumented: EX\_ga

Instruments: const GRD\_USD IND\_2005 GOV\_ds HICP\_change WH\_avr  
UNEMP\_tot

	<i>Coefficient</i>	<i>Std. Error</i>	<i>z</i>	<i>p-value</i>	
const	37936.7	20321.4	1.8668	0.06192	*
EX_ga	0.129083	0.0294982	4.3760	0.00001	***
IND_2005	120.182	16.7506	7.1748	<0.00001	***
GOV_ds	-0.0779892	0.0203441	-3.8335	0.00013	***
HICP_change	-212.655	78.7268	-2.7012	0.00691	***
WH_avr	-764.151	466.852	-1.6368	0.10167	
UNEMP_tot	-355.503	20.1021	-17.6848	<0.00001	***
Mean dependent var	19253.85	S.D. dependent var		3030.571	
Sum squared resid	253606.5	S.E. of regression		205.5912	
R-squared	0.997705	Adjusted R-squared		0.995410	
F(6, 6)	431.5891	P-value(F)		1.23e-07	
Log-likelihood	-207.4367	Akaike criterion		428.8735	
Schwarz criterion	432.8281	Hannan-Quinn		428.0606	
rho	-0.108959	Durbin-Watson		2.170344	

Model: TSLS, using observations 2000-2012 (T = 13)  
 Dependent variable: GDP\_pcap  
 Instrumented: EX\_ga  
 Instruments: const GRD\_USD GOV\_ds IM\_ga DD\_pcap

	<i>Coefficient</i>	<i>Std. Error</i>	<i>z</i>	<i>p-value</i>	
const	201.713	130.568	1.5449	0.12237	
EX_ga	0.0933129	0.00430906	21.6550	<0.00001	***
GOV_ds	-0.00863964	0.00309345	-2.7929	0.00522	***
IM_ga	-0.085759	0.0047553	-18.0344	<0.00001	***
DD_pcap	0.96065	0.0182162	52.7362	<0.00001	***
Mean dependent var	17323.08	S.D. dependent var		2700.356	
Sum squared resid	19341.55	S.E. of regression		49.17005	
R-squared	0.999779	Adjusted R-squared		0.999668	
F(4, 8)	8983.269	P-value(F)		1.23e-14	
Log-likelihood	-193.1704	Akaike criterion		396.3408	
Schwarz criterion	399.1656	Hannan-Quinn		395.7602	
rho	-0.464203	Durbin-Watson		2.781340	

Model: TSLS, using observations 2000-2012 (T = 13)  
 Dependent variable: UNEMP\_tot  
 Instrumented: DD\_pcap  
 Instruments: const IND\_2005 HICP\_change WH\_avr GRD\_USD

	<i>Coefficient</i>	<i>Std. Error</i>	<i>z</i>	<i>p-value</i>	
const	249.18	63.2553	3.9393	0.00008	***
DD_pcap	-0.00195257	0.000355894	-5.4864	<0.00001	***
IND_2005	0.349271	0.0897906	3.8898	0.00010	***
HICP_change	-1.05493	0.433539	-2.4333	0.01496	**
WH_avr	-5.49893	1.41379	-3.8895	0.00010	***
Mean dependent var	11.63846	S.D. dependent var		4.542859	
Sum squared resid	13.87889	S.E. of regression		1.317141	
R-squared	0.954379	Adjusted R-squared		0.931569	
F(4, 8)	18.69118	P-value(F)		0.000403	
Log-likelihood	-130.9592	Akaike criterion		271.9184	
Schwarz criterion	274.7431	Hannan-Quinn		271.3377	
rho	-0.124660	Durbin-Watson		1.912458	

**Projection (year on year % change):**

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10% devaluation	2013	2014
Domestic demand (per capita)	-8	-7
GDP (per capita)	-9	-2
Unemployment rate	13	19

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25% devaluation	2013	2014
Domestic demand (per capita)	-10	-10
GDP (per capita)	-11	-4
Unemployment rate	16	21

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40% devaluation	2013	2014
Domestic demand (per capita)	-12	-12
GDP (per capita)	-12	-6
Unemployment rate	19	23

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