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CZECH
UNIVERSITY
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DIPLOMA THESIS

Reasons behind economic integration: Economic coherence of EU countries

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DIPLOMA THESIS ASSIGNMENT

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Economics and Management

Thesis title

Reasons behind economic integration: Economic coherence of EU countries

Objectives of thesis

The objective of this diploma thesis is to find out whether the EU is coherent entity of coutries with similar economic characteristics and performance. If there exist certain level of heterogenity among EU economies and what is the influence of such disparities on the course of crises in 2008.

Methodology

Gathering of relevant and comparable statistical data about choosen economies in order to descibe current situation and decide whether the EU is optimum currency area. In order find out the heterogenity in the EU, cluster analysis as a statistical method will be used.

Schedule for processing

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The proposed extent of the thesis

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Keywords

Economic integration, European union, Economic reasons behind economic integration, optimum currency area, European monetary union, cluster analysis

Recommended information sources

Baldwin, Richard E., and Charles Wyplosz. The Economics of European Integration. New York: McGraw-Hill Higher Education, 2012. Print.

Krugman, Paul R., and Maurice Obstfeld. International Economics: Theory and Policy. Boston [u.a.: Pearson Addison - Wesley, 2009. Print.

Somers, Frans, and Ian Stone. European Union Economies: A Comparative Study. Harlow, UK: Longman, 1998. Print.

European commission reports : Convergence reports, Economic papers, Annual Growth Survey

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Declaration of integrity

I declare that I have worked on my Diploma Thesis called „Reasons behind economic integration: Economic coherence of EU countries“ solely by myself under management of my supervisor and I have used only quotations and resources of information mentioned at the end of the thesis. As the author of the diploma thesis I declare that I have not violated any copyright rules and author rights of the third parties.

In Prague, March 28th 2014 ___________________________

Caletka Petr

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Reasons behind economic integration: Economic coherence of EU countries

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Důvody pro ekonomickou integraci: Ekonomická koherence zemí EU

Summary

This diploma thesis investigates the issue of economic integration with focus on the European Union. The main objective of this thesis is to find out whether the EU is coherent entity of countries with similar economic characteristics and performance or if there is excessive level of heterogeneity among EU countries.

It is divided into two main parts. The first part is literature overview of investigated topic and it introduces the theory of regionalism, motives for regionalism and its effects on the economy. Furthermore, examples of regional groupings in the world are presented. At the end of the chapter the process of recent global financial crisis is described with emphasis on the impact on the EU Member States.

The second part includes the finding of the research that was conducted for the purposes of this thesis. The first part of the analysis deals with testing of compatibility of the optimum currency area criteria with selected members of the Economic and Monetary Union of the EU. The second part of the analysis examines the homogeneity / heterogeneity across the whole EU. Findings obtained in the practical part are summarized and assessed at the end of the thesis.

Keywords: economic integration, European Union, optimum currency area, regionalism, multilateralism, cluster analysis, European Monetary Union

Souhrn

Tato diplomová práce pojednává o problematice ekonomické integrace se zaměřením na Evropskou unii. Hlavním cílem práce je zjistit, zda je EU koherentní skupina států s podobnými ekonomickými ukazateli a výkonností nebo, zda je mezi členskými státy přílišná míra heterogenity.

Práce je rozdělena do dvou hlavních částí. První část je teoretická a seznamuje čtenáře s teorií regionalismu, motivy pro regionalismus a jeho vlivy na ekonomiku. Dále jsou představeny některé příklady regionálních uskupení ve světa. V závěru kapitoly je popsán průběh nedávné světové finanční krize s důrazem na dopady na členské státy EU.

Druhá část zahrnuje výsledky výzkumu, který byl zpracován pro účely této práce. V první části analýzy je testována slučitelnost kritérií optimální měnové oblasti s vybranými členy Evropské měnové unie. Druhá část analýzy zkoumá homogenitu / heterogenitu celé EU. Poznatky získané na základě těchto dvou analýz jsou shrnuty a vyhodnoceny v závěru diplomové práce.

Klíčová slova: ekonomická integrace, Evropská unie, optimální měnová oblast, regionalismus, multilateralismus, shluková analýza, Evropská měnová unie

List of abbreviations

ACN	Andean Community of Nations
AEC	African Economic Community
APEC	Asia-Pacific Economic Forum
ASEAN	Association of Southeast Asian Nations
AFTA	ASEAN Free Trade Area
CACM	Central American Common Market
CARICOM	Caribbean Community and Common Market
COMESA	Common Market for Eastern and Southern Africa
ECB	European Central Bank
EFTA	European Free Trade Association
ERM	European Exchange Rate Mechanism
FTA	Free Trade Agreement
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
IMF	International Monetary Fund
LDC	Least Developed Country
MERCOSUR	Mercado Común del Sur – Southern Common Market
NAFTA	North American Free Trade Agreement
OECD	Organisation for Economic Co-operation and Development
PTA	Preferential Trade Agreement
RTA	Regional Trade Agreement
SAARC	South Asian Association for Regional Cooperation
SAFTA	South Asian Free Trade Agreement
SAPTA	South Asian Preferential Trade Agreement

SICA	Central American Integration System
SACU	Southern African Customs Union
TRIPS	Agreement on Trade Related Aspects of Intellectual Property Rights
WTO	World Trade Organisation

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1. Introduction

It is perhaps human nature that our society tends to organize into groups that share common characteristics. One of the basic structures of self-determination of people and their belonging to a certain group are national states. States that were throughout our history created, they were disappearing or they fought each other. However, compared to thousands of years of human history, the last hundred years is fundamentally different in the fact that the frontiers between these states, distance and geographical location of countries cease to be an insurmountable barrier. On the other hand, especially the last 50 years, we have witnessed the process of globalization, when economies and societies from the opposite sides of the world influence each other, work together and communicate on a daily basis.

Just as within the territory of any country there is a legal framework that governs legal relations between citizens, the globalized economy needs its legal framework governing relations between states. The institution which seeks to create rules that would regulate relations in the globalized economy is the World Trade Organization (WTO). WTO represents multilateral system. However, this system has shown a high degree of rigidity and inefficiency in reaching consensus on common issues. This problem was mainly due to the increase of WTO members and fundamentally different interests. The answer to the problems of multilateralism was regionalism, thus the process of integration of countries within one geographical region. Currently, the most successful regional grouping in the world is the European Union which covers major part of the European continent and 28 countries participate in this regional integration. Prior to admission to the EU it is expected that a country has reached a certain level of convergence to other members. Any disparities in economic level can subsequently cause problems.

World economy has experienced very deep economic crisis in last few years. The European Union was hit by the crisis perhaps more than other regions and it revealed chronic problems of some Member States. It is therefore questionable whether the desired degree of convergence of all members was achieved and whether the EU is economically coherent group of states. This question concerns all EU members, but especially those who have adopted the common currency and their fate is therefore tied even more. Membership of some countries in the euro area is in dispute in context of the crisis and it raises the issue of high heterogeneity among member states. In 2010, real GDP growth was 4% in Germany, while Greece recorded a negative growth of -4.9%.

2. Objective and methodology

2.1. Objective of the thesis

The main objective of this thesis is to find out whether the EU is coherent entity of countries with similar economic characteristics and performance or if there is excessive level of heterogeneity among EU countries. What is the influence of such disparities on the course of the crises in 2008? We can empirically prove that there was different progress of crisis in European countries. It can imply that the proper level of economic convergence was not achieved and the membership of certain countries is questionable. Two hypotheses will be tested. First, the European Monetary Union (EMU) does not constitute an optimum currency area (OCA). Second, the European Union is composed of several clusters of countries with different economic characteristics.

2.2. Methodology

During the methodological preparation and literature overview it was used a sufficient amount of monographs as well as articles and internet sources in order to get theoretical background concerning the topic. As the thesis concerns mainly the problematic of the European Union, necessary statistical data was gained from Eurostat (EU statistical office) and from World Trade Organization statistics.

The thesis is divided into two main parts. First part provides insight into theory of multilateralism and regionalism, particularly which types of regional integrations do we know, the reasons behind the decision countries integrate to bigger groups, as well as economical implications of regional integration. Beside the analysis of the European Union the thesis involves also examples of regional integrations from different parts of the world. The theory of optimum currency area is described with emphasis on criteria which are necessary to be met in order to have monetary union. Recent crisis is examined and so-called group of PIIGS countries is identified.

Second part of the thesis uses comparative analysis of macroeconomic data to determine whether the EMU is optimum currency area. Time series which describe chosen economies will be compared and EMU will be tested whether it constitutes optimum currency area. In total there are six OCA criteria tested among seven EMU founding states.

Statistical method cluster analysis is employed to find out the EU membership structure and the level of heterogeneity/homogeneity among countries. Each country is described by 14 indicators that together form a data set for cluster analysis. Cluster analysis is run with data for year 2007 and 2012 in order to compare the situation before and after crises.

3. Literature overview

3.1. Globalisation

Globalization is a phenomenon of our time. While the term globalization is relatively recent, the term "global" or worldwide is used since the 19th century. First time the term "globalization” has appeared in dictionary (of American English) in 1961. Since that milestone it has expanded into all political, economic, technical and social sectors.

Despite the frequent use of the term globalization, its meaning remains elusive, making it difficult to clearly define, as well as provide a comprehensive theoretical background. According to Scholte[1] definition of globalization rather lies in the negative list, therefore, that there is a greater account of what globalization is not than what globalization really stands for. Globalization can manifest itself in a wide range of dimensions, but the main and the most advanced we consider economic globalization. Other dimensions of globalization, particularly political and cultural, have the secondary role. Globalization is perceived as a set of economic processes and activities that has implications across societies. In this context, it is the economic globalization that drives the whole process. The common feature of all these dimensions is considered the element of separation of human activities outside the boarders of national state in which it is performed.

Generally speaking, globalization is a process whose result is that individuals and societies in one part of the world are influenced by events, decisions and activities that take place on the other side of the world. There is decrease of importance of geographic distance and on contrary increase of the interdependence in the world.

Classic definition of economic globalisation refers to increasing integration of national economies through flows of goods, services, capital, information, technology, labour as a result of removal of barriers by states. In this context, globalisation in considered as a process of intensive **internationalisation.** Internationalization lies in overlapping of economic activity across national borders and the expansion of international economic relations that connect individual nation states. Globalisation closely relates to this process but at the same time it overlaps it.

[1] SCHOLTE, J. A. *What is Globalization? The Definitional Issue – Again,* p. 4.

Organisation for Economic Cooperation and Development (OECD) defines globalisation as *"increasing internationalisation of financial markets and of markets for goods and services. Globalisation refers above all to a dynamic and multidimensional process of economic integration whereby national resources become more and more internationally mobile while national economies become increasingly interdependent."*[2] According to International Monetary Fund (IMF) globalisation is defines as "*the acceleration in the pace of growth of international trade in goods, services, and financial assets relative to the rate of growth in domestic trade."*[3]

The process of globalization can be divided into three waves. The first wave dates from 1870-1914, but that was disrupted by World War I and II . The second wave of globalization came in the 50s and 60s of 20th, but it was stopped by global crises in 70s. Since then we talk about third wave of globalisation. It is clear that this is not just a sudden phenomenon, in which economies are more and more involved by increasing flows of goods , services , capital, information, technology and labour, however it can be understood as an ongoing development approach which is called the internationalization of the world economy. Although globalization is undoubtedly based on the intense process of internationalization, there are several differences. Internationalisation is closely related to firms, international companies and the way they compete on global scale.

The emergence of current wave of globalization is linked to several circumstances. An important milestone in the transition from fixed exchange rate in the period 1971-1973 on the floating exchange rate. Together with the oil crisis of 1973 gave an impulse to international companies to expand to new markets in developing regions to maximize profits and minimize costs. Numerous multinational companies has been formed throughout the world, it has led to further interconnection and numerous innovations in transport and communication technologies. In particular, the trade in goods and services on the international level has become a matter of public interest. International trade is understood by public as an example of globalization of the world economy. The growth in foreign trade, thanks to the revolution in transport, was twofold the growth in world GDP. This development worldwide can be explained by elimination of obstacles in foreign

[2] OECD. *Handbook on Economic Globalisation Indicators*, p.11
[3] IMF. *World Economic Outlook. Globalization and Inflation*, p.97

trade,engagement of small economies to the global economy and the rapid fall of transport costs of goods to the market.[4]

3.2. Regionalism and multilateralism

The process of liberalization should take place primarily at the national level, but governments are usually not willing to implement sufficient reforms. Therefore, the process of liberalization is the most visible at the level of foreign economic relations. The process leading to liberalisation of barriers to economic activity worldwide we call multilateral liberalisation or multilateralism. While globalization was defined as rapid growth of economic activity on global level, multilateralism represents the deliberate activity on global level, which leads to the removal of economic activity barriers at the borders of national states. Multilateralism can be understood as a reason for globalisation, on the other hand globalisation is reason for multilateralism. In the first case multilateral cooperation leads to development and progression of international flows of goods, services and production factors. However, globalisation increases the flexibility of world economy needed to manage liberalisation processes giving the multilateralism a reason to exist. Relation between globalization and multilateralism is then mutual. To ensure the successful and dynamic development (in economic issues) of multilateralism, its institutional arrangement is necessary. Institution that ensures the course of multilateral negotiations is World Trade Organization (WTO). WTO establishes a framework for national trade policies. The WTO's role is to promote trade liberalization by establishing rules; the aim is to help exporters and importers to manage their activities. The WTO provides a framework within which it manages international negotiations; it guarantees that all rules and regulations are applied equally to all participants. It provides a legal and institutional framework for the implementation of agreements. WTO also implements these agreements and the different rules that may arise from its member countries. From a historical perspective is particularly important its part, General Agreement on Tariffs and Trade (GATT). Agreement was signed in 1948 and during the final Uruguay round of negotiations in 1995 it was transformed into its present institutional form-WTO. In 2013 WTO’s member base counts for 159 countries. In addition to the GATT, which still deals with liberalization of trade in goods, the WTO system is also based on the General

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[4] CIHELKOVÁ, E. *Nový regionalismus – teorie a případová studie (Evropská unie),* p. 62-67

Agreement on Trade in Services (GATS) and Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).

Five core WTO principles are especially important.

1. **Trade without discrimination**

   a) **Most-favoured-nation (MFN)** means that under WTO agreement, countries are not allowed to discriminate between their partners. If someone is granted a special favour which can be lowering custom duty rates, then it must be applied for all other WTO members.

   b) **National treatment** which says that foreigners and locals should be treated equally. Locally produced goods and imported one should be treated under the same conditions – at least after the foreign goods entered the market. It involves also the same treatment of foreign and domestic services, local trademarks, copyrights and patents.

2. **Freer trade** principle is based on gradual lowering of trade barriers. The most concerned barriers include customs duties and measurements such as import bans or quotas. From time to time issues like exchange rate policies have been also discussed.

3. **Predictability** through binding of agreement and transparency. A country promise not to raise a trade barrier. A country can change its binding agreements by negotiating with trading partners. Bounding of products promotes a higher level of market security for traders and investors and therefore predictability. Improvement in predictability leads to transparency, making countries' trade rules as clear and public as possible in order not to cause confusion.

4. **Promoting fair competition** as the rules of the WTO try to designate what is fair and unfair and how governments can respond caused by unfair trade. WTO is partly a "free trade" institution as there exist certain form of protectionism allowed.

5. **Encouraging development and economic reform** because three quarters of WTO members are developing countries. These countries need flexibility in the time they

take to implement the system’s agreements. They are given transition period. Especially the least-developed countries (LDC) need a technical assistance.[5]

There have been eight rounds of trade negotiation since the creation of GATT in 1947. It is obvious that the more countries were involved in negotiation the longer time it took to reach consensus.

Table 1 : GATT trade rounds

Year	Place/name	Countries
1947	Geneva	23
1949	Annecy	13
1951	Torquay	38
1956	Geneva	26
1960-1961	Geneva (Dillon Round)	26
1964-1967	Geneva (Kennedy Round)	62
1973-1979	Geneva (Tokyo Round)	102
1986-1994	Geneva (Uruguay Round)	123

Source: WTO, http://www.wto.org/

A ninth round, under the Doha Development Agenda, in now underway. The complicated issues include agriculture, especially the conflict between developed countries and developing countries, as well as issues of intellectual property.

Table 2 : WTO Ministerial Conferences

Date	Place
9-13 December 1996	Singapore
18-20 May 1998	Geneva
November 30 – December 3, 1999	Seattle
9-13 November 2001	**Doha**
10-14 September 2003	Cancún
13-18 December 2005	Hong Kong
30 November – 2 December 2009	Geneva
15-17 December 2011	Geneva
3-6 December 2013	Bali

Source: WTO, http://www.wto.org/

[5] WORLD TRADE ORGANIZATION. *Understanding the WTO*, p.10-13

Related phenomenon to significant growth in number of members of the WTO is the problem to achieve consensus among states.

As a logical solution to the problem of significant heterogeneity in member base of the WTO, an organization seeking to global trade liberalization is **regionalism.** Regionalism basically endeavours integration of economies on the same level of development or economies with significant interest in common economic relations. Regionalism, the same as multilateralism, is a specific response to globalization. In relation to multilateralism, regionalism is violation of the principle of non-discrimination. Regional integration discriminates non-participating countries, because its effect is to remove barriers to trade flows only between members. Regional integrations are usually created on a basis of special type of agreements. Regionalism corresponds to the increase of formal regional agreements between countries i.e. regional agreements on the institutional level which are formal and which institutionalize integration. Different types of agreements are collectively called as Regional Trade Agreements (RTA). These agreements are concluded according to exemptions from WTO principles and they are registered at this organization. Establishment and functioning of regional integrations are regulated by the following articles, which formulate exceptions to the rules of multilateralism:

- **Article XXIV of GATT** provide for the formation and operation of customs unions and free-trade areas covering trade in goods. States may violate the principle of MFN only when the following conditions are met: Regional agreement will not increase protectionism (duties, etc.) against non-members; protectionism cannot overlap the level that existed before the creation of the regional integration. Customs duties within the grouping must be reduced to zero.
- **Article V of GATS** governs the conclusion of RTAs in the area of trade in services, for both developed and developing countries. Rules are practically identical with conditions related to trade in goods.
- **Enabling Clause** refers to preferential trade arrangements in trade in goods between developing country Members. It enables to member countries of WTO to provide more favourable treatment to developing countries, also it creates conditions for conclusion of preferential agreements among developing countries and there is special arrangement for least-developed countries. However such an

action must lead to support of growth in developing countries, and not only create barriers for trade with other countries.[6]

Table 3 : Regional Trade Agreements s in force

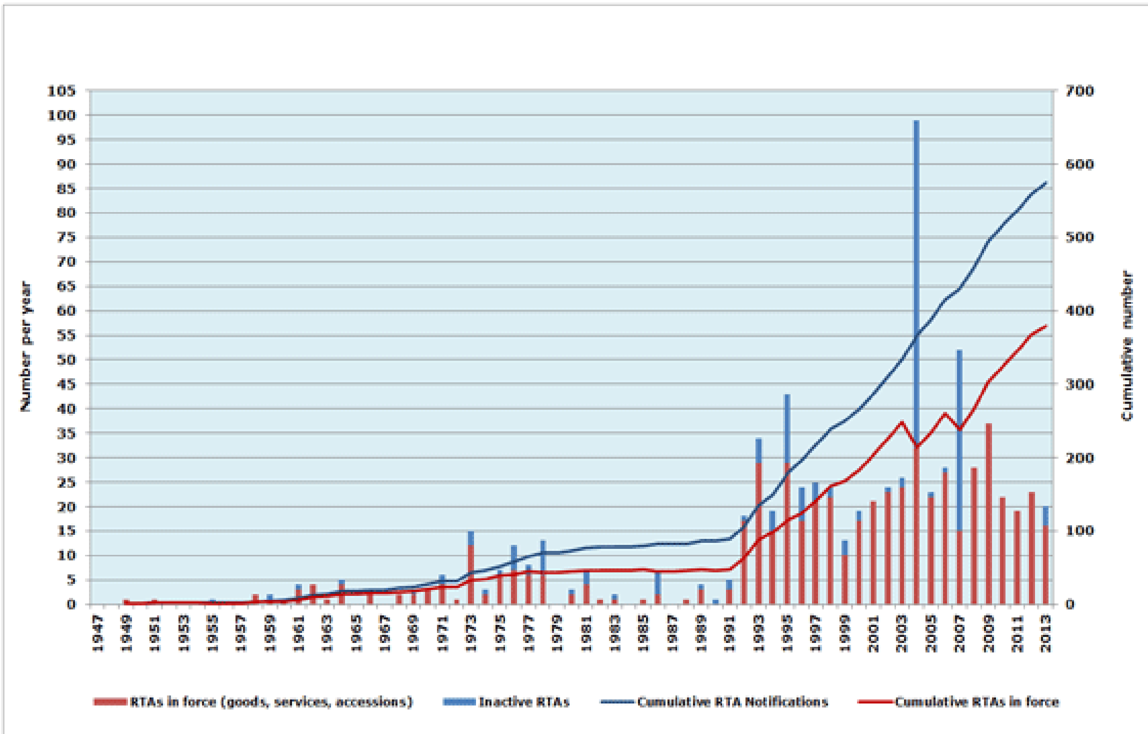
WTO's rule on RTA	Number of RTA
GATT Art. XXIV (FTA)	210
GATT Art. XXIV (CU)	17
Enabling Clause	37
GATS Art. V	121
Total	385

Source: WTO, http://www.wto.org/

[6] WTO. *Regional Trade Agreements-Rules* [online]

WTO's Members are obliged to notify participation in one or more RTAs. There is a significant progress in concluding of trade agreements in last two decades. In the period 1948-1994, GATT registered 124 notifications of RTAs, however since the foundation of the WTO in 1995 the number of notifications multiplied more than three times. Over 400 arrangements related to trade in goods and services have been notified. The chart shows that important increase in number of regional trade arrangements occurred after the collapse of the bipolar world. Recently, it also seems that there is decline in number of inactive RTAs, which either disappear or integrate with others.

Chart 1 : Evolution of Regional Trade Agreements in the world, 1948-2013



Source: WTO, http://www.wto.org/

3.2.1. Three types of regionalism in the twentieth century[7]

Regionalism as a process of formation of regional integration in the world economy dates back to the early 20th – century. During this period, we can distinguish three waves of regionalism, where applied tools and principles of regionalism differ significantly.

The first wave is associated with the development in the 30s and 40s of 20th century. So it is associated primarily with the attempts of Germany and Japan to become

[7] TELÒ, Mario. *European Union and New Regionalism: Regional Actors and Global Governance in a Post-hegemonic Era*, p.2-4

regional hegemonic powers in Europe and the Asia Pacific region. This wave is called a **"malevolent regionalism"** and ultimately led to the outbreak of the Second World War. This wave differs from the further development of regionalism mainly in that its primary motive was not the pursuit of economic efficiency, but the geopolitical expansion of the two regional powers. However, during the first stage of regionalism the first agreements leading to the liberalization of economic relations based on economic motives are registered. A number of historical integration attempts, nevertheless, did not lead to success. So as the most important representative of the initial wave of regionalism we consider regional integration of Belgium, the Netherlands and Luxembourg - Benelux. Its foundations were laid in 40s of 20^{th} century.

Second wave of regionalism, **the hegemonic regionalism**, refers to the 50s to 80s of the 20th century and is mainly related to the Cold War, which heavily affected development of regionalism. The tense political situation of the bipolar world was paradoxically linked with relative stability of the international economic environment, which gradually dominated the leadership role of the United States, which were almost the sole supporter of multilateralism and they have not been practically engaged to processes of regionalism. Their attitude was, along with the rigidity of bipolar arrangement of the world, main reason for the relatively weak, at least compared to the current wave of regionalism, dynamics of development of regional integrations. Nevertheless, even during the second wave of regionalism we talk about the continuous growth of regional trade agreements, which gradually increased the importance of regionalism as the dominant trend in the global economy. The most important integration grouping of this wave of regionalism is the European Union. Establishment of significant integration process on the European continent provoked a strong response in the whole world economy and it has become a strong pattern for the development of further regional integration, especially in the developing world. Reaction on the strongly institutionalized integration – EU – was the second grouping in Europe – European Free Trade area (EFTA), whose members were supporters of more liberal relations. It was the United States who supported the formation of the European Union and the European Free Trade Association. It is probable that they followed their own political interests, as they needed a strong and capable ally against the Soviet Union. Therefore, they also showed some tolerance to relatively strong protectionism that still prevailed in Europe.

A third wave is **post-hegemonic regionalism**, also called new regionalism. The new regionalism might be called a phenomenon which occurred in 80s of 20th century and which is here basically up to now. A typical feature of this wave of development is an important step towards the liberalization of international trade and the emergence of many regional integration groupings that were newly built or revived. This period is also known for creation of new kinds of agreements which greatly accelerated and simplified the liberalization of international trade. For this reason there is constantly growing volume of internationally traded goods and capital.

3.3. Regional integration

The process of international economic integration (also referred to as “regional integration”) is one aspect of international economy which importance has been growing for last six decades. Countries both within and beyond the context of regions within they are located are interested in economic integration. However, the trends which stimulate integration are much more intense at the regional level rather than on global. There are marked differences in the level of maturity between regions on the state of regional integration. These differences are derived from both political and economic reasons. Generally, economic integration is characterized as removal of all trade impediments between at least two participating countries and establishment of cooperation and coordination among these countries. Such a kind of economic integration is called bilateral as there are only two parties. Once there are more than two countries involved we call this cooperation multilateral. There are also initiatives, for instance World Trade Organization (WTO), operating on global level. Different forms and levels of economic integration has been described and also already implemented.[8]

A ***Preferential trade area*** (PTA) is the first level of economic integration. Within this area, integrated economies provide certain advantages. In particular, the reduction of tariff barriers however unilaterally which means that only the exporting country benefits. The European Union therefore has an agreement with the ACP countries (Africa, Caribbean, Pacific), which provide preferential import conditions to these countries in Europe but not the reverse. The link between PTA and the higher form of integration – ***The free trade area*** *(FTA)* – can be blurred as usually the main goal for PTA existence in

[8] JOHNSON, D., TURNER, C. *European Business*, p. 24-25

becoming a FTA in accordance with the General Agreement on Tariffs and Trade. Free trade area is an agreement based on mutual benefit. It is characterised by disappearance of tariffs within the zone. FTA has a precisely defined form and is clearly qualified by signatory countries. For the smooth functioning of the zone there are some jointly controlled institutions introduced in order to manage the zone to some extent, but mainly serves a factual report on the operation. Countries integrated in FTA determine its own trade policy; each country maintains its own customs with regard to third countries, but in this degree of integration nearly all tariffs and quantitative barriers (tariffs and quotas) are eliminated, but nevertheless certain non-tariff barriers (technical and quality requirements) remain. The problem is that some sectors may be excluded within such a zone causing that its proper functioning is not complete and effective. Now free trade area is mostly generated form of integration. As the internal tariff within the zone is equal to 0 but each country has its own duty related to third countries, the problem with penetrating the zone through the country with the lower importing tariffs might occur. For this reason rules of origin are introduced. These rules establish a minimum share of local content in the added value of the final good.

The next stage is a ***customs union*** which already requires that member states are represented outside by the common commercial policy, which means that they regulate together trade relations with non-members. It is a type of economic integration composed of FTA with a common external tariff, which then determines the export and import duties. Goods in this zone move freely and it is declared only once, which greatly facilitates intra-zone trade. *The* ***common market*** is a custom union to which is added the free movement of production factors. The objective is to create a market with free movement of goods, services, capital and labour. In this stage, very strong convergence of domestic economies occurs. There are first evidences of unification of monetary and fiscal policy since it is necessary to harmonize the national administrative policies. This integration is characterized by the requirement of maximum liberalization of trade between member states. In conditions of European Union the concept of "single of internal market" is applied. It was created in 1993 and unlike the common market; there still exist some barriers to free trade. Although all visible obstacles have been removed, the less significant but still very affecting the function of the free market persists. There are no more tariff barriers however other problem like technical obstacles, the difference in national norms and standards, differences in taxation and ongoing control of national borders of non-members of Schengen Area are still present.

If states choose to further deepen the integration among them the next stage of integration efforts is creation of ***economic union***. It is a type of trade bloc where exist common market plus common policies and the coordination of economic policies. Complete unification of monetary and fiscal policies of member countries is required. There is a complex process of transformation, which is usually implemented by a newly created central institution which is in charge of the whole union. This institution oversees operations in union and implements policies that are necessary to be applied in this level of integration. It should be remembered that the situation of superiority of transnational law over the national law arises. Decreasing sovereignty of member states raises the question.

3.3.1. Types of Regional integrations

For better understanding, the following division of regional integration by different criteria is introduced.

- Depth of regionalism
- Geographic regions
- Number of participants
- Character of members

Depth of regionalism reflects not only the achieved level of integration but also certain elements of the institutional structure. It also reflects the degree to which regional integration affects economic relations of its members. According to Baldwin[9], there are two types of regionalism: shallow and deep.

- *Shallow regionalism* means removal of barriers to the movement of economic factors on the borders of countries. In particular, the liberalization of external relations, which does not t directly intervene in internal economic environment in the state. Countries are trying to remove tariff barrier to trade. In terms of form the most common are FTAs and custom unions. As an example of a shallow regionalism may be mentioned North American Free Trade Agreement (NAFTA),

[9] Baldwin, Richard E. The Causes of Regionalism. London: Centre for Economic Policy Research, 1997. p. 867-869. Print.

Southern Common Market (Mercosur), or Association of Southeast Asian Nations (ASEAN)

- In the case of *deep regionalism,* competing firms from abroad can more easily penetrate market of domestic economy, thanks to the reduction of both quantitative and qualitative barriers to trade. There is highly centralized decision-making and it is left to one central authority that manages activities. Such an institution may change laws and decision-making is transferred to this supranational authority. Beside flows of goods, this integration covers also flows of services, capital and labour. The most known example of deep regional integration is the European Union.

Nowadays, the world can be divided into several **geographic regions** and we can observe the integration of different characters however the same depth, since each region sees regionalism in their own. In general, these regions have different attitudes for creating integrations. Today we talk about the five geographic regions - The *Euro-Mediterranean region* (Western Europe, Central Europe, Baltic countries and North Africa and Middle East), *Eastern Europe and Central Asia*, *Asia Pacific region* (Southeast Asia and Oceania), *Pan-American region* and *Sub-Saharan Africa*.

If we divide the regional trade agreements based on the criterion of **number of participants**, we distinguish agreements bilateral (between two parties) or multilateral (between more parties - three or more). Unfortunately, the currently situation is very difficult as a member of one regional integration can take a part in other regional integration. Then, the studies of such relations become very challenging. Today may arise following situations – bi-regionalism, multi-regionalism, inter-regionalism.

This division of regional integration based on the **character of participants** stands mainly on the fact that the world knows huge differences between developed and developing countries. For a long time, people have divided the world into rich North and the poor South. This division is based on this theory, which says that regional integration which might occur are: North-North, South-South and North-South.

3.4. The motives for regional integration

When searching for motives for regional integration it is necessary to proceed chronologically, because like regionalism develops the motives for regionalism develop as well. Moreover, it is clear that the motives for regional integration are largely influenced by geographical and political conditions that are difficult to generalize. However, the desire for economic prosperity and development is common to all nations, and the general motive for regional integration must lie in the economic field. Economic motives are not so much influenced by contemporary and local conditions and therefore can be applied to economic integration in general. It is considered that the main motive for economic integration is the effort to obtain safer access to larger markets.

In case of customs unions and free trade areas, the gains of being part of economic integration are:[10]

a) enhanced efficiency in production made possible by increased specialisation in accordance with the law of comparative advantage, due to the liberalised market of the participation nations;
b) increased production level due to better exploitation of economies of scale made possible by the increased size of the market;

Opening of markets increases the size of the market (market expansion). Companies benefiting from expanding market can produce more. This means that firms increase their production, the number of companies present on the expanding market must be lower than the sum of the companies present on each national market. Open markets can also demonstrate gains in the field of new technologies. Regional integration allows consolidation of research centres and therefore the pooling of resources. One integrated research centre is more effective than two isolated research centres. These effects of economies of scale result in a virtuous circle of economic growth. The increase in the size of markets and businesses leads to lower production costs by economies of scale. This improves price competitiveness which leads to an increase in exports. It has increased production; there is a new economy of scale that lowers costs. This dynamic continues as long as the companies have not reached their optimal size.

[10] EL-AGRAA, A. M. *Regional Integration: Experience, Theory and Measurement,* p. 4-6

c) an improved international bargaining position, made possible by the larger size, leading to better terms of trade (cheaper imports from outside world and higher prices for exports to them) ;
d) enforced changes in efficiency brought about by intensified competition between firms;

Regional integration increases the competitive pressure of companies that could benefit from a strong market power before formation of zone. Therefore there is questioning of dominant positions. This competition pushes companies to be efficient (lowering their costs) and innovative. A regional integration has a positive effect on the diffusion of technical progress. The expanding market causes implantation of subsidiaries of multinational firms from third countries to the area. These new implementations intensify competition in the area.

e) changes affecting both the amount and quality of the factors of production due to technological advances, themselves encouraged by (d)

If the level of economic integration goes beyond the free trade area and customs union, there are other possible gains for further economic development:

f) factor mobility across the borders of the member nations will materialise only if there is a net of economic incentive for them, thus leading to higher national incomes;
g) the coordination of monetary and fiscal policies may result in cost reduction since the pooling of efforts may enable the achievement of economies of scale; and
h) the unification of effort to achieve better employment levels, lower inflation rates, balanced trade, higher rates of economic growth and better income distribution may make it cheaper to attain these targets.

Entirely a new dimension regional economic integration gains in the early nineties, after the fall of the Iron Curtain and the transition of centrally planned economies to a market economy. This brings a significant change in the general motives for regionalism. This change is very strong political element, which can be due to the interconnectedness of the contemporary world generally regarded as valid. The following list of motives for integration can be considered as a mix of economic and political motives for regional integration[11]

a) government's effort to integrate their country into better grouping (in terms of politics or democracy) and thus support domestic and foreign investors;
b) an effort to gain more secure access to the market;
c) pressure of globalization on higher efficiency, increase in competitiveness and access to technology and investment;
d) the government's effort to gain more by sharing its sovereignty with other states in the areas of economy, where the influence of the national state is not sufficient. Getting stronger negotiating power in trade talks and in the context of disputes[12];
e) striving for stability and prosperity of neighbouring countries in order to help and prevent a spill-over effect of social tension and migration;
f) concern of the state to stay out of a strong group.

3.5. Static effects of economic integration

It is due to VINER Jacob and his book published in 1950 entitled The custom union issue, this theory is discussed in relation to free trade knowing that free trade is the optimal situation. In the context of Viner's theory, customs unions are analyzed with respect to free trade. It is within the framework of the theory of international trade. Since the customs union is an agreement that discriminates on the exchange, it may not necessarily be an optimal situation. Static effects of the customs union it is to compare a situation of general protection of the market (the country is protectionist regardless the origin of the country) to a situation of a customs union which by definition is a differentiated protectionism. The analysis is in terms of welfare. VINER shows that the formation of a customs union has two opposite consequences in terms of welfare. These are trade creation and trade diversion.[13]

[11] SCHIFF, Maurice W., WINTERS, L. Alan. *Regional Integration and Development,* p.20
[12] DIJK, Meine Pieter Van., SIDERI, V. *Multilateralism versus Regionalism: Trade Issues after the Uruguay Round,*.p.25
[13] HOSNY, Amr Sadek. *Theories of Economic Integration: A Survey of the Economic and Political Literature, p. 3*

There is **trade creation** when domestic production is replaced by imports from a union member whose production costs are lower. In the case of trade creation, There are improvements in well-being and thus benefit from the creation of the customs union.

There is **trade diversion** when imports from the rest of the world (outside the union) are replaced by those of a member of the customs union whose costs are higher. Before the formation of the customs union there have been imports from third countries. Union formation leads to free trade within the zone, however the duty to pay customs is still present for others and former imported goods become more expensive. Therefore there is disadvantage of formation of the union as less profitable and competitive production is preferred. The diversion of trade causes decrease in welfare.

It can be shown of the following example in table (4). There is country A which enters a customs union with country B or C. In both case, country A will gain from trade since the domestic price of commodity X in country A (36) is more elevated than in country B (25) or C (15). The direction of trade will be shifted from a high cost member country A to lower-cost member country B or C. This situation is example of trade creation.

Table 4 : Price of commodity X in three countries

	Country A	Country B	Country C
Price of comodity X	36	25	15

Source: own work

On the other hand, if country A levies a tariff of 100% on commodity X, then it would import only from country C which is low-cost producer in this case. However, if country A enters customs union with country B, it will result in imports of commodity X from country B which sells at price 25 compared to price after the duty in country C (30). This is an example of trade diversion as the trade direction is shifted from low-cost non-member country C to a high-cost member country B.

The result of formation of customs union depends on which one of two effects prevails. If the trade creation is more significant that trade diversion, there is positive impact on welfare. However, in situation when trade diversion in customs union is stronger than trade creation, the final consequence is negative in terms of welfare. The net effects of formation of a customs union depend on the conditions that prevailed before the formation of the union.

We can state a set of general requirements:

- the higher is initial level of tariffs, the higher the net effects are positive,
- the higher is the level of common external tariff, the more the customs union is favourable,
- the higher is the number of participants in the union, the higher it is profitable,
- the more structures of production and consumption are similar, the more is union favourable because there is trade creation,
- the more are countries initially integrated, the more is customs union favourable.

Concerning preconditions which are necessary to success of regional integration Viner says: *"Customs unions are not important, and are unlikely to yield more economic benefit than harm, unless they are between sizable countries which practice substantial protection of substantially similar industries"*[14]

In conclusion Viner supports multilateral solution of worldwide reduction of trade barriers and calls for non-discrimination: *"...customs union is only a partial, uncertain, and otherwise imperfect mean of doing what a world-wide non-discriminatory reduction of trade barriers can do more fully, more certainly, and equitably..."* [15]

3.6. European Economic and Monetary Union

Final stage of integration process is creation of complete economic and political union (EMU). It means that the member countries will be unified and become one state with common centre which has an authority to decide about both economic and political questions. One of the levels which precede this peak of integration efforts is economic and monetary union. In this phase, if we concentrate on the example of EU, the common market has been created and is fully functional, certain part of competencies are decided by supranational institutions. There is close coordination in areas such as trade and economic policy, also control of fiscal policies. In this case, the economic union is only partially developed. Common market ensuring the free movement of goods, services, persons and capital, together with the single currency and the single economic policy at supranational level would mean the completion of the economic union entirely. Monetary union

[14] VINER, Jacob. *The Customs Union Issue*, p.135
[15] VINER, Jacob. *The Customs Union Issue*, p.135

characterized by complete fixation of the currencies of member countries to each other at constant exchange rates. In the final stage of Monetary Union all national currencies will be unified into one common currency, which is the only legal one. Monetary policy is then implemented through a joint institution, a central bank. The central banks of the member states have transferred their sovereignty in matters of monetary policy at the central institution which is responsible for regulating the amount of money in the economy, setting interest rates, and the amount of foreign exchange reserves.

Example of incompletely developed economic and monetary union is the EU. The core of the European Union, consisting of 18 states, has adopted a common currency - euro. For monetary policy decision-making is responsible the European Central Bank (ECB). At the beginning of the building of economic and monetary union, in the 90’s of previous century, it has been unacceptable for former political leaders to centralise national fiscal policies in the hands of a supranational authority. It resulted in only partial development of EMU and its decentralized solution. It consists of a common monetary policy, but only close coordination of economic policies. Deciding on fiscal policy is the responsibility of sovereign nation governments. The Maastricht Treaty in the case of fiscal responsibility, which is one of the preconditions for a successful long-term functioning of the monetary union, says only this: "Member States should avoid excessive deficits".

3.7. Regional integrations in American Region

In the American region, which consists of North America, Latin America and the Caribbean islands, there are five major multilateral integration groupings and a large number of bilateral agreements. The conclusion of these agreements was particularly slowed down by late-onset of USA to co-operate in the region.

One of the strongest economic integration grouping in the Americas region is **North American Free Trade Agreement - NAFTA**, an agreement between the USA, Canada and Mexico, which was signed on 17 December 1992. This Agreement is partly derived from the agreement on free trade zone between Canada and the USA, which was signed already in 1988. NAFTA entered into force on 1 January 1994, and since then this grouping competes with other integrations in the world. It was competition what has forced these countries to create the "union", precisely in response to the forces of integration in Europe. This agreement established a common market in North America with the planned phasing out of tariffs between countries by 2010. NAFTA is today one of the largest free trade zones and strongly affects operation of the world economy and international trade. The agreement also includes an agreement on environmental cooperation and an agreement on labour market cooperation.[16]

Central American Common Market - CACM is another integration grouping that brings together several Latin American countries. It is a multilateral customs union which was established on 13 December 1960 at the conference in Managua and it was registered in 1961. Today, 7 countries take part of this integration (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama) and the associated partner Dominican Republic. In 1991, Tegucipalpa Protocol was signed and on its basis was established Central American Integration System - SICA[17], which became the new political-legal framework for all levels of integration in Central America, such as economic, social, cultural and environmental policy.

Caribbean Community and Common Market - CARICOM is multilateral integration (customs union and common market), which has 15 members (Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago) and 5 associate members[18]. This integration grouping was established by the Treaty of Chaguaramas, which was signed by Barbados, Jamaica, Guyana, Trinidad and Tobago and came into force on 1 august 1973. Then 8 other countries joined. The Bahamas became the 13th members of the group in June 1983, but did not become a member of the Common Market. In 1995, Suriname joined CARICOM and in 2002 also Haiti did so.[19]

Andean Community of Nations - ACN is shallow type of integration groupings, which however, has the ambition to deepen this integration if it is consistent with sustainable development. This integration today counts four countries - Bolivia, Colombia, Ecuador and Peru. Willingness to integrate in this part of America can be seen already mid of 20th century, which culminated in 1969 by signing of Cartagena Agreement, which led

[16] ORGANIZATION OF AMERICAN STATES. *SICE: Trade Agreements: North American Free Trade Agreement* [online]
[17] SICA. *SICA in Brief* [online]
[18] CARIBBEAN COMMUNITY SECRETARIAT. *Members and Associate Members*. [online].
[19] CARIBBEAN COMMUNITY SECRETARIAT. *History of the Carribean Community (CARICOM)* [online]

to the creation of Andean Pact, agreed by states Bolivia, Ecuador, Colombia, Chile and Peru. In 1973 Venezuela joined but in 1976 Chile left the community and in 2006 Venezuela left too. Since then member base of Andean Community is reduced to four member states. In 1997 Andean Pact was replaced by the Andean Community and since then they tries to deepen cooperation in non-economic sectors (social and political sphere, the environmental area, foreign relations, economy and trade and building common institutions) in order to adapt to the development on international scene.[20]

Mercado Común del Sur – MERCOSUR- Southern Common Market was created after the signing of the Treaty of Asunción in 1991 and the founding members are Brazil, Argentina, Paraguay and Uruguay. Mercosur followed up on collaboration which began in the 80 of 20th century between Argentina and Brazil. Candidate countries are Venezuela and Bolivia, which are indeed very attractive for integration, with large oil and gas reserves, but in Venezuela there are problems with violation of human rights and Bolivia is controlling Andean Community. These are clear arguments to reject their membership. It is interesting that members cannot decide by themselves with whom they would like to conclude bilateral free trade agreement which is not in favour of the United States. USA would prefer to conclude agreements with each separately[21]. Despite positive relations with the USA, the largest trading partner is still today European Union. Southern Common Market is the most successful economic integration and the largest economic bloc in the South American continent. It is a relatively successful integration grouping, which at the time of establishment give itself the objective of creating free trade area, customs union and subsequently common market. The European Union is a model for this association in many ways. MERCOSUR is a customs union since January 1995. Trade between members was liberalized and common tariff for third countries was established. The customs union, however, can be considered unfinished and imperfect, as some sectors are not yet entirely liberalized- duties have not been eliminated.[22]

[20] ANDEAN COMMUNITY. *Brief History* [online]
[21] LATINSKA AMERIKA DNES. *Mercosur: Společný trh Jihu* [online]
[22] EUROSKOP. *Mercosur* [online]

3.8. Regional integrations in Asian Pacific Region

The first grouping in the region which we characterize is the **Association of Southeast Asian Nations - ASEAN**. Integration was founded on 8 August 1967 in Bangkok, Thailand when founding countries - Indonesia, Malaysia, Republic of the Philippines, Singapore and Thailand - signed the ASEAN Declaration. The first enlargement took place in 1984 when Brunei joined. Vietnam joined ASEAN in 1995. Two years later accession Laos and Myanmar accessed. The last enlargement occurred in 1999 when the grouping was joined by Cambodia. Thus, the number of members is currently 10. Today's members are: Myanmar (Burma), Brunei, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Cambodia and Vietnam. Declaration from Bangkok (the ASEAN Declaration of) which is a constitutional document makes it clear that the reasons for the creation of this integration are purely economic, technological, social and cultural. Nevertheless for several member countries, membership in this cluster meant a need for political reorientation. In 1989, when **Asia-Pacific Economic Forum - APEC** was found, ASEAN has passed through crisis, since it was not clear which direction the association should take. This identity crisis was resolved by the creation of the ASEAN Regional Forum, which aimed to address the security relations and discuss various topics which the national political scene already discussed but the community as whole could not. It is clear that despite the significant decline in the importance of ASEAN which was registered after the establishment of APEC is its role in the world economy still considerable. ASEAN is still trying to strengthen its current position in the world trade for example thanks to ASEAN Free Trade Area - AFTA, but it is complicated by the fact that member states are very heterogeneous group. AFTA agreement was signed in 1992 in Singapore and the states that wanted to join the ASEAN integration after 1992 were required to sign the agreement. The thing that complicates the operation of this grouping is the fact that the development of the member states and their economic levels are very often fundamentally different. A common problem is also different political system, which prevents them from greater cooperation and convergence. Nevertheless, grouping is still trying to improve its competitiveness by eliminating tariff and non-tariff barriers to trade within the group and with non-member countries

Another example of a multilateral grouping in this region is the **South Asian Preferential Trade Agreement - SAPTA**, which is the predecessor of the more recent

South Asian Free Trade Agreement - SAFTA. Both of these groupings were formed for the liberalization of foreign relations and trade between these countries - Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. SAFTA was signed on 6 January 2004 in Islamabad, Pakistan and the aim of this regional integration became deepening of economic cooperation between the countries of the region and the creation of a free trade zone that should be in the future transformed into a customs union, a common market and eventually to an economic union. Trade liberalization in the cluster should be proceed slowly and do not have to be practiced by all members of the group just as fast. States should take into account economic situation in their countries and while reducing tariff and non-tariff barriers they should be cautious.[23] This economic integration is only a partial degree of cooperation that exists between the countries of the regional integration grouping South Asian Association for Regional Cooperation – SAARC.

3.9. Regional integrations in Sub-Saharan Africa

Regional integration which will be introduced now is one of the oldest in the world. It is **Southern African Customs Union - SACU**, whose first version was founded in 1889 when Customs Union Convention between the British colonies - the Cape of Good Hope and the Orange Free State was signed. The new agreement, which established on a basis of still existing SACU joined other states and dependent territories. In 1910 an agreement was signed between the Southern African Union and British administrative territories (Basutholand - Lesotho, Bechuanaland – Botswana and Swaziland). Southwest Africa, currently Namibia, was initially only *de facto* member, because it was one of the administrative units of South Africa, but over the years it became *de jure* member. The most important objective the SACU give to itself was to promote economic development through regional coordination of trade. This integration therefore kept in mind that if you want to improve the living standard of people you must take care, that state is economically developing. The pact signed in 1910 which was effective until 1969 establishing common external tariff, fond of collected duties and certain excise taxes. Furthermore, it was also established free movement of goods among states of the Customs Union. A fund where selected duties and excise duties were collected was established and resources were then distributed among the member countries. This income redistribution

[23] SAARC. *Agreement On South Asian Free Trade Area (SAFT*A) [online]

was uneven and some British dependent territories sought a revision of the treaty. This effort peaked after their liberation in 1960 and in 1969 a new agreement was signed by sovereign states Botswana, Lesotho, Swaziland and South Africa. In 1990, the grouping also joined newly liberated Namibia. The next revision of the agreement was then in 2002 when states finally get the same rules and conditions of membership which were granted only to South Africa before. This means that all have the same decision-making power, the same right on redistribution of income and the same influence on decisions on external relations of the Union.[24]

One of the youngest but also the best known regional integrations on African continent is called the **Common Market for Eastern and Southern Africa - COMESA**. The tendency towards establishment of a regional grouping in this region have been present since the 60s of 20th century when many countries gained independence and freedom. Based on relatively good mood that prevailed in the region, United Nations Economic Commission recommended the creation of integration, however with caution. States therefore first established sub-regional preferential trade area in 1982. Main goal was to exploit potential of larger market which should help to greater economic and social cooperation between the members. The ultimate goal of PTA was to create an economic community that was ready to move to higher level of integration - common market. It was established on 5 November 1993 by agreement on the establishment of COMESA. Today it is group of 19 countries. It is very important for COMESA to ensure that members are equal and interdependent in order to support cohesion. In addition, members shall strive to maintain peace in the region and deepening democratization of legal systems.[25] All internal trade barriers within the cluster were removed and external tariffs were unified. In the further cooperation members will also enhance liberalization of trade and customs cooperation. States will also attempt to improve the infrastructure to facilitate free movement of goods and people. Finally, states harmonize macroeconomic and monetary policies in the region. All these objectives are preconditions for the creation of a strong and unified grouping that could become one of the pillars of future African Economic Community (AEC), which is one of the plans for creation of pan-African integration.[26]

[24] SACU. *About SACU: History of SACU* [online]
[25] COMESA. *About Us: History of COMESA* [online]
[26] AFRICA UNION. *COMESA's Priorities and Objectives* [online]

3.10. Optimum currency areas

Main reason, objective and content of the theory of optimum currency area is to answer the question whether the elimination of the national currency and monetary instruments used by countries to influence the economy may be replaced by a sufficiently effective economic mechanism of a single currency. The main cost resulting from monetary integration is considered to be the possibility that the country will be hit by an **asymmetric shock.** Any economic imbalance in the form of an asymmetric shock may originate on the supply side or demand side. Their common feature is that they do not cover the whole currency area, but only individual countries or regions and they may occur at different times and have different intensity and duration.

A demand shock may occur, for example, when there is a shift in demand for products among members of the monetary union, for instance from Italian products to the products originating from Germany, France, etc. However, once there is a decline in production in all countries of the monetary union that would be a symmetric shock affecting all countries.

A supply shock may occur for example during long-term and significant decline in world prices of the products that the country which represents large share of the total production of the country and the country's exports. Negative impact on that country is then more significant than on countries whose production and exports are more diversified.

In terms of the theory of optimum currency areas, as an optimum currency area can be considered such a geographic area or a monetary union where the probability of asymmetric shocks is very low and where exist economic mechanism that is able to prevent asymmetric shocks or in case of their occurrence such a mechanism is able to eliminate the shock or at least reduce its impact.

According Krugman and Obstfeld[27] optimum currency areas are defined as: *“groups of regions with economies closely linked by trade in goods and services and by factor mobility”.*

[27] KRUGMAN, Paul R., OBSTFELD, Maurice. *International Economics: Theory and Policy,* p.625

3.10.1. Theory of optimum currency areas[28]

The genesis of the theory of optimum currency can be found in the sixties of the previous century when American professor Robert A. Mundell published in 1961 an article entitled "A Theory of Optimum Currency Areas". He concluded that the loss of the ability to influence economic processes by change in exchange rates may be replaced by a high flexibility and mobility of labour and capital.

Mundell's original work was followed by number of economists; the first was Ronald I. McKinnon, who in 1963 published an article entitled "Optimum Currency Areas". He extended Mundell's theory and point out that it is necessary to take into account the impact of factor of an open economy which is defined as the ratio between tradable and non-tradable goods relative to domestic production.

The third American economist in 60s was Peter B. Kenen, who followed the previous authors by the article in 1969 entitled "The theory of optimum currency areas: an Eclectic view". Kenen extended the theory to the criterion of production structure, concluding that countries with a high degree of production diversification can become suitable candidates for membership in the monetary union, even with low labour mobility between member countries, as envisaged by Mundell.

Based on the theory of optimum currency area can be concluded that those countries or regions of monetary union which do not have sufficient flexibility of economic structures or they do not form with the other countries of the monetary union sufficiently homogeneous economic area, are more likely exposed to negative impact of asymmetric shocks. The homogeneity of the economic environment across the currency area is determined by a number of factors working simultaneously. The theory of optimum currency areas is based primarily on flexibility of production factors - labour and capital, goods market flexibility, integration of capital markets and fiscal policies that are considered to be mechanisms capable to absorb asymmetric shocks; along with a policy that affects these adjustment mechanisms and supports them. Necessity of policies supporting the elimination of asymmetric shocks is based on the fact that there is no guarantee that improving of the functioning of the monetary union will take place automatically.

[28] BRŮŽEK, A., SMRČKOVÁ, G., ZÁKLASNÍK, M. *Evropská Měnová Integrace a Česká Republika*, p.27-32

An integral part of the optimum currency area is the **mobility of labour**, which may vary depending on the economic and political development in the area. When there are fixed wages and prices, labour mobility may be a factor eliminating asymmetric shocks. If the surplus of labour (unemployment)in one country moves to another country. The first country would reduce unemployment while maintaining the same level of wages, while in labour-importing country would be solved the problem of labour scarcity, while also maintaining the existing level of wages. Labour force mobility in this case is substitute to changes in exchange rate while eliminating asymmetric shock. If there is a possibility to change the exchange rate, the depreciation of national currency can increase competitiveness which would result in the growth of domestic production and reduce unemployment.[29]

However, the problem lies in the fact if the workforce is able to move from one country to another in a sufficient speed and amount in order to eliminate asymmetric shock. Compared to changes in the exchange rate, labour force mobility is undoubtedly slower. The barrier for potential movement of people are also other factors, such as differences in work habits, language skills, change in life style and departure from the family, etc. In contrast, increase in mobility of the workforce may be achieved by deliberate policy aimed at increasing the qualification and retraining.

Mobility of labour is closely related to assumption of **flexibility of wages and prices**, the fast adaptation to changes taking place in the labour market and goods market is also problematic, especially downwards and in a short period. This in turn can jeopardize the competitiveness of domestic firms at sector and regional level. Low or zero wage flexibility is compensated by a reduction in the number of employees in the company.

Monetary instruments in monetary union could be replaced by a fully opened labour market with highly geographically mobile labour force, accompanied by flexible wages, prices and growing labour productivity. Mobility of labour and flexibility of wages and prices are unquestionably significant adaptation mechanisms which help to absorb asymmetric shocks, however their effect contributes to reduce the impact of asymmetric shocks rather than to their elimination. Reduction of the possibility of occurrence of asymmetric shock can be achieved by lowering the differences in the volatility of

[29] KRUGMAN, Paul R., OBSTFELD, Maurice. *International Economics: Theory and Policy*,.p.626-627

individual economies. Currency area will then be less susceptible to negative developments in the world economy such as the financial crisis.

Risk of creation and development of asymmetric shocks is the smaller the higher is the achieved **degree of regional economic integration**. The closer level of economic integration mainly the level of mutual production and trade integration measured by the share of exports and imports of mutual trade to GDP, a measure of intra-industry trade and interconnection of capital flows mainly through foreign direct investment and closer integration of financial markets.

An integral part of the regional economic integration is also **diversification of the production structure and exports** of member states of currency area, which may also in large extent help to prevent asymmetric shock. The high degree of diversification of the production structure of GDP and exports leading towards homogenization with other countries significantly reduces the potential impact of asymmetric shocks, because it affects only one sub-segment of the economy, while others are unaffected and they can compensate its effects. If the shock of that segment of the economy occurs in other countries of the monetary union, it would become symmetric shock.

The high degree of diversification and homogenization of production and export structure contributes to the **synchronization of economic cycles** in countries of monetary union and it reduces the risk of asymmetric shocks. However, a higher degree of integration does not totally reduce the risk of asymmetric shocks, if in some countries there is a specialization of production instead of diversification of production and mutual trade.

Different economic cycles of member countries are a potential source of asymmetric shocks, because a single monetary policy can cause shock if for example applied a high interest rate for a country that is in recession. Practically the same applies also to the different rates of inflation, the rate of economic growth, unemployment, etc.

Among the factors which form a homogeneous economic area, apart from the mobility of labour is **capital mobility**. Precondition of capital mobility is that the surplus of capital in various forms will move into areas that are not sufficiently capitalized. This should reduce the divergence mainly in economic level and employment and lead to more balanced economic and social development of the entire monetary union.

The integration of financial markets is another way to stave off the impact of asymmetric shocks and to contribute to economic growth. Before the introduction of the common currency, financial markets have mostly national character involving financial instruments such as stocks and government bonds denominated in national currencies. The introduction of a common currency enables these isolated financial markets transform to the financial markets integrated at different levels and structures.

This leads to the emergence of:

- the fully integrated interbank money market;
- highly integrated bond market in the common currency, enabling the selection from a wide range of sources of financing and investment;
- single stock market in currency area in a common currency;
- increasing number of internal and cross-border mergers between banks in monetary union.

An integrated financial market of monetary union creates better conditions when deciding whether to invest or to save, because there is a much wider range of possibilities compared to national financial markets. Businesses have the opportunity to acquire funds to finance their activities from large integrated capital market, while also protecting against possible financial risks using a wide range of new and better financial instruments available. An integrated financial market then allows better financing of economic growth, while also creating new job opportunities.

Asymmetric shocks can be dependent on the **degree of openness of the country**[30] (the economy) measured by the share of exports and imports to GDP. Risk of external asymmetric shocks (e.g. stagnation of the world economy) is larger for countries that are more open. While at the same or similar degree of openness, the impact of an external shock to members of monetary union is symmetrical; their impact on the country less open is smaller and therefore asymmetric. The symmetry of the impact of external economic shocks is reached if countries have similar geographic orientation of foreign trade.

3.10.2. Necessary conditions for the functioning of monetary union

Monetary stability achieved by meeting the nominal convergence criteria including a high degree of price stability, expressed by the same or close inflation rate of the participating countries, their stable long-term interest rates, stable exchange rates and "healthy" public finances is a prerequisite not only for the creation of a monetary union,

[30] BALDWIN, Richard E., WYPLOSZ, Charles. *The Economics of European Integration,* p376

but also the necessary condition for steady development and economic growth of the monetary union.

The **real convergence criteria**, understood primarily as reducing disparities in the economic level, employment and living conditions in member countries are factors influencing the effects of asymmetric shocks in the long term, not only in positive but also in negative sense leading to their divergence.

A very important part of the economic mechanism of optimum currency area is **fiscal policy and its coordination.** The common budget with financial resources at union level which is applicable to the reduction or elimination of asymmetric shocks. The solution is based on the amount of financial resources and strength of asymmetric shocks, amount of financial support in the region or country affected by the recession and unemployment.

Undisputed place in a given economic mechanism have further applied policies of horizontal and vertical character, such as pricing policies, customs, social policy, investment policy, science policy, trade policy, licensing policy, etc., as well as agricultural policy, transport policy, regional policy, environmental policy, etc.

In conclusion, it should be noted that a prerequisite for all the above mentioned theoretical postulates of the theory of optimum currency area is the **political will of participating entities.** They should support approaches leading to convergence more than divergence approaches.[31]

3.10.3. Nominal convergence criteria

The eligibility of candidates to join the European Monetary Union is assessed on a basis of the convergence criteria. The purpose of these criteria is to maintain the monetary stability and prevent the entry of the country, which would distort the monetary stability by non-fulfilment of given conditions.

Nominal convergence criteria laid down in Treaty of Maastricht are as follows:[32]

1. The average inflation rate of the country in the period of one year before the entry must not exceed by more than 1.5% average inflation rate of the three countries with the lowest inflation rate.

[31] CIHELKOVÁ, E., JAKŠ, J. *Evropská Integrace - Evropská Unie,* p.180-184
[32] ECB. *Convergence criteria* [online]

2. Long-term nominal interest rate cannot exceed in the year before joining the EMU average interest rate of the three countries with the lowest interest rate by more than 2%.
3. The public finance deficit should not exceed 3% of GDP.
4. Public debt should not exceed 60% of the country's GDP at the time of EMU entry check, unless a country can prove that this ratio is constantly decreasing the reference value or the excess is exceptional and temporary.
5. The exchange rate of member country shall not exceed range of the European Exchange Rate Mechanism (ERM) system and at least two years before joining the EMU central bank can not devalue its currency against the currencies of EU member states.

3.11. Varieties of Crises[33]

When analysing what crises is we can start with the definition of the word itself. A word crisis comes from Greek *krisis* meaning decision. We can derive that crises is a period when some decision must be done and we can easily understand that the decision is not easy. In economy we talk about economic crises and there are several reasons why such a crises occurs.

First type of crisis is **inflation crisis** which is characterized by its universality and long historical significance. It is relatively simple and clear to identify such a crisis. Inflation (continuous increase in the general price level of goods and services in an economy over a period of time) in period 1914 – 2006 was in average 5.0 percent. Problematic are an annual inflation rates reaching 20 percent or higher. As critical is considered a situation of hyperinflation when inflation rates reach 40 percent per month or higher. It negatively affects exposed economy and can lead to abandonment of country's currency. As an example we can name Germany in the period after World War I during Weimar Republic. Between 1921 and 1924 country went through serious inflation crisis. On its peak prices doubled every second day and inflation rate reached the value of hundreds and thousands percents.

Currency crash is another reason why economic crises occur. Currency crash is annual depreciation of country's currency versus U.S. dollar or the other relevant currency

[33] REINHART, C. M., ROGOFF, K. S. *This Time Is Different: Eight Centuries of Financial Folly*, p.4-14

of 15 percent or more. It is not surprising that currency crashes mirroring inflation episodes and the largest crashes showing the same timing as inflation crises. The “honor” of the record currency crash goes to Greece in 1944.

As an example from history, reason for economic crisis was also **currency debasement.** During the long era of human history the principal means of exchange were metallic cons. Debasements usually occurred and were particularly frequent in time of war. It is connected with important reductions in the silver content of the currency. Currency debasement is a reduction in the metallic content of coins of 5 percent or more. Currently we talk about currency reforms or conversions. The most extreme conversion in history is the recent Zimbabwe where currency was converted at a rate of ten billion to one.

Another reason for crisis is **bursting of asset price bubbles**. It concerns prices of equity or real estate). Such bubbles are also commonplace in the run-up to banking crises.

Banking crises and banking problems usually not arise from liability side but from a lengthy deterioration in asset quality which has its origin in collapse in real estate prices or in frequent bankruptcies in the nonfinancial sector. The onset of the crisis is marked by non-performing loans. Banking crisis is marked by two types of events. It is bank run which is very severe and financial stress. Bank runs leads to high withdrawals of cash by bank clients and consequences are the closure of bank, merging or takeover by the public sector. Financial stress is not accompanied by runs or merger, but stress of a string of similar consequences for other financial institutions.

External debt crisis is defined as: *“the failure of government to meet a principal or interest payments in the due date (or within the specified grace period). These episodes include instances in which rescheduled debt is ultimately extinguished in terms less favourable that the original obligation.”*[34] The biggest problem is that these defaults shut a country out of international capital markets and other loans are impossible. Example of external debt crisis is Greece in 1826 and 2008. First mentioned crises closed international capital markets for this country for 53 consecutive years.

Domestic debt crisis follows the definition of the external but in addition domestic debt crisis have involved the freezing of bank deposits and forced conversion of such deposits from foreign currency to local currency.

[34] REINHART, C. M., ROGOFF, K. S. *This Time Is Different: Eight Centuries of Financial Folly*, p.11

3.11.1. World and European crisis

The origin of most of the economic crises can be traced in the prosperous period when ignoring the facts warning signals may suddenly swing into prolonged stagnation or recession. The world financial crisis originated in the U.S. and in Europe it showed up in the fall of 2008 was certainly not unpredictable, but there were efforts of governments for the longest possible extension of the period to its full outbreak. This has subsequently contributed to the depth and strength how it spread worldwide. Europe by its previous fiscal irresponsibility helped the crisis to continue. Many wrong tendencies and bad decisions without elaborate consequences at the time of prosperity resulted in a deep recession, the deepest economic crisis since the thirties of the 20th century. The cause was thus not only very loose U.S. monetary policy, but also long-term increase in global imbalances and lack of effectiveness of control mechanisms in general. It has allowed financial institutions to provide their services without adhering to the principle of prudence as well as their clients who overestimated their ability to meet all obligations in the future. Finally, ignorance of credit risk by big investment banks and their global interdependence enabled the spread of "disease" across wide spectrum of economic sectors around the world.[35]

Speed of spreading and depth of the crisis is mainly attributed to the lack of regulatory settings and control rules of financial institutions, which was trigger by the policy of low U.S. interest rates along with support for mortgages with sub-prime (understand non-standard) rates in order to boost the domestic economy and the real estate market. An important role played also the development on derivatives market where the excessive secularization, shifting the credit risk to other third parties and all under the supervision of rating agencies which have overlooked for a long time the existence of these "toxic" assets. It was investment banks in U.S. who first appeared in existential problems in 2008, in particular Lehman Brothers, which provoked panic in the stock markets that quickly spilled over to Europe and caused liquidity problems to several banking houses. There was obvious need to quickly support the credibility of the entire European system, so access to bank loans was facilitated when ECB dramatically reduced interest rate. Governments have implemented anti-crisis measures and sought to increase the confidence of markets by introducing fiscal incentives. These measures were certainly necessary and

[35] SINGER, M.: *Co znamená řecká krize pro eurozónu a pro nás*, p.1

perhaps even correct, but when we realize situation of public finances of great part of European countries, jump increase in government spending and budget deficits necessarily lead to other problems - the global financial crisis spilled over into the debt trap.[36]

With the gradually deteriorating financial position of national governments and increasing deficits which served to rescuing of banking sector there is of course increase in expected return of government bonds and thus increase in the costs of government borrowing. Primarily, Ireland was forced to spend substantial amounts to bail out its banks and basically would have gone bankrupt, although previously it was called the "Celtic tiger". Evidently there was need for a coordinated approach and efforts to stabilize the euro area financial system which led to the adoption of other measures. Government guarantees on interbank loans were provided, deposit insurance, bank recapitalization was promised for banks in trouble, as well as support in case of toxic assets. This common effort of European institutions and governments, who are obliged to intervene if necessary, raised public confidence in the banking system and it has also reflected in the rating of agencies. However costs were high, the amount is close to EUR 500 billion which represented approximately 7% of euro area GDP.

Government made an effort to stimulate economic activity and consumption along with an effort to prevent further declines in GDP. These measures were directed primarily towards citizens and their costs, thus trying to prevent a decline in income part of public budgets, caused by decrease of excise duty collected and also trying to support key economic segments. The decline in production and the subsequent layoffs would in fact result in an increase in mandatory expenditures of the state in form of social benefits and unemployment benefits. However, most of these measures have not been properly thought through but rather “something” was quickly approved and so their effects are highly questionable. As an example can be used “scrappage program”, which helped to clear the roads and possibly supported large automobile concerns, however lead to further indebtedness of households, thus limiting their spending in other areas. As well as support of collapsing national and large companies often only lead to delay of bankruptcy and, therefore it did not prevent the increase in regional unemployment because many of them had already faced long-term problems. Paradoxically, Europe was hit by the crisis more than the original epicentre in the United States. One reason is the strong social system in

[36] MUSÍLEK, P. *Příčiny globální ekonomické krize a selhání regulace*, p. 6-20.

Europe, the U.S. government spending at a time of mass unemployment does not reach such proportions as in Germany or the whole EU. Another factor is the earlier mentioned OCA theory and criticized inflexibility of the European labour market and the strong position of trade unions compared to the USA.

3.11.2. PIIGS

In 2009, the inevitable became reality and most euro area countries exceeded the 3% budget criterion, perhaps with the exception of Finland. However, much worse became a sharp rise in long overlooked public debt deficit to GDP criterion, which was "successfully" ignored by most countries. A group of five countries with high government debt exceeding 60% of GDP set by the Maastricht Treaty showed up. They were called PIIGS (Portugal, Ireland, Italy, Greece and Spain) and the abbreviation certainly speaks for itself. Their indiscipline, which has so far been tolerated by financial markets suddenly showed up and fully exposed all hidden problems. Ireland (-14%), Spain (-11%) and Greece (-13.5%) have recorded double-digit deficits, mainly due to a decline in their GDP. Plus, the European community suffered by deleveraging of banks when liabilities were transferred from the private to the public sector; and the costs of fiscal stimulus policies in 2009. The result was that euro area public debt jumped from 69% to 79%. Well, almost eighty percent which is negatively perceived not only by credit rating agencies. Subsequent increase in credit risk and required government bond yield given by the risk premium, made refinancing of existing debt of individual countries more expensive and greatly limited their further increase. If we add rating downgrade in case of the most affected members we come gradually into a debt trap. The main value of the current economy is information and its processing, its bias, ignoring, exaggeration, concealment and especially the submission of false information.

4. Method used

4.1. Cluster analysis

Cluster analysis is a multidimensional statistical method that is used for classification of objects. It is used to sort the units into groups (clusters), so that the units belonging to the same group are more similar than objects of different groups. Cluster analysis can be carried out both on a set of objects, each of which shall be described by the same set of characters, or on the set of characters that are characterized by means of a set of objects, the holders of these characters.

The term cluster analysis encompasses a variety of methods and approaches aimed at finding groups of similar objects. Application of cluster analysis leads to good results especially in cases where set of objects actually breaks into classes, i.e., objects tend to be grouped into natural clusters. Basically we just have to find a suitable interpretation of the described decomposition, i.e., to characterize the resulting class.

There are different ways to aggregate objects based on their distance or similarity. The basic methods include:

a) **single linkage , nearest neighbour** - distance between clusters is determined by the distance between two nearest objects from different clusters . When using this method objects are drawn to each other resulting in long chains.

b) **complete linkage , furthest neighbour** - distance of clusters is determined on the contrary, distance between two outermost objects from different clusters. It works especially well if the objects naturally form separate clusters, it not applicable if there is a tendency for chaining .

c) **centroid-based clustering** - distance between clusters is determined by the distance between their centres (hypothetical unit with average values of characters). It takes into account the cluster size and fit if we expect their diversity. It requires expression of distance by squared Euclidean distance of objects.

d) **pair-group average** – distance between clusters is determined as the average distance of all pairs of objects from different clusters .

e) **ward's method** – it is based on analysis of variance. It selects such clusters to merge where minimum sum of squares is. Generally one can say that this method is very effective, but tends to form relatively small groups. It requires expression of distance by squared Euclidean distances of objects.

f) **k-means clustering -** tends to find clusters of comparable spatial extent, while the expectation-maximization mechanism allows clusters to have different shapes.

Objects intended for classification are subjects or phenomena. Each specific object is described by characters. Characters might be:

1. Qualitative characteristics
   - The final set of descriptive terms to which can be assigned numerical codes. We distinguish nominal, such as colour (1 - red, 2 - white, 3 - yellow), and ordinal that can be put into order, for example, shade of green leaves (1 – light, 2 – medium dark, 3 - dark).
   - Binary (dichotomous) characters, such as having blue eyes (true / false) or gender (male / female).
2. Quantitative characters
   - Interval in integers, e.g., length, temperature.

Values of individual characters of objects are often in different units. This may cause that certain characters appear as dominant and other characters as having little impact on the course of clustering. Sometimes it is therefore preferred to adjust the data so that all characters are commensurable. One of the ways of achieving this is data standardization. The starting point may be a transformation of variables. The adverse effect of units of measurement will be removed so that all values of j-th variable are divided by balancing factor, which can be for example arithmetic mean or standard deviation.

5. Analytical part

The main objective of the analytical part of this diploma thesis becomes answer to the question whether it was possible to predict the current development in the European Union. In other words if it was possible to predict, based on statistical data and knowledge of the theory of economic integration, a different course of the crisis in the EU member states. From the course of previously described economic crisis that began in 2008 it is clear, that EU Member States face different problems. A state which suffered the most during and after the crisis was Greece, where a sudden economic crisis undermined the long time neglected high national debt and transformed into a deep debt crisis, whence Greece is looking way out until today. Was it possible to predict such development, not only in Greece but also in other countries suffering the crisis? Is the European Union a single entity of economically inclusive states? Or there is some degree of difference in individual economies, which causes, that in case of negative economic trend a group of states is facing negative economic shock, while others are not?

In order to answer these questions two methods will be used. In the previous chapter the theory of optimum currency areas was extensively described. The existence of an optimum currency area is prerequisite for well-functioning monetary union. The European Union, at least in part, is also monetary union and other members (with rare exceptions) committed by their membership in the EU that they will participate on the project of monetary union in the future. This is the reason why we should find an answer to question whether the European Union is optimum currency area, whether it meets the requirements which have been described by theorists from the sixties of the 20th century. The common currency is often blamed for the depth of the crisis in Europe. Inabilities to create own monetary policy seemed to be a major problem for some euro area countries. Is the European Union optimum currency area? In the first part of the analysis we will focus on answering this question.

Cluster analysis will be used in order to identify if the European Union is a single economic entity, where all countries have similar economic characteristics, or contrary, and there are groups of countries differing from others and creating clusters. If there are clusters with different economic characteristics, does it tell us that countries which were affected by crises significantly create a common cluster? In that case, real convergence in the European Union was not achieved.

5.1. Is the EMU optimum currency area?

In this part OCA criteria, mentioned in the theoretical part of the thesis, are applied on current EMU. Seven EMU members have been selected – Germany, Ireland, Greece, Spain, France, Italy, Austria and Finland. The selection of countries is not random. These countries are members of the EMU since its foundation, i.e. since 1999. At the same time those are not post-communist countries, where some effects may significantly affect and distort the data. A comparative analysis is made on the basis of statistical data of selected countries and the euro area average. The aim of this section is to assess whether EMU meets the OCA criteria.

5.1.1. Labour mobility

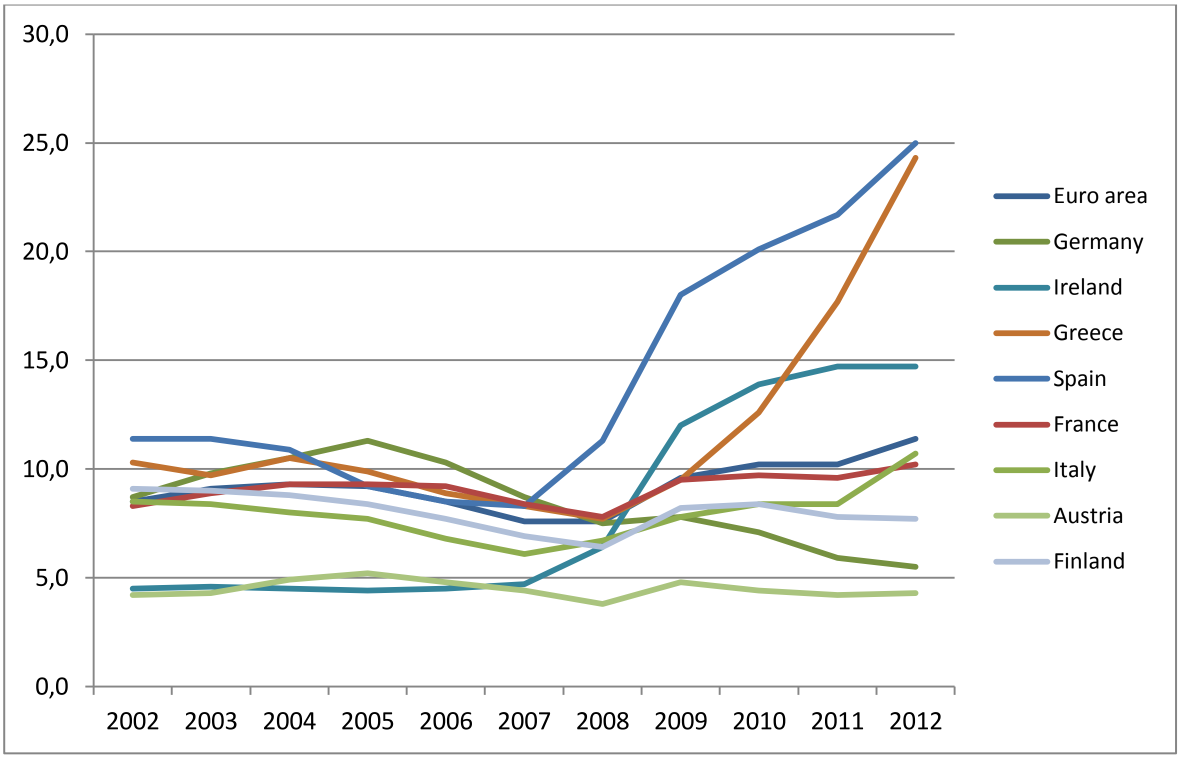
Mundell's model implies that if the labour is sufficiently mobile, there will be consolidation of unemployment rates of individual countries by shifting factors of production from the countries where there is relative surplus of labour and insufficient demand to countries where there is relatively scarce of work and high demand for it. Table 5 shows the unemployment rates of selected countries in 2002 - 2012. Chart 2 is based on this table.

Table 5 : Unemployment rate in selected coutries (%)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Avg.
Euro area	8,5	9,1	9,3	9,2	8,5	7,6	7,6	9,6	10,2	10,2	11,4	**9,2**
Germany	8,7	9,8	10,5	11,3	10,3	8,7	7,5	7,8	7,1	5,9	5,5	**8,5**
Ireland	4,5	4,6	4,5	4,4	4,5	4,7	6,4	12,0	13,9	14,7	14,7	**8,1**
Greece	10,3	9,7	10,5	9,9	8,9	8,3	7,7	9,5	12,6	17,7	24,3	**11,8**
Spain	11,4	11,4	10,9	9,2	8,5	8,3	11,3	18,0	20,1	21,7	25,0	**14,2**
France	8,3	8,9	9,3	9,3	9,2	8,4	7,8	9,5	9,7	9,6	10,2	**9,1**
Italy	8,5	8,4	8,0	7,7	6,8	6,1	6,7	7,8	8,4	8,4	10,7	**8,0**
Austria	4,2	4,3	4,9	5,2	4,8	4,4	3,8	4,8	4,4	4,2	4,3	**4,5**
Finland	9,1	9,0	8,8	8,4	7,7	6,9	6,4	8,2	8,4	7,8	7,7	**8,0**

Source: Eurostat, own work

Chart 2 : Unemployment rate in selected coutries (%)



Source: Eurostat, own work

As the chart shows, the unemployment rate in each country varies considerably. The wide span is evident in all monitored years, for example in 2002 Austria's and Ireland's unemployment rate was of 4.2%, resp. 4.5%, while Spain and Greece had 11.4% respectively. 10.3% unemployed. Difference between Austria and Spain in this year reaches more than 7 percentage points. EMU countries did not respond similarly during the global economic crisis when the unemployment rate in some countries is declining (Germany) or stagnating (Finland, Austria), while the others rise sharply (Greece, Spain, Italy).

Labour mobility within the EMU clearly failed to fulfil its role as a stabilizing mechanism for countries when being hit by external shocks. **EMU, in terms of labour mobility, does not constitute an optimum currency area.**

5.1.2. The degree of economic openness

Degree of openness of the economy was defined by McKinnon as the share of tradable goods in total consumption, respectively production. For the purpose of this paper the openness of economy is defined as the percentage of economic activity that is devoted to international trade. The share of exports in GDP measures the extent of domestic production that is traded abroad. The share of import in GDP indicates the extent of domestic expenditure attributable to imports. Table 6 shows the average of these shares to GDP in euro area countries in 2004 - 2012. The higher this ratio, the more open a country is to international trade.

Table 6 : Economic openness in selected coutries (%)

	2004	2005	2006	2007	2008	2009	2010	2011	2012
Belgium	73,45	76,7	78,9	80,6	84	72,35	78,75	84,6	85,55
Germany	36	38,7	42,7	43,7	45,05	40	44,8	48	48,85
Estonia	76,6	80,95	77,8	71,7	73,05	61,1	75,75	88,65	90,45
Ireland	76,05	75,5	74,4	75,9	78,8	82,2	90,5	91,9	95,7
Greece	27,4	27,85	28,9	30,85	31,35	25	26,85	29,1	29,5
Spain	27,9	28,3	29,5	30,25	29,4	24,85	28,45	31,35	32,3
France	25,9	26,7	27,55	27,65	28	24,3	26,65	28,4	28,55
Italy	24,85	25,9	28	29	28,9	24	27,55	29,5	29,65
Cyprus	49,55	49,9	49,95	51,35	51,4	43,65	45,1	45,45	44,4
Latvia	51,85	55,4	55,85	52,55	49,95	44,65	54,25	61,2	63,55
Malta	77,45	76,5	91,15	92,8	92,7	82,95	92,15	96,75	99,55
Netherlands	62,7	65,35	68,95	70,1	72,15	65,1	74,65	79,6	83,8
Austria	49,6	51,85	53,85	56,05	56,4	47,85	52,2	55,8	55,6
Portugal	32,2	32,4	35,25	36,2	37,45	31,7	35,15	37,9	39
Slovenia	58,45	62,4	66,8	70,35	69,15	58,3	66,05	72,25	73,7
Slovakia	75,9	78,6	86,5	87,45	84,7	70,85	80,5	89,25	94
Finland	36,6	39,75	43,15	43,25	44,95	36,5	39,7	41,35	41,1

Source: Eurostat, own work

The values in the table clearly demonstrate the fact that all selected countries are opened to foreign trade. The smaller is a country, the more open to foreign trade. This is due to the inability of smaller economies to meet domestic demand by their own production and necessity to import strategic raw materials from abroad. Smaller countries like Belgium, Estonia, Ireland, Latvia reaches the share of foreign trade to GDP of 50% and more. The big economies usually have values around 30%, which does not imply a smaller trade links with other countries, but large domestic market capable to saturate domestic demand and lower dependence on imports of strategic raw materials due to their own resources. The impact of economic crisis can be observed on numbers referring to the openness of European economies. In 2008 – 2009, activity associated with foreign trade generally decreased. **EMU, in terms of openness to foreign trade, constitute an optimum currency area.**

5.1.3. Production diversification

If countries entering the monetary union have similar economic structure and diversified production, the existence of asymmetric shocks is less probable. Table 7 shows the share of different sectors in the GDP of selected EMU countries in 2000 and 2010. The economy, based on the classification of the European Union, is divided into six sectors – Agriculture, Industry, Construction, Trade-Transport-Communication services, Financial services and Other services. The more equal is the share of particular sectors to GDP of country, the better the economy is diversified and better the country meets this criterion.

Table 7 : Production diversification in selected countries (% of GDP)

	Agriculture		Industry		Construction	
	2000	**2010**	**2000**	**2010**	**2000**	**2010**
Germany	1,3	0,9	25,3	23,8	5,2	4,1
Ireland	3,1	0,9	33,9	25,3	7,4	5,4
Greece	6,6	3,4	13,9	14,4	7,0	4,2
Spain	4,4	2,7	20,9	15,9	8,4	10,2
France	2,8	1,7	17,8	12,6	5,2	6,6
Italy	2,8	1,9	23,3	19,3	5,0	6,0
Austria	2,0	1,5	23,2	22,2	7,4	6,9
Finland	3,5	2,9	28,4	22,5	6,2	6,7
Avg.	**3,3**	**2,0**	**23,3**	**19,5**	**6,5**	**6,3**
	Trade, Transport, Communication services		**Financial services**		**Other services**	
	2000	**2010**	**2000**	**2010**	**2000**	**2010**
Germany	18,3	17,2	27,7	30,5	23,0	23,6
Ireland	17,8	16,5	21,1	26,2	15,6	21,9
Greece	30,1	34,6	20,6	21,3	21,7	26,1
Spain	26,2	25,7	19,5	23,2	20,8	23,9
France	18,9	19,3	30,7	34,2	24,8	27,1
Italy	23,8	22,1	24,6	28,3	20,0	22,2
Austria	24,4	23,2	21,4	24,0	21,0	21,8
Finland	20,2	20,0	20,9	24,3	20,7	24,5
Avg.	**22,5**	**22,3**	**23,3**	**26,5**	**21,0**	**23,9**

Source: Eurostat, own work

We can make two main conclusions based on data from the table. First, the production structures of selected countries are very similar. Second, economies of selected countries are sufficiently diversified. This conclusion can be drawn from fact that any country has one or two dominant sectors with more than forty percent share in GDP. On the other hand, all countries have production equally distributed between the sectors industry, finance, trade-transport-communication and other services. Construction and agriculture has only marginal share in GDP. **EMU, in terms of production diversification, constitute an optimum currency area.**

5.1.4. Business cycle, similarity of shocks

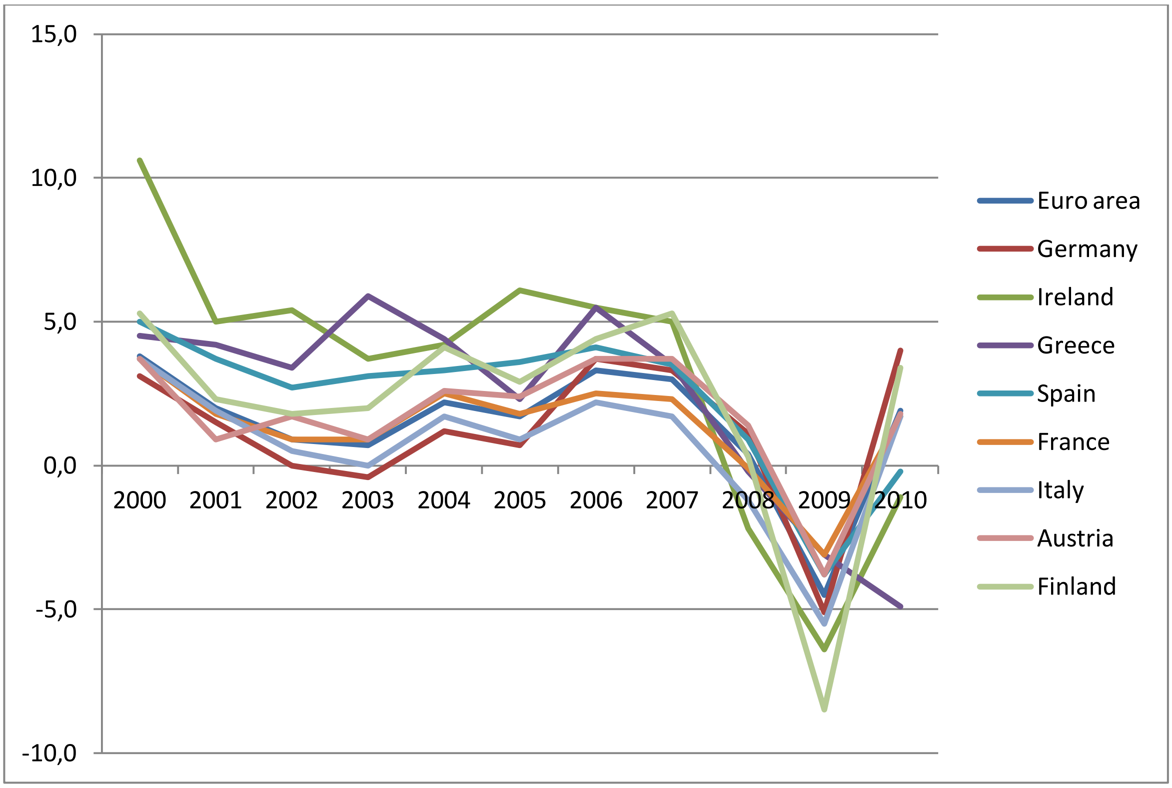
When country joins monetary union it loses opportunity to influence their monetary policy. In case of differences in business cycles of member countries of monetary union, monetary policy applied by a central authority (in the case of the EU it is ECB) may not be suitable for all members of monetary union. Some countries are in phase of expansion, others in recession. The central bank is then facing a difficult decision on interest rates. Whether promote economic growth in countries with recession by lowering interest rate, but exposing other countries to risk of high inflation and economic overheating. The probability of this phenomenon is minimized when monetary union members have similar business cycles and demand and supply shocks. Table 8 shows the evolution of real GDP of selected countries in 2000-2010.

Table 8 : Real GDP growth rate (%)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Avg.
Euro area	3,8	2,0	0,9	0,7	2,2	1,7	3,3	3,0	0,4	-4,5	1,9	**1,4**
Germany	3,1	1,5	0,0	-0,4	1,2	0,7	3,7	3,3	1,1	-5,1	4,0	**1,2**
Ireland	10,6	5,0	5,4	3,7	4,2	6,1	5,5	5,0	-2,2	-6,4	-1,1	**3,3**
Greece	4,5	4,2	3,4	5,9	4,4	2,3	5,5	3,5	-0,2	-3,1	-4,9	**2,3**
Spain	5,0	3,7	2,7	3,1	3,3	3,6	4,1	3,5	0,9	-3,8	-0,2	**2,4**
France	3,7	1,8	0,9	0,9	2,5	1,8	2,5	2,3	-0,1	-3,1	1,7	**1,4**
Italy	3,7	1,9	0,5	0,0	1,7	0,9	2,2	1,7	-1,2	-5,5	1,7	**0,7**
Austria	3,7	0,9	1,7	0,9	2,6	2,4	3,7	3,7	1,4	-3,8	1,8	**1,7**
Finland	5,3	2,3	1,8	2,0	4,1	2,9	4,4	5,3	0,3	-8,5	3,4	**2,1**

Source: Eurostat, own work

Chart 3 : Real GDP growth rate (%)



Source: Eurostat, own work

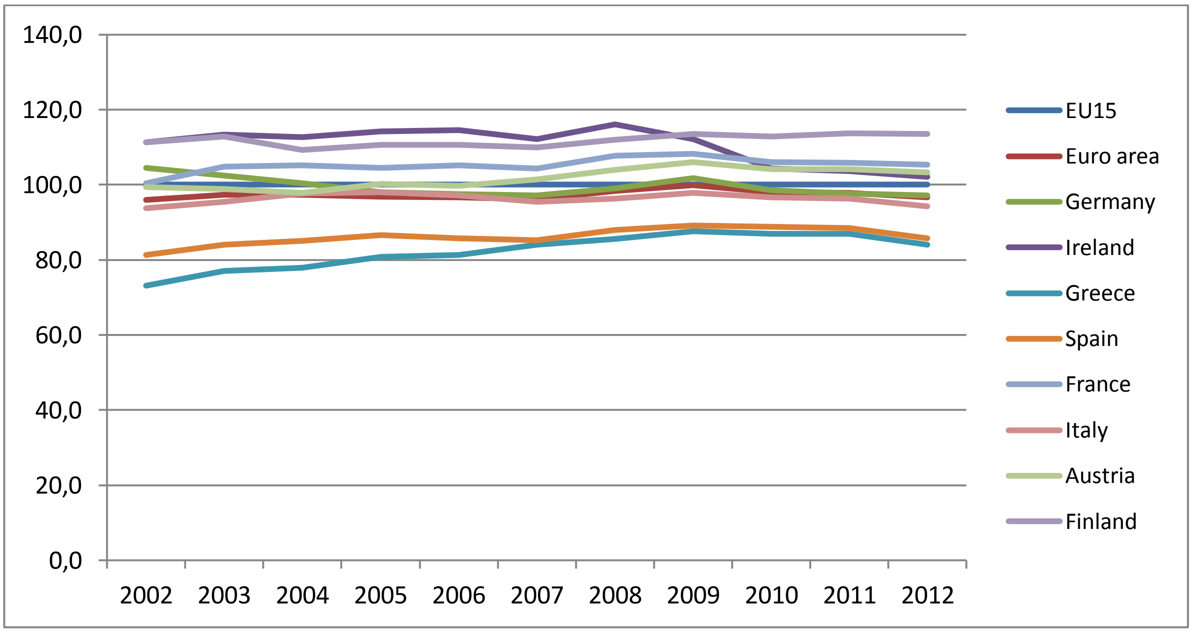
As the chart and table shows, some countries have very similar economic cycle. These include Germany, France, Austria and Italy. However, real GDP varies significantly in response to the global recession. From the perspective of OCA criteria is important period pre-2008, where can be traced the presence of asymmetric shocks and uneven development of economic cycles. This can be demonstrated for example in 2004 (compared to 2003), when some countries grew annually (Germany, France, Italy, Austria), others stagnated (Ireland, Spain) and Greece declined. A similar situation can be observed even in 2002 (compared to 2001), where different phases of the economic cycle (growth / decline / stagnation) can be seen in different countries. It is questionable to which extent is this criterion relevant in the overall analysis because of the short monitoring period of development of GDP. However, in terms of available data during the ten-year period it can be observed significantly different development of the countries and the presence of asymmetric shocks. Countries' response to the global crisis is also different, both in decline and in the recovery phase. **EMU, in terms of business cycle and similarity of shocks, does not constitute an optimum currency area.**

5.1.5. Price and wage flexibility

Member of the monetary union loses a flexible exchange rate and by adopting a common currency it changes to fixed exchange rate. The mechanism of adjustment to economic shocks by changes in nominal exchange rate is thus replaced by changes in prices and wages. It is therefore desirable that prices and wages are flexible enough. Otherwise, in case of a negative shock, it may result in a decline in the competitiveness with all the consequences for the economy - higher unemployment, lower product.

Chart 4 shows the comparative price levels of selected countries in 2002-2012. The basic information is the EU15 = 100. Values above 100 indicate therefore a higher price level than the EU15 average. Values below 100 indicate lower price level than the average of EU15.

Chart 4 : Comparative price levels (%)



Source: Eurostat, own work

From the data it can be seen that the majority of selected countries are facing a very inflexible price level - over the years it slightly rise or stagnate practically independent of the current phase of the economic cycle. The only difference is Ireland in the period after crises where prices dropped. **EMU, in terms of prices and wage flexibility, does not constitute an optimum currency area.**

5.1.6. Fiscal policy

When a county enters a monetary union and is then affected by asymmetric shock and the market adjustment mechanisms (mobility of labour, price flexibility, etc.) failed, there is the possibility to offset a negative shock by fiscal transfers. Countries facing a negative shock receive financial transfers from countries not affected by the shock in order to cover increased costs. Regarding the EU budget, which counts only for 1% of EU GDP and its increase is unlikely in the near future. Such limited financial resources cannot influence economic situation towards growth, even in medium-sized EU economies. **EMU, in terms of fiscal policy, does not constitute an optimum currency area.**

5.1.7. Results

There were 6 criteria tested among 8 EMU countries. Only two OCA criteria (Economic openness, Production diversification) are met in the EMU. On the other hand, EMU does not meet criteria labour mobility, similarity of business cycles, price and wage flexibility and fiscal transfers. There is a slight predominance of unfulfilled criteria so we can say that **EMU, in terms of OCA criteria, does not constitute an optimum currency area.** This means that the EMU member countries are not prepared to face the negative shocks, and most likely will respond differently to negative economic development in the future - some countries will be affected more significantly than others. This research was based on historical data and time series. Such information have been available even before starting the project of monetary union so we can conclude that it was also know by authors of this project. However political will prevailed over economic fact. According to our results it was clear since the start of utilization of euro as a single currency, that some countries might face difficulties when they lose their control over monetary policy.

Table 9 : Score card for OCA criteria

Criteria	Is it met?
Labour mobility	NO
Economic openness	YES
Production diversification	YES
Similar business cycles	NO
Price and wage flexibility	NO
Fiscal transfers	NO

Source: own work

5.2. Cluster analysis - dataset

The decision whether the European Union is one cluster with similar economic characteristics was based on statistical method cluster analysis. This method was carried out using the statistical program STATISTICA. Data set that characterized the European economies was obtained from official statistical office of the EU- Eurostat. Eurostat is a Directorate-General of the European Commission which is responsible for providing statistical data to EU institutions and promotion of harmonisation of statistical methods across its member states. The origin of the data thus guarantees that the individual statistics are descended from a single register and are therefore comparable. The data sample compares the EU27, since cluster analysis is conducted in two years, 2007, ie before the onset of the crisis in Europe and in 2012, when it may be seen that the impact of the crisis fades, but the consequences are still apparent. Results of cluster analysis with data for 2007 will indicate the situation in Europe before the crisis, while the analysis performed based on data from 2012 will indicate the impact of the crisis on the position of EU member states, whether there is a new layout. Individual countries have been described using 14 indicators in total. These indicators include mainly Key Economic Indicators of each country. It is GDP per Capita in Purchasing power parity, Unemployment rate, Inflation, Expenditures on social protection expressed as share of GDP, General government deficit of surplus, General government gross debt, Trade balance in goods and services, Labour productivity, Gross value added per employee, Long term government bond yield, Gross domestic expenditures on R&D, People at risk of poverty and two indicators showing how is particular economy connected to EU trade – Intra-EU trade, meaning exports and imports to EU. Values of particular indicators for all 27 countries see Annex 1and 2. Some values in the data set were not published and therefore replaced by average without affecting the outcome of the analysis.

Two methods of cluster analysis will be used in order to divide states into clusters and then describe them. The first method is Ward's method whose output is a dendrogram. Second method will be k-means clustering. The output of the clustering using k-means are the average values of the individual parameters for the created clusters. The output is a table diameter clusters from which will be seen as between the individual clusters are differences in individual indicators.

5.2.1. Results for 2007

The number of clusters was determined by simple vertical cut at distance 160 in the dendrogram (see Dendrogram 1). The cut cross over 4 connecting lines in dendrogram and we can easily subtract that cluster 1 contains countries Belgium, Germany, France, Denmark, Sweden, Austria, Finland, United Kingdom, Netherlands and Ireland, cluster 2 includes just one country – Luxembourg, cluster 3 is formed by Bulgaria, Romania, Estonia, Slovakia, Latvia, Lithuania, Hungary, Poland, and the last cluster 4 contains countries as Czech Republic, Slovenia, Spain, Cyprus, Malta, Portugal, Greece and Italy.

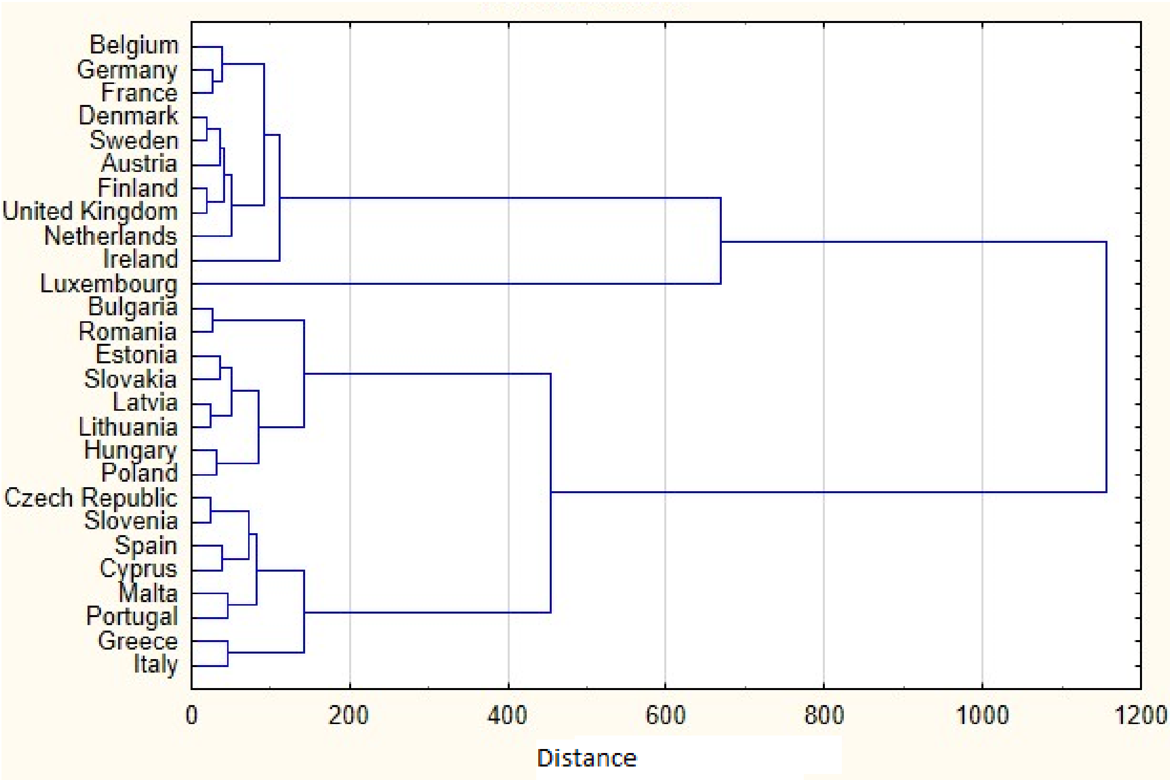
Table 10 : Countries by clusters 2007

Cluster 1	Cluster 2	Cluster 3	Cluster 4
Belgium	Luxembourg	Czech Rep.	Bulgaria
Denmark		Greece	Estonia
Germany		Spain	Latvia
Ireland		Italy	Lithuania
France		Cyprus	Hungary
Netherlands		Malta	Poland
Austria		Portugal	Romania
Finland		Slovenia	Slovakia
Sweden			
UK			

Source: own work

Cluster analysis done by Ward's method cannot give us more detailed information; however it is possible to conclude some findings. It is obvious that cluster 1 is formed by so-called "core" countries of the European Union. Beside United Kingdom, Sweden and Denmark who has voluntarily waived the right to membership, all other countries in cluster 1 are members of monetary union which means that they use common currency euro. Membership in monetary union involves a high degree of convergence of the countries and it is confirmed by the location in the same cluster. Second cluster is rather specific as it contains only Luxembourg. It ranks Luxembourg among the exceptional EU country because it exhibits values above average in all areas surveyed. Cluster 3 contains only countries which joined the EU in 2004 during "eastern enlargement" and later. There are all three Baltic republics, all members of Visegrad group except Czech Republic, and Bulgaria and Romania which joined the EU in 2007. None of the countries from cluster three were member of the EMU in 2007. The last cluster is made up of a very diverse group of states. There is a founding state of the EU (Italy), as well as all the states of the "southern wing", which joined the European Union in the eighties and the rest of the countries of eastern enlargement also including Czech Republic. Interesting about cluster 4 is the fact that it contains both Euro area countries, but also countries that have not yet accepted euro. The reason why they did not accepted euro is that in majority of cases they did not met conditions given by Maastricht Treaty. The presence of countries using euro as a currency between countries outside the euro area shows that there are differences between the members of monetary union even before the crisis.

Dendrogram 1 : Ward's method, Euclidian distances, 2007



Source: STATISTICA 12 output

In order to get more detailed information concerning differences among individual clusters and indicators, the k-means clustering analysis was done. Following results were obtained.

Table 11 : K-means clustering, 2007

Variable	Cluster 1	Cluster 2	Cluster 3	Cluster 4
GDP per Capita in PPS (EUR hundreds)	306,00	685,00	225,38	142,00
Unemployment rate (%)	5,93	4,18	6,50	7,06
Inflation rate (%)	1,97	2,70	2,49	5,94
Expenditure on social protection (% of GDP)	27,00	19,30	21,41	15,30
General government deficit/surplus (% of GDP)	0,78	3,70	-1,09	-1,19
General government gross debt (% of GDP)	49,00	6,70	60,74	25,14
Intra-EU trade (% of total export)	66,64	87,80	67,85	73,16
Intra-EU trade (% of total imports)	66,58	73,70	69,03	71,44
Trade balance, good and services (% of GDP)	4,91	32,30	-4,44	-9,91
Labour productivity (EU27=100)	116,30	179,70	90,03	57,88
Gross value added per employee	68,47	89,61	40,02	18,15
Long term government bond yield	4,36	4,46	4,47	5,36
Gross domestic expenditures on R&D (% of GDP)	2,33	1,58	1,01	0,68
People at risk of poverty (% of total population)	18,74	15,90	22,51	34,69

Source: STATISTICA 12 output, own work

Cluster 2 has higher than average values in all the areas surveyed. It is the same concerning GDP per Capita in PPS, where Luxembourg indicated more than two times higher number that cluster number 1 which reaches average of EUR 30.6 thousands. On contrary cluster 4 shows result significantly below average and it does not even reaches half of the average of GDP in countries of cluster 1. Countries in cluster three are average concerning level of GDP. In 2007 there were not significant differences among clusters concerning unemployment. Cluster 1 containing highly developed countries was unemployment rate at the level of almost 6 % and there was just 1 percentage point difference to cluster 4 which registered unemployment rate 7 %. Inflation rate in 2007 registered differences among clusters. Clusters 1,2 and 3 reached inflation from 2 – 2.5 %, however cluster 4 counts for almost 6 %. This differential was caused mainly because of high inflation rates in Baltic republics and Bulgaria and Romania. There are also huge differences concerning Expenditures on social protection. In countries in cluster 1 27 % of countries’ GDP was spend on social protection. Cluster 4 countries spend only 15 % of their GDP in average. In 2007 cluster 1 and 2 countries’ government were generating budget surplus, especially Luxembourg. Other two clusters were generation deficit of more that 1 % of GDP. General government gross debt was highest among countries in cluster 3, they have not been fulfilling one of the convergence criteria in 2007. It was especially caused by not sufficient results in southern states – Greece, Italy, Portugal and Malta. On contrary, low government debt was in countries in cluster 4. Baltic countries – Estonia, Latvia and Lithuania, together with Romania and Bulgaria are characterised by low level of indebtedness. The most comparable indicators are share of Intra-EU trade on total trade. All countries of the European Union show a high degree of mutual trade dependence. More than 70 % of trade is intra-EU trade. However there are significant differences in trade balances of member countries. Clusters 1 and 2 generates important surplus of trade balance. Countries in cluster 3 are in deficit of trade balance over 4 % of GDP and cluster 4 registered deficits of almost 10 % of GDP. Labour productivity in particular countries is compared to EU27 average which represent 100 %. It is important to point out tremendous difference between labour productivity in Luxembourg and cluster 3 and 4. In case of cluster 3 the labour productivity is only half of labour productivity of Luxembourg, in case of cluster 4 it is three times lower. Results of Gross value added per employee copy the results of labour productivity. Interests on long term government bonds registered only small differential between clusters in 2007. There has not been more than 1 percentage point difference in interest rates. The last indicator (percentage of people at risk of poverty) shows important differences and indicates important differences in standards of living. More than 1/3 of inhabitants of countries of cluster 4 are at risk of poverty, compared to less than one 1/5 of inhabitants of countries in cluster 1.

5.2.2. Results for 2012

Cluster analysis was then run for year 2012. The number of clusters was again determined by simple vertical cut at distance 160 in the dendrogram (see Dendrogram 2). From the first view it is possible to determine that the situation has changed during five years. The cut cross over 6 connecting lines in dendrogram which means that the number of clusters increased from original 4 in 2007 to 6 in 2012.

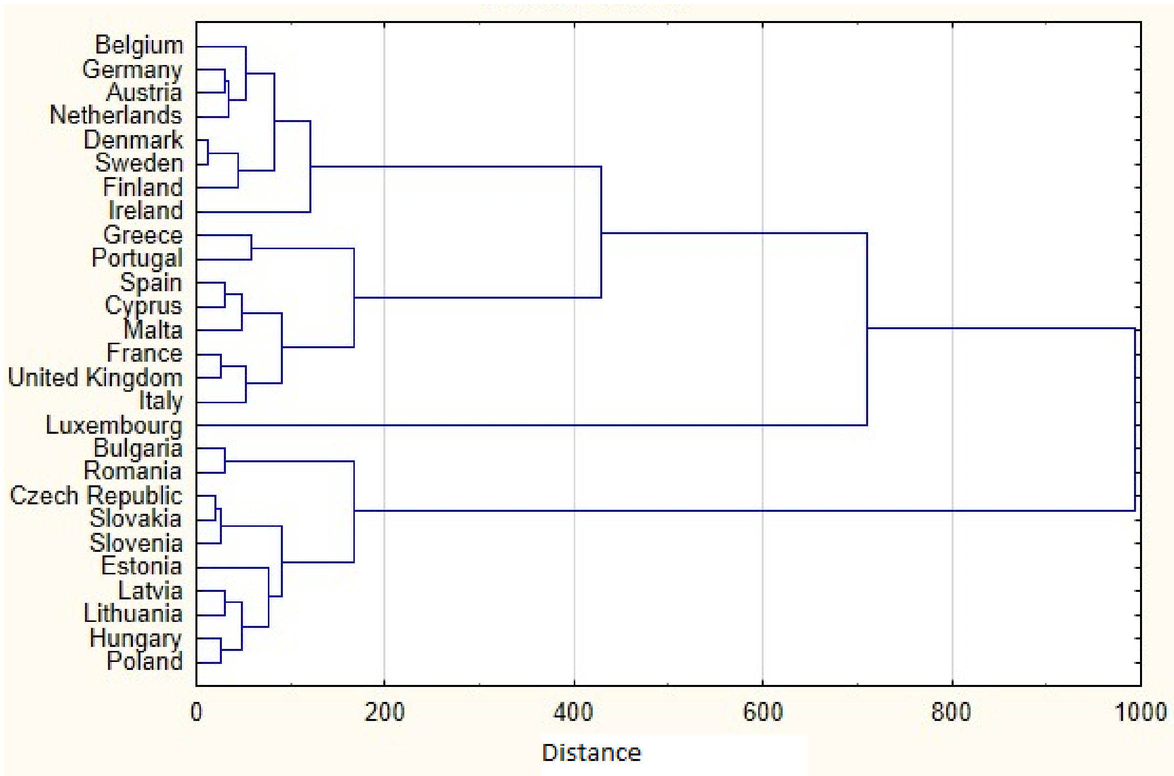
Table 12 : Coutries by clusters 2012

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Belgium	Luxembourg	Spain	Czech Rep.	Greece	Bulgaria
Denmark		France	Estonia	Portugal	Romania
Germany		Italy	Latvia		
Ireland		Cyprus	Lithuania		
Netherlands		Malta	Hungary		
Austria		UK	Poland		
Finland			Slovenia		
Sweden			Slovakia		

Source: STATISTICA 12 output

We can easily subtract that cluster 1 contains countries Belgium, Denmark, Germany, Ireland, Netherland, Austria, Finland, Sweden, cluster 2 has not changed compared to previous results and includes just Luxembourg, cluster 3 is formed by Spain, France, Italy, Cyprus, Malta, United Kingdom, cluster 4 contains eight countries – Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia, Slovakia. In contrast to cluster analysis conducted with the data for 2007, there are two new clusters created. Cluster 5 where we can find Greece and Portugal and cluster 6 including Bulgaria and Romania. Based on Ward's method, we can make simple conclusions. As the number of clusters in the European Union increased from 4 to 6 it says that heterogeneity among European countries has risen. It is due the effect of crises and some countries lost their position compared to year 2007. Cluster 1, where we can find “elite” group of coutries, from economical point of view. This group left two countries – France and United Kingdom. The fall of France is a significant signal, as one of the founding members of the EU has been unable to cope with the consequences of the crisis. In contrast, Ireland, which is ranked among the so-called PIIGS countries and was heavily affected by the crisis, was able to maintain its position in the cluster 1 and it is evidence that 5 years was enough to suppress the effect of the crisis. Luxembourg has maintained its exceptional, distinct position and form a separate cluster 2. France and United Kingdom has joined cluster 3 which is formed in majority of cases by so-called “southern wing” countries. Beside United Kingdom there are just members of EMU in cluster 3. Czech Republic left cluster 3 and joined the rest of the countries of “eastern enlargement” in cluster 4. Cluster 4 is entirely made up of countries that joined the EU in 2004 and thus form geographically and economically coherent whole unit. Compared to 2007, Slovenia, Slovakia, Estonia and Latvia have joined the Economic and Monetary Union of the European Union. Cluster 5 is formed by Greece and Portugal, two PIIGS countries. Their “exceptional” position is largely due to a sharp increase in public debt in recent years, but also structural problems and still ongoing effects of the crisis. Both states in cluster 5 are members of EMU. Cluster 6 contains Bulgaria and Romania. A separate cluster for these two countries only confirms the different economic structure and economic performance compared to the rest of the EU.

Dendrogram 2 : Ward’s method, Euclidian distances, 2012



Source: STATISTICA 12 output

K-means clustering will give us more detailed information about the differences between clusters.

Table 13 : K-means clustering, 2012

Variable	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
GDP per Capita in PPS (EUR thousands)	318,63	672,00	250,50	185,75	193,00	124,50
Unemployment rate (%)	7,58	5,10	12,02	11,19	20,10	9,65
Inflation rate (%)	2,31	2,90	2,83	3,64	1,90	2,90
Expenditure on social protection (% of GDP)	30,63	22,50	26,37	19,25	28,35	17,00
General government deficit/surplus (% of GDP)	-3,10	-0,60	-5,70	-2,91	-7,70	-1,90
General government gross debt (% of GDP)	72,59	21,70	91,63	47,41	140,50	28,20
Intra-EU trade (% of total export)	63,15	79,60	54,28	71,89	57,55	64,30
Intra-EU trade (% of total imports)	65,03	77,20	61,38	71,09	58,75	66,05
Trade balance, good and services (% of GDP)	6,59	29,10	0,15	2,54	-2,80	-4,20
Labour productivity (EU27=100)	116,85	162,00	103,67	72,31	83,40	47,15
Gross value added per employee	74,13	81,60	50,90	25,16	37,71	11,70
Long term government bond yield	2,48	1,82	4,46	5,04	16,53	5,59
Gross domestic expenditures on R&D (% of GDP)	2,73	1,71	1,31	1,43	1,10	0,53
People at risk of poverty (% of total population)	19,29	18,40	25,10	25,84	29,95	45,50

Source: STATISTICA 12 output

We can see that after crises, Cluster 5 containing Greece and Portugal has registered decrease in indicator GDP per capita in PPS. It ranks then almost on the same level like countries in cluster 4. Cluster 6 exhibit results significantly below average. Important difference shows the indicator unemployment rate. All clusters registers worse results compared to year 2007; however cluster 3 and 4 has almost doubled the rate of unemployment. Greece and Portugal in cluster 5 reach extreme values over 20 %. Inflation rate indicator does not indicate any abnormalities and in general inflation is low. Expenditures on social protection as a percentage of GDP increased among all clusters. Origin of this phenomenon can be found in higher unemployment rate. Higher unemployment rate resulting in higher expenditures on social protection causes pressure on government budget. In 2007 there were clusters which registered surpluses of general budget, however all clusters in 2012 there are 3 out of 6 clusters who does not even meet the general budget deficit criterion. Especially clusters 3 and 5 where majority of PIIGS countries belong shows extreme values reaching almost 6 % of GDP, resp. 8 %. General government debt which was described as one of the stimulants of dramatic process of crisis in some countries registered big change. Even states in cluster 1, generally considered as economies with high economic performance, recorded increase by more than 20 percentage points during period 2007 – 2012. The worse numbers concerning indebtedness show clusters 3 and 4. Greece, Spain and Portugal general government debt exceeded 100 % of their GDP. On the other hand, countries which joined the EU after 2004 (Cluster 4 and 6) shows relatively positive results concerning general government debt. Intra-EU trade slightly decreased, it may mean the diversification of exports and imports in order not to be to dependant only on EU partners. Only cluster 5 and 6 registered negative trade balance. Despite worse results in many other indicators, the labour productivity in Greece and Portugal stays higher than in countries in cluster 4 that includes all "eastern enlargement" countries. Gross value added per employee stays extremely low in Bulgaria and Romania compared to cluster 1. Cluster 4 shows results below the EU average concerning this indicator. Long term government bond yield in cluster 5 reaches 16.5 %, it makes these countries unable to sell their bonds on financial markets. Despite relatively high indebtedness of countries in cluster 1, the interest rate stay relative low and long term government bond yield is 2.73 %. There are important differences in investment into R&D among European countries. It varies from 2.73 % of GDP in cluster 1 to 0.53 % of GDP in cluster 6. Deteriorating economic situation has resulted in deterioration of the social conditions. There is almost 25 % of European citizens at risk of poverty. Risk of poverty is highest in countries belonging to cluster 5 and 6.

5.2.3. Main findings

Based on the results of the cluster analysis, we can confirm with certainty that European Union is not economically cohesive regional integration. Conversely, member countries are split into several clusters, which are characterized by different economic indicators. In 2007 there were 4 clusters in the EU. Cluster 2 is however statistically insignificant as it consists only of Luxembourg. Table 12 shows the division of countries into clusters. It also gives us information about the time they entered the EU, whether a country is or is not a member of the EMU and whether it counts among so-called PIIGS countries. Cluster 1 consists of countries which all entered the EU before 1995 and except of countries with euro opt-out (Denmark, Sweden, UK) they are all part of euro area. Ireland is the only PIIGS member in cluster 1, but we can claim that Ireland did well after crises as it still counts among "core" group in 2012. The structure of members in the cluster 3 shows us that the EU/EMU does not form a coherent area. Four PIIGS countries (Greece, Spain, Italy, and Portugal) showed different economic performance and different degree of convergence than the rest of the euro area in 2007. The last cluster contains just countries entering the EU after 2004 and none is member of the EMU.

Table 14 : Clusters 2007

Cluster 1	Cluster 2	Cluster 3	Cluster 4
Belgium	Luxembourg	Czech Rep.	Bulgaria
Finland		Greece	Estonia
Germany		Spain	Latvia
Ireland		Italy	Lithuania
France		Portugal	Hungary
Netherlands		Slovenia	Poland
Austria		Cyprus	Romania
Denmark		Malta	Slovakia
Sweden			
UK			

PIIGS	Entered 2004 or later	Entered until 1995	2007 in EMU

Source: own work

Table 13 shows that between the years 2007 to 2012 there was a further fragmentation of the EU into 6 clusters.

Table 15 : Clusters 2012

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Belgium	Luxembourg	Spain	Czech Rep.	Greece	Bulgaria
Finland		Italy	Estonia	Portugal	Romania
Germany		France	Latvia		
Ireland		Cyprus	Lithuania		
Netherlands		Malta	Hungary		
Austria		UK	Poland		
Denmark			Slovenia		
Sweden			Slovakia		

PIIGS	Entered 2004 or later	Entered until 1995	2007 in EMU

Source: own work

6. Conclusion

Multilateralism failed. Regionalism is booming. European Union is currently the most successful regional integration in the world measured by the depth of integration since already 18 countries together forms the monetary union and they have adopted euro as the common currency. However, recent economic crises revealed chronic problems in some EU countries. The main objective of this diploma thesis was the examination of the European Union with focus on analysis of coherence of member states and implications of potential disparities on the course of crises in 2008.

The first part of the thesis provides basic theoretical background concerning regionalism. The reason for the growing importance of regionalism in the world economy is disappointment of multilateralism, which is represented by the World Trade Organization (WTO). Inability of reaching consensus on common issues because of the large number of participants in negotiation made trends which stimulate integration much more intense at the regional level rather than on global. Regional integration can develop in several stages thus varying the depth of integration from free trade area, where only mutual tariff trade barriers are removed between countries, to the highest level of integration - economic union. In case of economic union the authorities of newly created block control monetary and fiscal policy. There is a wide range of motives why states merge into larger groupings. There are economic and political reasons behind regional integration. Countries try to achieve economic prosperity by integration of their markets in goods, services, labour and capital. They search to enhance efficiency in production, exploit economies of scale, develop factor mobility across the borders and gain higher rates of economic growth. Country's involvement in a regional grouping can provide an improvement in international bargaining position and security issues.

The European Union is a common market of 28 countries and a monetary union represented by the European monetary union (EMU) established in 1999. There are 18 members of the EMU in 2014. For comparative purposes theoretical part of the thesis provides a list of regional groupings in American Region, Asian Pacific Region and Sub-Saharan Africa.

The theory of optimum currency area (OCA), originally introduced by economist Robert A. Mundell is described. Together with economist who followed his work he listed OCA criteria which constitute assumptions for effective functioning monetary union.

Criteria of labour mobility, economic openness, production diversification, similarity of business cycles and fiscal policy are tested in analytical part of the thesis.

Theoretical block is closed by description of recent global crisis with an emphasis on its impact in Europe. The crisis originated in US affected the EU countries even with greater intensity than the initial epicentre. As a result of underestimated long-term government debt the global financial crisis spilled over into the debt trap and a group of so-called PIIGS (Portugal, Greece, Ireland, Italy, Spain) countries emerged. Taking into account the fact that all these countries were members of the euro area, local problem became EU-wide since the euro's credibility was called in question.

In the first part of analysis 5 OCA criteria were tested in order to determine whether EMU constitutes optimum currency area. The data from selected countries of EMU indicates different level of unemployment rates in 2002 – 2012. The difference between Austria and Spain in 2002 reaches more than 7 percentage points. Labour mobility within the EMU does not play a role of stabilizing mechanism. However, criterion of economic openness given by the share of exports and imports to GDP and criterion of production diversification were fulfilled. All EMU countries show high share of external trade to GDP so high openness to foreign trade, reaching at least 30 % in case of Italy in 2012. Production structures in EMU countries are relatively similar and sufficiently diversified between sectors agriculture, industry, construction, trade, transport, communication services, financial services and other services. The criterion of similarity of business cycles was not met as different phases of the economic cycle (growth/ decline/ stagnation) can be seen in different countries even in period pre-2008. Also prices and wages showed up as very inflexible in EMU countries probably caused by rigid labour markets. Fiscal policy in EU is carried out by using of common budget. However EU budget counts only for 1 % of EU GDP and it cannot influence economic cycle toward growth. The EMU, in terms of OCA criteria, does not constitute an optimum currency area.

Results of cluster analysis suggest that the European Union is not economically cohesive regional integration. Conversely, member countries are split into several clusters with different economic level and performance. In 2007 there were 4 clusters, majority of euro area countries were concentrated in cluster 1 ("core" of the EU/EMU). However, 4 PIIGS countries that also use euro (Greece, Portugal, Spain and Italy) showed worse economic results and were found in cluster along with countries of “eastern enlargement”. In 2012 heterogeneity in the EU increased and member countries were split into 6 clusters.

To sum up the research it must be point out that EMU is not optimum currency area and whole EU consists of several clusters with different economic level. EMU countries will probably tend to react differently to negative economic shock again in the future as they reacted during the world economic crises. Future membership in the EMU cannot be recommended to those countries that do not economically catch up the level of countries in cluster 1. Membership in euro area might have had negative effect for PIIGS countries in context how they deal with consequences of crises and their membership in EMU is questionable in terms of future negative shock.

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8. Annexes

Annex 1: Data set for EU countries 2007

Annex 2: Data set for EU countries 2012

Annex 1: Data set for EU countries 2007

Country	GDP per Capita in PPS (€)	Unemployment rate (%)	Inflation rate (%)	Expenditure on social protection (% of GDP)	General government deficit/surplus (% of GDP)	General government gross debt (% of GDP)	Intra-EU trade (% of total export)	Intra-EU trade (% of total imports)	Trade balance, good and services (percentage of GDP)	Labour productivity (EU27=100)	Gross value added per employee	Long term government bond yield	Gross domestic expenditures on R&D (% of GDP)	People at risk of poverty (% of total population)
Belgium	29 000,00	7,48	1,80	26,90	-0,10	84,00	76,10	70,60	3,80	127,50	79,89	4,33	1,89	21,60
Bulgaria	10 000,00	6,94	7,60	14,10	1,20	17,20	60,80	58,50	-19,70	37,40	9,70	4,54	0,45	60,70
Czech Republic	20 700,00	5,33	3,00	18,00	-0,70	27,90	85,30	80,10	2,70	76,20	29,99	4,30	1,37	15,80
Denmark	30 600,00	3,77	1,70	30,70	4,80	27,10	70,10	72,80	6,90	104,60	73,60	4,29	2,58	16,80
Germany	28 900,00	8,68	2,30	27,80	0,20	65,20	64,70	64,60	7,00	108,20	57,57	4,22	2,53	20,60
Estonia	17 500,00	4,61	6,70	12,10	2,40	3,70	70,20	78,60	-9,20	66,60	19,49	N/A	1,08	22,00
Ireland	36 500,00	4,69	2,90	18,30	0,20	24,90	63,50	70,00	9,00	136,20	80,04	4,31	1,28	23,10
Greece	22 500,00	8,28	3,00	24,80	-6,50	107,40	63,40	58,20	-14,10	95,30	44,58	4,50	0,60	28,30
Spain	26 200,00	8,28	2,80	20,80	2,00	36,30	70,80	63,00	-6,70	103,00	37,61	4,31	1,27	23,30
France	26 900,00	8,38	1,60	30,90	-2,70	64,20	65,50	69,50	-1,50	115,40	70,94	4,30	2,08	19,00
Italy	26 000,00	6,11	2,00	26,60	-1,60	103,30	60,90	57,70	-0,30	111,40	61,84	4,49	1,17	26,00
Cyprus	23 600,00	3,90	2,20	18,20	3,50	58,80	71,80	68,90	-6,20	85,20	42,20	4,48	0,44	25,20
Latvia	14 300,00	6,08	10,10	11,30	-0,40	9,00	72,80	77,40	-20,10	51,30	16,16	5,28	0,60	35,10
Lithuania	15 500,00	4,28	5,80	14,40	-1,00	16,80	64,80	68,30	-13,30	59,50	14,40	4,55	0,81	28,70
Luxembourg	68 500,00	4,18	2,70	19,30	3,70	6,70	87,80	73,70	32,30	179,70	89,61	4,46	1,58	15,90
Hungary	15 400,00	7,37	7,90	22,70	-5,10	67,00	79,00	69,50	0,90	66,50	22,28	6,74	0,98	29,40
Malta	19 600,00	6,33	0,70	17,70	-2,30	60,70	44,20	74,00	-1,20	92,20	N/A	4,72	0,57	19,40
Netherlands	33 100,00	3,58	1,60	28,30	0,20	45,30	78,10	50,10	8,20	114,30	59,91	4,29	1,81	15,70
Austria	30 900,00	4,44	2,20	27,80	-0,90	60,20	72,60	79,30	5,70	116,90	65,99	4,30	2,51	16,70
Poland	13 600,00	9,62	2,60	18,10	-1,90	45,00	78,90	73,30	-2,90	62,10	26,86	5,48	0,57	34,40
Portugal	19 600,00	8,90	2,40	23,90	-3,10	68,40	77,10	76,60	-8,00	73,90	24,73	4,42	1,17	25,00
Romania	10 400,00	6,39	4,90	13,60	-2,90	12,80	72,00	71,30	-13,90	43,30	13,67	7,13	0,52	45,90
Slovenia	22 100,00	4,84	3,80	21,30	0,00	23,10	69,30	73,70	-1,70	83,00	33,32	4,53	1,45	17,10
Slovakia	16 900,00	11,22	1,90	16,10	-1,80	29,60	86,80	74,60	-1,10	76,30	22,66	4,49	0,46	21,30
Finland	29 400,00	6,88	1,60	25,40	5,30	35,20	56,80	64,10	5,10	113,50	66,58	4,29	3,47	17,40
Sweden	31 200,00	6,13	1,70	29,20	3,60	40,20	61,20	71,10	7,50	114,70	69,92	4,17	3,43	13,90
United Kingdom	29 500,00	5,30	2,30	24,70	-2,80	43,70	57,80	53,70	-2,60	111,70	60,27	5,06	1,75	22,60

Annex 2: Data set for EU countries 2012

Country	GDP per Capita in PPS (€)	Unemploy ment rate (%)	Inflation rate (%)	Expenditure on social protection (% of GDP)	General government deficit/surplus (% of GDP)	General government gross debt (% of GDP)	Intra-EU trade (% of total export)	Intra-EU trade (% of total imports)	Trade balance, good and services (% of GDP)	Labour productivity (EU27=100)	Gross value added per employee	Long term government bond yield	Gross domestic expenditures on R&D (% of GDP)	People at risk of poverty (% of total population)
Belgium	30 700	7,60	2,60	30,40	-4,00	99,80	70,00	67,80	1,10	127,20	85,70	3,00	2,24	21,60
Bulgaria	12 100	12,30	2,40	17,70	-0,80	18,50	58,40	58,60	-3,70	44,30	10,50	4,50	0,64	49,30
Czech Republic	20 700	7,00	3,50	20,40	-4,40	46,20	80,90	75,10	5,60	72,30	31,80	2,78	1,88	15,40
Denmark	32 200	7,50	2,40	34,20	-4,10	45,40	63,30	70,70	5,10	111,60	78,90	1,40	2,99	19,00
Germany	31 500	5,50	2,10	29,40	0,10	81,00	57,10	63,50	5,90	106,20	57,60	1,50	2,92	19,60
Estonia	18 300	10,10	4,20	16,10	-0,20	9,80	66,00	80,00	0,20	68,70	24,10	N/A	2,18	23,40
Ireland	33 000	14,70	1,90	29,60	-8,20	117,40	59,10	67,10	24,20	142,60	90,20	6,17	1,72	N/A
Greece	19 200	24,30	1,00	30,20	-9,00	156,90	44,10	45,70	-5,00	91,70	N/A	22,50	0,69	34,60
Spain	24 500	25,00	2,40	26,10	-10,60	86,00	63,50	54,60	0,70	109,00	49,90	5,85	1,30	28,20
France	27 800	10,20	2,20	33,60	-4,80	90,20	58,90	67,20	-2,20	115,10	N/A	2,54	2,26	19,10
Italy	25 700	10,70	3,30	29,70	-3,00	127,00	53,70	52,90	1,10	107,10	65,60	5,49	1,27	29,90
Cyprus	23 400	11,90	3,10	22,60	-6,40	86,60	60,40	69,00	-2,60	92,90	37,60	7,00	0,47	27,10
Latvia	16 400	14,90	2,30	15,10	-1,30	40,60	63,50	78,20	-3,90	64,10	15,90	4,57	0,66	36,20
Lithuania	18 300	13,40	3,20	17,00	-3,20	40,50	60,50	56,80	0,80	72,10	15,20	4,83	0,90	32,50
Luxembourg	67 200	5,10	2,90	22,50	-0,60	21,70	79,60	77,20	29,10	162,00	81,60	1,82	N/A	18,40
Hungary	17 000	11,00	5,70	23,00	-2,00	79,80	75,80	70,20	7,30	69,70	23,30	7,89	1,30	32,40
Malta	21 900	6,40	3,20	18,90	-3,30	71,30	39,00	76,70	6,00	92,80	N/A	4,13	0,84	22,20
Netherlands	32 600	5,30	2,80	32,30	-4,10	71,30	76,00	45,30	8,40	108,90	65,90	1,93	2,16	15,00
Austria	33 200	4,40	2,60	29,50	-2,50	74,00	69,20	75,90	3,20	115,10	68,80	2,37	2,84	18,50
Poland	17 100	10,20	3,70	19,20	-3,90	55,60	75,70	67,20	0,30	72,20	26,60	5,00	0,90	26,70
Portugal	19 400	15,90	2,80	26,50	-6,40	124,10	71,00	71,80	-0,60	75,10	28,00	10,55	1,50	25,30
Romania	12 800	7,00	3,40	16,30	-3,00	37,90	70,20	73,50	-4,70	50,00	12,90	6,68	0,42	41,70
Slovenia	21 400	8,90	2,80	25,00	-3,80	54,40	68,80	67,20	4,80	78,80	34,80	5,81	2,80	19,60
Slovakia	19 400	14,00	3,70	18,20	-4,50	52,40	83,90	74,00	5,20	80,60	29,60	4,55	0,82	20,50
Finland	29 500	7,70	3,20	30,00	-1,80	53,60	53,60	62,80	-1,00	107,40	65,40	1,89	3,55	17,20
Sweden	32 200	7,90	0,90	29,60	-0,20	38,20	56,90	67,10	5,80	115,80	80,50	1,59	3,41	18,20
United Kingdom	27 000	7,90	2,80	27,30	-6,10	88,70	50,20	47,90	-2,10	105,10	57,50	1,74	1,72	24,10

9. List of tables/charts/dendrograms