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Diploma Thesis

Expected Impact of the Euro Adoption on the Czech Economy

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Declaration

I declare that I worked on my diploma thesis "Expected impact of the Euro adoption on the Czech economy" solely and completely on my own and that I have marked all quotations in the text. The literature and other material I have used are mentioned in the bibliography section of the thesis.

Prague, the 1st November 2011   Bc. Vítězslav Švec

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Expected Impact of the Euro Adoption on the Czech Economy

Očekávaný dopad přijetí eura na českou ekonomiku

Summary

This diploma thesis themed "Expected Impact of the Euro Adoption on the Czech Economy" is focused on few economic indicators analysis which play very important role in a general viewpoint on the economic development level and its readiness for the common European currency adoption. The theoretical part of this thesis helps as an introduction to the historical development of the common European economic policy which led in the common European currency adoption and describes the matters of European economic area as well as the fiscal and monetary policy of today's euro area. In the main part of this thesis is firstly evaluated the current formal readiness of the Czech economy on the euro adoption, furthermore are written the most important advantages and disadvantages of the common currency usage and finally in the last part of the main section is described the expected impact of the euro adoption itself on the most important economic indicators of the Czech economy with comparison to the other European economies which have already the common currency adopted and are by some aspects similar to the Czech economy.

Keywords

The Czech Republic, European Union, Euro area, Euro, Economy, European Central Bank, Czech National Bank

Souhrn

Tato diplomová práce na téma „Předpokládaný dopad přijetí eura na českou ekonomiku" je zaměřena na analýzu několika ekonomických ukazatelů, které hrají důležitou roli při celkovém pohledu na stupeň ekonomické úrovně a její připravenost na přijetí společné evropské měny. Teoretická část této práce slouží jako úvod do historického vývoje společné evropské hospodářské politiky, která vyústila v přijetí společné evropské měny a popisuje problematiku evropského hospodářského prostoru spolu s měnovou a rozpočtovou úlohou dnešní eurozóny. V praktické části této práce je nejprve zhodnocena aktuální formální připravenost české ekonomiky na přijetí společné měny, dále jsou sepsány nejdůležitější klady a zápory užívání společné měny a v poslední části této sekce je uveden samotný předpokládaný vliv přijetí eura na jednotlivé ekonomické ukazatele české ekonomiky s porovnáním s jinými ekonomikami, které už společnou měnu přijaly a jsou nějakými aspekty podobné té české.

Klíčová slova

Česká republika, Evropská unie, Eurozóna, Euro, Ekonomika, Evropská centrální banka, Česká národní banka

Content

1 Introduction

Within a context of integration process is the idea of a common European currency not new. This idea appeared in several forms and with different intensity in more than fifty years of recent history. The first vision of the common currency was not even for the economical purposes mainly but as a natural evolution of the European integration.

The euro was launched on January 1st, 1999, when it became the currency of more than 300 million people in Europe. At that time it was unclear how this project with significant level of risk would capture. It was well known this project might the EU economy get strengthen but on the other hand could have the common economy completely destabilize which fortunately did not happened. Indeed the new currency emergence was a relatively smooth and comfortable process.

For the first three years it was used only for accounting purposes and the euro cash started to be a regular European currency on 1 January 2002, when it replaced, at fixed conversion rates, the banknotes and coins of the national currencies in 12 countries. During the first years of its existence euro received the excellent reputation as a healthy currency with a solid monetary policy and covered by functional institutional frame.

Although all the EU Agreement signatories have not joined the common currency yet, only 17 of the 27 member states, the euro is now both the most evident symbol and deepest material form of a shared sovereignty anyway.

2 Objectives and Methodology

2.1 Objectives

The main objective of this diploma thesis is to estimate the economic impact of the common European currency euro on the Czech economy after its adoption as a main and single monetary unit in the Czech Republic. The euro might replace the Czech koruna in next several (or more) years and the adoption of the second most important world currency will bring some advantages as well as some disadvantages which will also be described in this thesis. At the end of this thesis will be tried to also answer the question whether the euro adoption will be from the long-term period somehow beneficial or not and under which conditions would be the best moment to potentially adopt the common European currency.

During the theoretical part will be the main goal the attempt for a short description of the early economic and monetary cooperation in Europe followed by the historical development of the common European currency within the Economic and Monetary Union. The brief history of the euro development will be beneficial in understanding the general knowledge of the euro question.

2.2 Methodology

The main task of the theoretical part took the literature overview which is for this topic important. The information which were considered as useful will be subsequently put into the suitable form in order to write this thesis. All the sources are listed in the bibliography section at the end of this thesis.

The useful and significant data from the Statistical Office of the European Communities (EUROSTAT) will be used in the whole study. These data and all the charts and tables will be analysed in assistance with the table software Microsoft Excel. The analysis is mostly based on comparative method of the data which are available online.

In the first part of the analysed section will be the evaluation of the current convergence criteria fulfilment by the Czech Republic. The data of the evolution of Inflation, the government debt, values of exchange rate and the values of long-term interest rates will be taken for the period of 6 years since 2005 until 2010 except the data of exchange rates which will be analysed for 2.5 years long period since 2009 until mid 2011. In all that cases will be shown the value of the criterion which is necessary to achieve to be successful in that particular criterion. The exchange rate criterion fulfilment will be illustrated only in theoretical level because the Czech Republic does not participate in the ERM II which is a formal condition to fulfil this criterion.

The parts where the expected impacts on the Czech economy are analysed are divided in to the parts of economic growth, inflation and international trade. All the data from these parts are compared with the data of some euro area economies which are somehow similar to the Czech one and during the period when these economies became a part of the common currency area. Mostly the data are compared with the Portuguese economic results because the level of the Portuguese economic development is quite similar to the Czech one. But in some cases is the comparison showed with other small euro area countries but never with the big economic performers such as Germany of France in order to keep the comparability.

The data are mostly shown in percentage change on previous year and in two cases is used the comparable form of purchasing power standard in percentages which is the artificial currency unit in which the PPPs and real final expenditures for the EU 27 are expressed. The data set illustrates the evolution of the GDP growth since 1996 until 2010 and the unemployment rate since 1998 until 2010. The data for other indicators will be shown around the years when the euro became the only monetary unit in the euro area thus then could be possible to compare. To express the relation between the economic development level and comparative price level for the whole European Union will be calculated the regression analysis and for the purpose to quantify the mutual dependence will be used the Pearson correlation coefficient. The statistical verification will be calculated with a Student t distribution test.

3 Historical Evolution of the Common European Currency

3.1 Beginnings of the Economic and Monetary Cooperation

3.1.1 Early monetary cooperation in Europe

The first mention about economic and monetary policy coordination of the member states is already written in the Treaty establishing the European Economic Community (articles 103 – 109) also known as a the Treaty of Rome from 1957. Each member state shall pursue the economic policy needed to ensure the equilibrium of its overall balance of payments and to maintain confidence in its currency, while taking care to ensure a high level of employment and a stable level of prices (Treaty of Rome, article 104).

Generally there was possible to identify two main conceptions of creating economic and monetary cooperation at that time. Fiala and Pitrová (2010) named these two conceptions as a "monetarist" and an "economist" one. Both conceptions differ from each other mainly the way how to initiate the common currency and the succession of each steps. Monetarists strived for a quick installation of common currency which by their opinion will positively influence the convergence of the participants' economies. On the other hand the economists supposed the basis of successful economic and monetary union (EMU) project is possible after the participants' economies will be thrown enough together and the common currency installation will be possible at the very end of this process.

The followers of EMU pointed mainly out the concrete benefits of this economic and monetary project for the whole European community such as the costs savings in amount of 0.4% community's GDP which arose due to the movement of some currencies within the common market area. These costs had been caused mainly by transactions expenses, currency conversions and the expenditures for an accounting administration in several currencies. They also assumed a significant money savings which would have normally been used for a risk coverage emerged by exchange rate fluctuation. The followers also expected a general moving facilitation of capital and investments and of course a threat reduction of currency

speculation attacks. From the international business relations viewpoint was the common currency adoption considered as a step forward to a greater economic stability because there was generally expected the common currency will take place as a reserve and transaction currency globally (Apel, 1998).

3.1.2 Barre Memorandum

On April 1964 the Council had decided on the establishment of a Medium-Term Economic Policy Committee which was to prepare "a preliminary draft of a medium term economic policy programme outlining in broad terms the economic policies which the member states and the institutions of the community intend to follow. But the committee did not come with any tangible results and no significant further action to deepen monetary integration was taken. In the monetary field, member states were occupied with international issues (in particular, the problem of the pound a dollar) and the reform of the international monetary system. Another factor might have been that France, under President Charles de Gaulle, was in general not very receptive to a deepening of European integration, which inevitably would have led to some loss of national sovereignty (Ungerer, 1997).

On February 12, 1969, the Commission presented to the Council a comprehensive memorandum "on the Co-ordination of Economic Policies and Monetary Co-operation within the Community" the so-called Barre Memorandum. This memorandum by Sutton (2007) proposed were the coordination and convergence of national economic policies and, secondly, the setting up of European Economic Community (EEC) machinery for monetary support. It also explicitly suggested that there should eventually be fixity of exchange rates within the EEC, in the sense of the elimination, for the currencies of the member states, of day-to-day fluctuations around the parities. This fixity would have represented a loose form of monetary union, without a single currency or even a parallel common one.

According to Fiala and Pitrová (2010) Barre Memorandum warned about a direct cohesion of the current common policies with the EMU conception and mainly about a common agricultural policy. Among other things Barre Memorandum also interconnected the integration problem with planned enlargement of the community to a Northern Europe.

Ungerer (1997) also adds this Memorandum repeated the number of proposals that failed to trigger any action. It underlined the interdependence of economic development in European community countries. By him the resulting problems could not have been solved by a single economic policy, because the necessary preconditions did not yet exist at that time, or by mere juxtaposition of independent national policies. The commission called for the compatibility of medium-term economic objectives but underlined that agreement on medium-term guidelines would not suffice unless member states pursued joint short-term economic policies consistent with these guidelines.

3.1.3 Werner Report

In 1969 the heads of states or Governments requested a plan for the realisation of an economic and monetary union. The result was the Werner Report published in 1970, and that proposed to achieve economic and monetary union in several stages by 1980.

The Werner Report prescribed three main elements for monetary union: a. "Within the area of a monetary union, currencies must be fully and irreversibly convertible, fluctuation margins around exchange rates must be eliminated, par values irrevocably fixed, and capital movements completely free." b. "It is of primary importance that the main decisions regarding monetary policy be centralized, whether such decisions concern liquidity, interest rates, intervention on the exchange markets, management of reserves, or the fixing of currency parities vis-à-vis the rest of the world." and c. "Under such a system, national currencies could be maintained, or a single Community currency could be created (Mongelli, 2008).

Magnusson and Strath (2001) also add under the Werner EMU common policies were to be subject to debate and control by the European Parliament. The coordination of the central banks were to be subject to politically determined growth and stability targets. The Council was to decide the main important economic issues of economic policy at community level, after consultation with the partners from the Economic and Social Committee. Similarly the Werner Plan's project for an EMU as formulated in March 1970 no doubt envisaged a clear political control over economic and monetary issues and a transfer of national power to the community level.

Although the Werner Report had never been thrown down the table completely, it had become outmoded for a while due to the unfavourable foreign circumstances such as the Bretton-Woods collapse or the beginning of an oil crisis which increased the inflation rate all over the Europe. The politicians' attention had been focused on the different problems at that time and that is why there was no interest to continue in any project similar to monetary union in Europe and that is why since 1974 the Werner Plan was considered to be a failure.

3.1.4 European Common Margins Arrangements

In March 1971, the Council of Ministers approved the strategy proposed by the Werner Report and took steps to implement some of its recommendations. That proposal known as the "Snake in the Tunnel" Kenen (1995) described as follows: Exchange rate fluctuations were reduced by limiting the swings in bilateral exchange rates to a 2.25% band. This arrangement was known as the "snake in the tunnel" because it made the participating currencies move up and down together within the wider 4.5% band established for the dollar by the Smithsonian Agreement of 1971. But the worldwide shift to floating exchange rate in March 1973 abolished the tunnel, allowing the snake to undulate freely and making it more costly for some countries to participate. They began to drop away, letting their currencies float independently.

3.1.5 Decay of a Bretton-Woods system

The Bretton-Woods system (1944 – 1971) was a fixed exchange rate system designed to stabilize values of the major Western European countries against each other. It was in effect an agreement that government should intervene in the foreign exchange markets to ensure that currencies were kept within predetermined exchange rate "bands". The assumption behind this strategy was that fixed exchange rates – because they stabilize the prices of exports for all participant countries – promote international trade and therefore economic growth. Bretton-Woods system was a signal that the lessons of the Great Depression (1929 – 1933) – when sever currency turbulence had been associated with a

dramatic collapse in world trade, a slump in a world output and rising unemployment almost everywhere – had been learned (Mulhearn, Vane, 2008)

This system worked until the half of 70s' only. Constant depreciation of American dollar, increasing American inflation which reached double digit value at that time, different economic growth and undervalued European currencies forced European countries to permanent devaluations own currencies. Under the pressure of all these circumstances had became the Bretton-Woods system completely unsustainable therefore European countries started to get off gradually and switched over the floating exchange rate against the American dollar with own currencies.

Right after the first stage when Werner plan had been launched Richard Nixon, as the American president at that time, announced on 15th August 1971 a repeal of the dollar convertibility. During 17th – 23rd August a closing down of the foreign currency market followed. The decay of the Bretton-Woods system and a return to the floating exchange rate meant for the European community a necessity to solve the problem with dispatch about the European monetary stability (Fiala and Pitrová, 2010).

3.2 European Monetary System

At the end of 70s' the European community (EC) still had an issue to stabilize the exchange rates and support by this the creation of a common market which was the core effort of the integration process. Therefore they agreed that closer monetary cooperation between EC countries should be promoted through the creation of the European Monetary System (EMS). That idea had a big political support at that time across the EC. After two years the system should proceed to a second, final phase in which it would be given a more definite institutional framework, in particular through the creation of a European Monetary Fund.

The objective of EMS was to create "a zone of monetary stability in Europe" and the purpose of the EMS is to establish a greater measure of monetary stability in the community. It should be seen as a fundamental component of a more comprehensive strategy aimed at

lasting growth with stability, a progressive return to full employment, the harmonization of living standards and the lessening of regional disparities in the community. The EMS will facilitate the convergence of economic development and give fresh impetus to the process of European Union. The Council expected the EMS to have a stabilizing effect on international economic and monetary relations (Ungerer, Evans, Nyberg, 1983).

The main components of the EMS were the European Currency Unit (ECU) as the unit of account and the Exchanged-Rate Mechanism (ERM) which is a oscillation zone where the exchange rates of national currencies are kept.

3.2.1 European Currency Unit

The ECU is a basket-type currency. Each Member State of the Community is supposed to have a share in that basket that reflects its economic strength and to have included in it a specified quantity of its currency. The respective shares, or weights, were determined not only by reference to each country s gross domestic product, but also by reference to its participation in the Community s external trade and its quotas under the short-term monetary support system. Through inclusion of all Member States' currencies in the basket, it has been made clear that the ECU is intended to be more than a simple technical unit. Such a unit would more appropriately have been restricted to only a few currencies, making its value easy to calculate at any given moment. And it would probably have been an immutable, closed currency basket. The ECU basket, by contrast, is an open basket designed to receive the currencies of future Member States as well. It is intended to reflect the Community s membership. The national currency value of the ECU on any particular day can easily be calculated on the basis of the basket s composition. The amount of each currency in the basket has to be multiplied by its daily rate against a reference currency such as the dollar. The resulting nine amounts in one currency have then to be added together to give the value of the ECU in terms of that currency (European Communities - Commission, 1984).

Table no. 1: The composition of ECU at the time of inception

Currency	Real Amounts of Member States Currencies in 1 ECU	Individual Currencies' Percentage Shares in the ECU Basket
German mark	0.828	33.0
French franc	1.15	19.8
Dutch guilder	0.286	10.5
Belgian and Luxembourg francs	3.8	9.5
Italian lira	109.0	9.5
Danish krone	0.217	3.0
Irish pound	0.00759	1.1
Pound sterling	0.0885	13.6

Source: (Fiala, Pitrová : *Evropská unie*)

3.2.2 Exchange-Rate Mechanism

A basic purpose of this mechanism is the attempt for keeping the exchange rates among the community countries stable. Exchange-Rate Mechanism (ERM) determined for every single community currency a middle exchange rate against the ECU by which the whole network of reversible exchange rates was created. This system of stable exchange rates with customizable exchange rates was established by the decision of finance ministers and central bankers from the Community and Commission after the mutual agreement. The ERM obliged the central banks from the Community to permit own exchange rate fluctuation in a certain range only. This range tolerated feasible deviation ±2.25% during 1979 – 1993 with a chance of temporary range extension of ±6% particularly in case of countries with ongoing currency turbulences such as Italy, Spain, Great Britain and Portugal. The new fluctuation range of ±15% was accepted by so-called Brussels compromise which was accepted by Community central governors and finance ministers after the several EMS swings in August 1993. In case of exceeding the prescribed range the central banks had to intervene in a foreign exchange markets. This interventional obligation was not limited by any amount of disposable

money. If any central bank had not enough the required foreign currency, there was a help by a special credit system for such cases (Maryáš, Oháňková, 2006).

3.2.3 Importance and results of the European monetary system

During the first stage of the EMS, which is sometimes called as the consolidation period, had been the internal and external monetary stability strengthened, despite of the significant exchange rate fluctuation. The next stage of EMS was focused on convergence of the community's economic policies and ensuring the balanced and stable economic growth. The community's central banks started to cooperate closely during the interventions, interest rates policy and cash flow regulation within the economy. On the other hand EMS was never completely successful with the exchange rates fluctuation and consequential expensive devaluations.

Fiala and Pitrová (2010) also add that during the EMS existence a lot of repeated exits and entrances occurred due to the significant series of speculation attacks. The crisis culminated in August 1993 when the new rules about the permitted fluctuation range had been accepted. The new board for the fluctuation zone was extended from ±2.25% to ±15% which basically meant the transition from fixed and customizable exchange rate system to the floating exchange rate strategy. The multiple extension of the fluctuation zone together with the other consequences from the crisis such as the losses during the interventions opened the discussion about the real functionality of the EMS because this system namely was not able to prevent this incurred situation. The attention applied to the asymmetric inside the EMS mainly which was caused by a high share of German mark in the ECU basket[1].

The EMS de facto stopped its role in May 1998 after the mutual exchange rates fixation to the euro currency. Since 1.1.1999 the ERM 2 was established as a successor of ERM. The ECU had no longer performed its function and new common euro currency has become the anchor for the other community's currencies subsumed in the ERM 2.

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[1] cf. Table no. 1 on the page 13

3.3 Economic and Monetary Union

At that time of EMS differences in inflation rates across members of the ERM were as large as 10 percentage points. These inflation differentials made it difficult to maintain stability in the ERM since, with fixed exchange rates, differences in inflation translate directly into changes in relative prices, which shift competitiveness across countries.

How did the Community start to see the common currency after the increased problem with inflation explained economist from a Federal Reserve Bank of Boston Michael W. Klein (1998) as follows: Inflation rate differentials narrowed across Europe by the mid 1980s and by 1987 most capital controls were lifted. There were no further exchange rate realignments in the 1980s after 1986. Many observers thought Europe had entered a period of the "new EMS." The groundwork had been set, so it seemed, for a single European currency. The timing was opportune, since the Single European Act of 1986 called for removing all internal barriers to trade, capital movements, and labour migration within Europe rope by the end of 1992. The Single European Act was another step in the march toward European economic integration, which began with the Treaty of Rome in 1957. A single currency was viewed by some as crucial in this process.

3.3.1 Delors Report

The Delors Report gave an impetus to the creation of the EMU. It envisaged the EMU in three stages. Its wise approach was not to state any specific date apart from mid-1990 for the beginning of the first state. During the first stage, the member countries would strengthen the coordination of their economic and monetary policies. The removal of the remaining capital controls would require this in any case. All countries would enter the ERM of the EMS. Stage two would be marked by the creation of the European Central Bank (a system of central banks or a monetary authority). The major macroeconomic indicators would be set for all member countries including the size and financing of the budget deficit. In addition, the margins of fluctuation in the ERM would be narrowed. The first two stages would not be fully stable, as there would be the potential for speculative attacks. In the last stage of the creation

of the EMU, a common central bank would be the only authority responsible for the conduct of monetary policy throughout the EU. Exchange rates among the national currencies would be permanently fixed without any fluctuations. A single currency would emerge. It may be a necessary condition for a genuine single market where a national competitiveness would not be influenced by the individual alterations in exchange rates. This was the blueprint for the finalisation of the Maastricht Treaty (Jovanovič, 2005).

3.3.2 Economic and monetary integration

On February 7, 1992, the member states of the EC, at a summit in Maastricht in the Netherlands, adopted amendments to the Treaty of Rome by signing the Treaty of European Union. The new union, called the European Union (EU), was formed from the three existing communities, namely the European Coal and Steel Community, the European Atomic Energy Community and the European Community. According to Nugent (2006) the Maastricht Treaty which created EU was to be based on three pillars: the European Communities, a Common Foreign and Security Policy and Cooperation in the Fields of Justice and Home Affairs. Pillar one meant amending the Treaties of the three European Communities and in the cases of pillars two and three meant laying down guiding principles and operating rules.

The Maastricht Treaty created the legal framework of EMU and its common currency. This treaty contains the schedule of EMU realization, the contents of each phase and the conditions for the participation of the Community countries in the final stage of EMU creation, so-called Maastricht convergence criteria (see paragraph 3.3.3). The Maastricht Treaty determined the three phases plan to successful realization of Economic and Monetary union (see Appendix 1).

1st Phase (1990 – 1993)

The first phase was launched according to the proposition of the Delors Report. In the economical part of a whole process the integrated internal market was realized and the free movement of the products, people, capital and services had been completed. In this respect the free movement of capital mainly was a key step for a future formation of monetary union.

Budgetary were strengthen the instruments for the economic and social cohesion policy (the structural funds mainly) in order to significantly decrease the regional disparities within the EU. Another element of the first phase was the coordination of the budget policies in the Community. This coordination should have removed the obstacles which might have restrain from achieving the common convergence target of the basic macroeconomic indicators in the Community (Sychra, 2009).

Maryáš and Oháňková (2006) also say the closer cooperation of the Community's central governors committee began, integration of all the member countries into the European monetary system occurred and the legal framework of EMU in Maastricht Treaty was embedded. The main objective was to realize the internal market concept and in the monetary section was the main effort to integrate all the currencies of the Community countries into the Exchange-Rate mechanism preferably and remove all the exceptions. The central governors committee did not specify the fixed terms for a start of the second and third phase of economic and monetary integration. The transition among the particular phases should have been dependent on the real convergence criteria fulfilment.

2nd Phase (1994 – 1998)

The second phase was the most important as well as the most challenging phase of the transition to the EMU. It created the institutional, economical and legal conditions for the common currency adoption because with the beginning of the third phase the EMU has already been created. At the beginning of this phase the European monetary institute (EMI) started to work as an institutional forerunner of the European central bank (ECB) but at the end of the second phase this institute ceased to exist. EMI coordinated the monetary policy and started to create the European system of central banks (ESCB) as well. The Commission, as a key authority in the process of monetary union realization, announced in 1995 so-called a "Green Paper on the practical arrangements for the introduction of the single currency" which contained the detailed steps to a common currency adoption (Lacina et al., 2007).

About the Green Paper talk Fiala and Pitrová (2010) as a paper where the technical aspects of the new currency adoption were outlined. The Commission proposed the common

currency adoption should have been continual in order to achieve the cost savings and maximize the support from the banks, business units and public. The commission assumed the new currency will became the transaction currency of the central banks firstly, then will be continually used for the cashless transactions and right after will be physically released as a money circulation. The coins and notes proposal came out during the first stage of a whole transition process.

Fiala and Pitrová (2010) also mention the problem about a delay of the third EMU phase. Instead of the primal idea of the third phase beginning in 1997, the third phase started in 1999 when the "automatic starting" was previously planned. This situation happed just from the reason that member states were not able to fulfil the convergence criteria, especially the government budgetary position. Hence the member countries differed in their opinion whether the convergence criteria should have been looked into as an unexceptionable point in the EMU creation process or just the schematic direction of the future evolution. Germany insisted for instance to fulfil the convergence criteria without any exception and even proposed their tightening in order to ensure the stability of the new common currency. Contrariwise the Commission proposed not to see the criteria that strictly. However this issue figured out the European summit in Madrid in 1995 where the previous plan of EMU realization was confirmed and was decided that those countries which will not be a part of the selection for the EMU joining in 1998 will join the EMU right after they successfully fulfil the convergence criteria. There was also chosen a new name "Euro" for the future common currency.

In 1997 during the Council meeting in Amsterdam was approved the Stability and Growth Pact. The meaning of this instrument was to find out which countries do fulfil fiscal criteria after the joining the EMU. The agreement did not include any requisite mechanism which could force the member state which started to turn away from the achieved convergence level to behave again responsibly with its fiscal policy to keep stability and consolidation. This problem was solved by the option to give a financial penalty in case the violation the admissible budget (Sychra, 2009).

On the other hand Lacina et al. (2007) talk about the disadvantages which the Stability and Growth Pact brings. Among the most accentuated ones are the procedural softness, inappropriate character of the sanctions and overall consensus about a fact the sanction will be given in an extreme case only. The Pact was also criticised for the fact that contains just a "stick" but no "carrot" as a reward. In other words, for those countries which conscientiously keep the fiscal discipline, there are no explicit advantages afterwards. Experts also criticised the weak effect on economic growth and unemployment, the chance of manipulation and generally a low credibility or arbitrability of reference values such as 3% of allowed annual government deficit. Another disputable point is the existence of a financial punishment as the sanctions respectively. The point is if the certain country has a problem with own budget, then the sanction in amount of 0.5% of GDP will definitely not increase the fiscal stability.

3rd Phase (1999 – 2002)

Since 1999 started the third phase of the EMU creation which was the official start of EMU itself. The competences in monetary policy came into the Community level, the responsibility for the execution of the monetary policy took over the European system of central banks and European Central Bank. During the start of this phase were all the exchange rates in the Community fixed with the euro. Table no. 2 defines the exact values of this fixation. Since January 1, 2002, started the euro adoption physically with the exchange of current national currencies for euro currency (Sychra, 2009).

After the 2004 when the EU joined gradually another 12 countries from the Eastern Europe, the Eurozone joined subsequently 5 of them, Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009 and Estonia in 2011.

Table no. 2: The coefficients between the currencies of EMU countries and Euro at the time of adoption

Country	Currency	Coefficient
Ireland	IEP	0.787564
Germany	DEM	1.95583
The Netherlands	NLG	2.20371
Finland	FIM	5.94573
France	FRF	6.55957
Austria	ATS	13.7603
Belgium/Luxembourg	BEF/LUF	40.3399
Spain	ESP	166.386
Portugal	PTE	200.482
Greece	GRD	340.75
Italy	ITL	1936.27
Slovenia	SIT	239.64
Cyprus	CYP	0.585274
Malta	MTL	0.4293
Slovakia	SKK	30.126
Estonia	EEK	15.6466

Source: (Fiala, Pitrová : Evropská unie)

3.3.3 Maastricht criteria[2]

Besides preparing itself for a strong a performance as possible within EMU, each country must elaborate a strategy to meet the Maastricht criteria. These nominal convergence criteria consist of four conditions that must be assessed at a single point in time. The criteria are just the formal requirements which each country must fulfil. The criteria do not evaluate the candidate country whether its economy is completely prepared to join the Eurozone or not, it only gives general view based on the set of economic indicators which are basically easy to measure and are comparable with other European countries.

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[2] Protocol on the Convergence Criteria, Official Journal of the European Union

1. **Price stability criterion**

   The Member State concerned has a price performance that is sustainable and an average rate of inflation, observed over a period of one year before the examination, that does not exceed by more than 1,5 percentage points that of, at most, the three best performing Member States in terms of price stability. Inflation shall be measured by means of the consumer price index on a comparable basis, taking into account differences in national definitions

2. **Government budgetary position**

   A government budgetary position without a deficit that is excessive, i.e. the annual government deficit does not exceed 3% of GDP and the ratio of government debt to GDP is below 60%.

3. **Exchange rate criterion**

   The Member State concerned has respected the normal fluctuation margins provided for by the exchange-rate mechanism of the European Monetary System without severe tensions for at least the last two years before the examination. In particular, the Member State shall not have devalued its currency's bilateral central rate against the euro on its own initiative for the same period

4. **Long-term interest rate level**

   The Member State has had an average nominal long-term interest rate that does not exceed by more than 2 percentage points that of, at most, the three best-performing Member States in terms of price stability over a period of one year before the examination. Interest rates shall be measured on the basis of long-term government bonds or comparable securities, taking into account differences in national definitions

3.4 Euro Area and the Euro Currency

The most visible symbol of European integration, the euro was launched as a "virtual currency" on January 1st, 1999, followed by the introduction of banknotes and coins at the start of 2002. The euro area has expanded from its initial 11 members to 17 with the addition of Estonia in January 2011. Countries earn their way into the euro area through adopting the economic, monetary, and fiscal discipline necessary to comply with the required economic convergence criteria. After just a decade, the euro is already the world's second most important international currency, after the U.S. dollar. It is the second most actively traded currency in foreign exchange markets worldwide, and is used in more than one-third of all foreign exchange transactions. In 2004, euro-denominated international debt securities surpassed those of the U.S. dollar. The official use of the euro has increased, with the worldwide share of disclosed reserves denominated in euros rising from 18 percent in 1999 to more than 25 percent in 2007. Similarly, its role as an invoicing or settlement currency has increased to cover more than half of the euro area's external trade. A number of non-EU countries, notably EU candidate and neighbouring countries, invoice approximately 60 percent of their trade in euros (Smallwood, Hope, Stevenson, 2009).

The currency is also used in a further five European countries (Montenegro, Andorra, Monaco, San Marino and Vatican City) and the disputed territory of Kosovo. It is consequently used daily by some 332 million Europeans. Additionally, over 175 million people worldwide use currencies which are pegged to the euro, including more than 150 million people in Africa.

3.4.1 Monetary policy in the euro area

Monetary policy in the EMU will be conducted by the European System of Central Banks (ESCB), a federal organization constituted by the European Central Bank (ECB) and the members' national central banks. The former will be responsible for the design of monetary policy and the latter will implement it according to the ECB's guidelines and instructions. The primary target of the ESCB is clearly defined by the Maastricht Treaty to be

the maintenance of price stability. The ESCB is also to promote a smooth operation of the payments system and contribute to the prudential supervision of credit institutions and the stability of the financial system. Without prejudice to these targets, the ESCB is to provide support to the rest of the general policies of the Union. There is no reference to lender of last resort facilities. The ECB is empowered with the design and conduct of the EU-wide monetary policy but the responsibility for banking supervision is left with national authorities. In order to pursue these objectives the ECB will have the exclusive right to issue currency, manage the exchange reserves of the members' central banks, formulate the discount policy, set reserve requirements and conduct day-to-day foreign exchange intervention through open market operations. Finally, the participation of the EU in international monetary arrangements is left to the European Council which, after consulting the officials of the ECB, will reach final decisions (Mourmouras, Arghyrou, 2000).

According to Maier (2002) any country can be viewed as a monetary union between several regions. Within these regions of a country economic dispersion such as inflation differentials are typically smaller than between countries, due to the lack of barriers to mobility such as different languages. In the European monetary union one monetary policy applies to all member countries. However, in most cases not all countries will have the same inflation rate. European countries differ significantly in economic power and size. This means that inflation differentials within euro area may trigger unequal responses but European monetary policy cannot and should not attempt to take into account national or regional differences. Even in a situation where, say, half of the euro area countries suffers from relatively high inflation rates and the other half from deflation, European monetary policy still must focus on the euro area aggregate. But there is no alternative, as this would imply to make the judgment whether high inflation is worse than low inflation or vice versa and to define a whole set of "rules" to deal with such a situation.

The Eurosystem has at its disposal a set of monetary policy instruments; the Eurosystem conducts open market operations, offers standing facilities and requires credit institutions to hold minimum reserves on accounts with the Eurosystem (European Central Bank publication, 2011).

1) Open market operations play an important role in the monetary policy of the Eurosystem for the purposes of steering interest rates, managing the liquidity situation in the market and signalling the stance of monetary policy. Five types of instruments are available to the Eurosystem for the conduct of open market operations. The most important instrument is the reverse transaction (applicable on the basis of repurchase agreements or collateralized loans). The Eurosystem may also use outright transactions, the issuance of ECB debt certificates, foreign exchange swaps and the collection of fixed-term deposits. Open market operations are initiated by the ECB, which also decides on the instrument to be used and on the terms and conditions for its execution. They can be executed on the basis of standard tenders, quick tenders or bilateral procedures.

2) Standing facilities are aimed at providing and absorbing overnight liquidity, signal the general stance of monetary policy and bound overnight market interest rates.

3) The Eurosystem's minimum reserve system applies to credit institutions in the euro area and primarily pursues. The aims of stabilizing money market interest rates and creating (or enlarging) a structural liquidity shortage. The reserve requirement of each institution is determined in relation to elements of its balance sheet. In order to pursue the aim of stabilizing interest rates, the Eurosystem's minimum reserve system enables institutions to 12 make use of averaging provisions. Compliance with the reserve requirement is determined on the basis of the institutions' average daily reserve holdings over the maintenance period. Institutions' holdings of required reserves are remunerated at the rate of the Eurosystem's main refinancing operations.

3.4.2 Fiscal policy in the euro area

Eurozone represents a new historical development. For the first time has happened a number of sovereign countries have adopted a common currency while they retained their fiscal policy at the same time.

The EU has its own budget, which is independent of the public finances of member states. Between 1958 and 1970, the EU was financed through national contributions, but since April 1970 it has been financed almost exclusively from its own resources. The EU has no

tax-raising powers and its revenues are collected by member states. But states cannot withhold payment of these revenues, as the European Court of Justice has made clear. The budget is used to finance a wide range of policy commitments and activities. Although the Commission has responsibility for implementing the budget, about 85% of it is managed by member states. The EU's own resources comprise four components. Agricultural duties and sugar and isoglucose levies, customs duties, a proportion of national VAT and gross national income based contributions (Jones, 2001).

The opportunity to use the EU budget as a tool for realizing the stabilization functions is limited by the Amsterdam Treaty. *The revenue and expenditure shown in the budget shall be in balance* (article 268) what expels a cyclical use of this budgetary tool. The next article of the same treaty says: *Without prejudice to other revenue, the budget shall be financed wholly from own resources* (article 269). Thereunto the same article talks about the process of the eventual income side budget modification. *The Council, acting unanimously on a proposal from the Commission and after consulting the European Parliament, shall lay down provisions relating to the system of own resources of the Community, which it shall recommend to the Member States for adoption in accordance with their respective constitutional requirements.*(article 268). In other words this means the new income of the EU budget could not be accepted just by the approval in member countries. It subordinates to a time demanding ratification process in all member countries. Another restriction of the current EU budget is in its size because the limit is currently established only in amount of 1.12% of the gross national income (see Appendix 2).

Some arguments were put forward against the introduction of fiscal rules at the European level. It was noted that fiscal rules may have costs in terms of stabilization policies and may hamper the achievement of allocative and distributive objectives. It was also noted that excessively stringent rules may be counter-productive. If the Stability and Growth Pact leads to an unduly tight fiscal stance in one or more countries, pressure may mount on the European Central Bank to deliver a monetary offsetting. Otherwise, the credibility of the Pact may be endangered. However, the prevailing view in the policy debate was clearly in favour of the introduction of formal rules. It was argued that procedural or fiscal rules are necessary

because the factors that in recent decades have determined fiscal profligacy in several countries have not disappeared (Buti, Franco, 2005)

According to the European Council, compliance with the Stability and Growth Pact should be assessed considering the cyclical position of the economy. In practice Buti and Franco (2005) explained this problem as follows: EMU fiscal rules require that each member state choose a budgetary target in cyclically adjusted terms and let automatic stabilizers or discretionary action operate symmetrically around it. The lower this budget balance with respect to the 3 per cent threshold, the wider the margins for countercyclical policy without running the risk of an excessive deficit. Each member state must submit its budgetary targets officially in multiyear budgetary documents (stability programmes) and these documents are updated annually and are subject to a review by the European Commission aimed at assessing their consistency with EMU fiscal rules. Overall, the approach taken by the EU can be characterized as less flexible than solutions adopted in some federally structured countries.

4 Expected Impact of the Euro Adoption on the Czech Economy

4.1 Evaluation of the Convergence Criteria Fulfilment

4.1.1 Price stability criterion

Since 2005 the Czech Republic has fulfilled the price stability criterion almost during the whole period with only one and a half year long exception which started in 2008. This deviation was caused mainly by increasing the lower value added tax (VAT) rate from 5% to 9% and consequently the price rising of basic goods such as alimentary products and energy. At the same year also increased the consumption tax rate and a new ecological tax has been installed. Since 2009 the inflation rate started to decrease again back to an inflation target which was announced by Czech National Bank (CNB) in 2010 at the amount of 2%. But because of the insistent world economic recession the inflation rate almost reached the deflation zone in 2009. During 2010 and 2011 the inflation rate started to rise slowly again because the lower rate of VAT increased by 1 percentage point to 10% and the consumption tax for tobacco products, alcohol, beer and fuel has increased but this administrative operations did not influenced the successful fulfilment of the price stability criterion which the Czech Republic has fulfilled since fall 2009. This also illustrates the chart no. 1 where the red line represents the Czech monthly data of harmonized index of consumer prices with 12-month average rate of change and blue line represents the reference value of the price stability criterion as an arithmetic average of the 3 best performers from the EU. Table no. 3 shows the annual percentage change of inflation rates where the year 2005 is the basic one.

Table no. 3: Inflation rates

	2005	2006	2007	2008	2009	2010
Best 3 performing countries	1,0	1,4	1,3	2,6	0,0	0,9
Euro area	2,2	2,2	2,1	3,3	0,3	1,6
The Czech Republic	1,6	2,1	3,0	6,3	0,6	1,2

Source: http://epp.eurostat.ec.europa.eu

Chart no. 1: Inflation rate in comparison with the criterion value in (%)
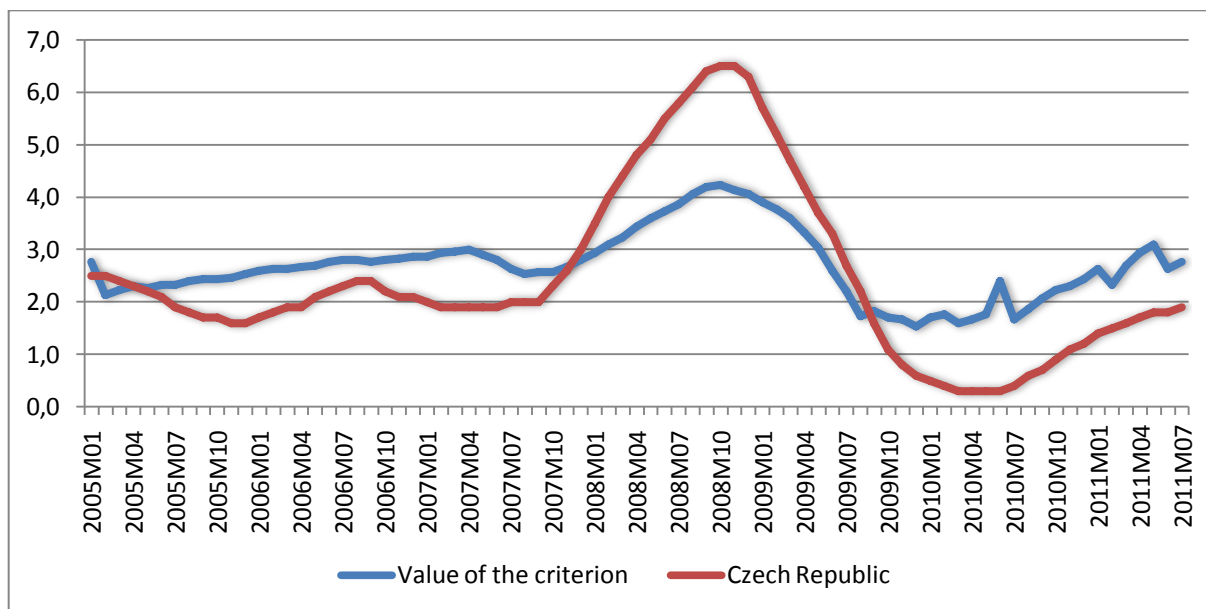
Source: Own elaboration based on the data from Eurostat

4.1.2 Government budgetary position

The criterion of the government budgetary position was fulfilled according to the allowed level of indebtedness since 2006 to 2008 only. Government expenditures before the election in 2006 were extremely high because of liberal social policy at that time, moreover during a sharp economic growth around 2005 and 2006 the government's debt policy was mainly to get into the debt even more and faster instead of paying back the public deficits. After the election in 2006 the new government cut the high social expenditures and pressed down the government annual indebtedness under the level of requested 3% from GDP (See table no. 4).

Table no. 4: Government annual deficit to GDP

	2005	2006	2007	2008	2009	2010
Euro area	-2,5	-1,4	-0,7	-2,0	-6,3	-6,0
The Czech Republic	-3,6	-2,6	-0,7	-2,7	-5,9	-4,7

Source: http://epp.eurostat.ec.europa.eu

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In consequence of a strong economy slowdown in 2008 followed by a big economic recession in 2009 the significant setback of the general government gross debt balance occurred. Beside of the unsolved structural problems of the Czech public finances the government sector faced the strong drop out of the tax earnings mainly influenced by extraordinary unfavourable economic development as well as the approved legislative changes on income and expense side of the public budgets. These legislative modifications had been ratified in order to reduce the economic recession impacts on a population and entrepreneurial subjects.

On the other hand even the deepening rate of government dept is very high the ratio of the government debt to GDP (see table no. 5) is still under the requested rate of 60%. But at the same time the new government, which came from the election in 2010, established the target of balanced government budget in 2016 which might to cure a bit the structural deficits. However there are several structural reforms which are necessary to ratified otherwise the balanced budget target will be impossible to reach.

Table no. 5: Ratio of government debt to GDP

	2005	2006	2007	2008	2009	2010
Euro area	70,0	68,4	66,2	69,9	79,3	85,1
Value of the criterion	60,0	60,0	60,0	60,0	60,0	60,0
The Czech Republic	29,7	29,4	29,0	30,0	35,3	38,5

Source: http://epp.eurostat.ec.europa.eu

Thus even the general government debt is under the requested 60% of GDP the deficit-to-GDP ratio is actually much higher than allowed 3% of annual GDP and that is why the Czech Republic does not fulfil the criterion on the government budgetary position.

The chart no 2 shows the average amount of the general government debt in the Czech Republic in comparison with the general indebtedness of the euro area countries and as is visible from that chart, the level of the debt in euro area countries is extremely higher than in case of the Czech republic.

Chart no. 2: Level of government indebtedness (in % to GDP)
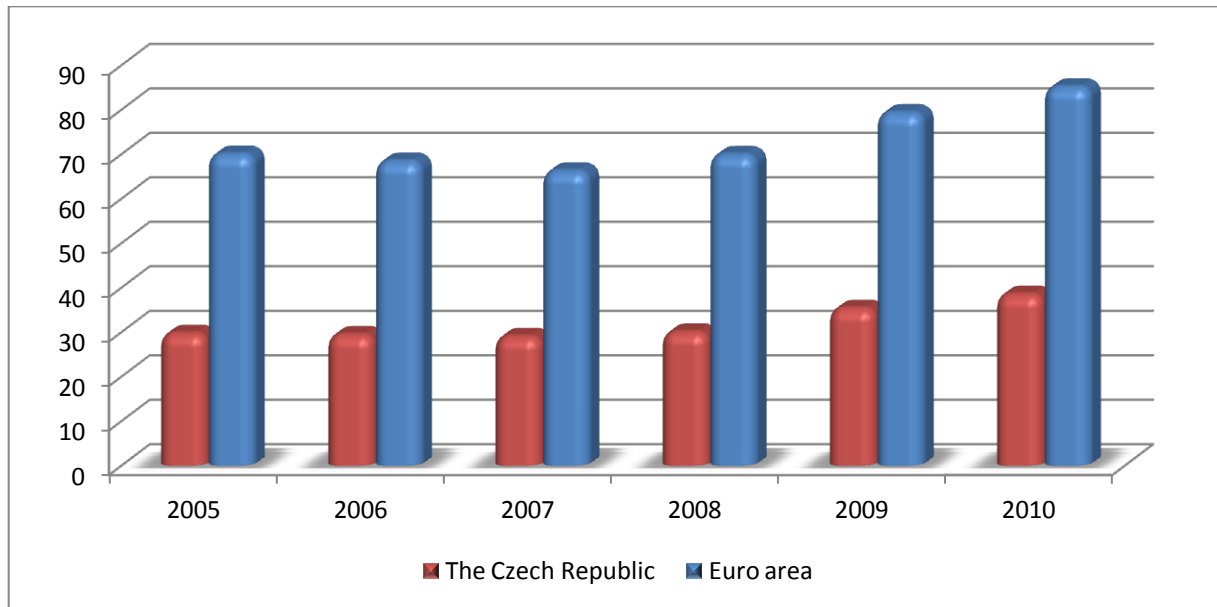
Source: Own elaboration based on the data from Eurostat

4.1.3 Exchange rate criterion

First of all, the Czech koruna is not participating in ERM II mechanism yet which is for candidate countries one of the essential condition to fulfill the exchange rate criterion. Candidate country has to be successfully part of this mechanism for two years at least. The Czech Republic operates a floating exchange rate regime and that is why the Czech Republic has not determined any central parity to euro exchange rate yet. The chart no. 3 illustrates a hypothetical central parity which was established for a purpose of an exchange rate stability evaluation in this thesis and is constructed at a value of the average exchange rates during the December 2008. According to that fictive central parity we can observe the Czech Republic would have been hypothetically able to fulfill the exchange rate criterion during the 2009 and 2010 and so on. For the future successful fulfillment of the exchange rate criteria will be extremely important the right timing of the ERM II joining because as is visible from the same chart at the very beginning of the observed period the Czech koruna exchange rate started to depreciate extremely sharply and then almost reached the 15% board.

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Chart no. 3: Exchange rate development of EUR/CZE

4.1.4 Long-term interest rate level

**Table no. 6: Long-term interest rate EMU convergence criterion series**

	2005	2006	2007	2008	2009	2010
Best 3 performing countries	3,4	3,8	4,2	4,1	3,4	2,9
Euro area	3,4	3,8	4,3	4,3	3,8	3,6
Value of the criterion	5,4	5,8	6,3	6,3	5,8	5,6
The Czech Republic	3,5	3,8	4,3	4,6	4,8	3,9

Long-term interest rates in the Czech Republic used for the convergence examination reflect secondary market yields of a basket of bonds with a residual maturity of around 10 years. The Czech 12-month moving average long-term interest rate relevant for the assessment of the Treaty criterion has stayed below the reference value over the entire assessment period (Chart no. 4). In 2010, the latest whole year for which data are available, the reference value, given by the average of long term interest rates in 3 best performing

countries plus 2 percentage points, stood at 5.6%. In that year, the twelve-month moving average of the yield on ten-year Czech benchmark bond stood at 3.9%, i.e. 1.7 percentage points below the reference value (see table no. 6) and that is why the Czech Republic fulfils the criterion on the convergence of long-term interest rates.

Chart no. 4: Long-term interest rate level in (%)
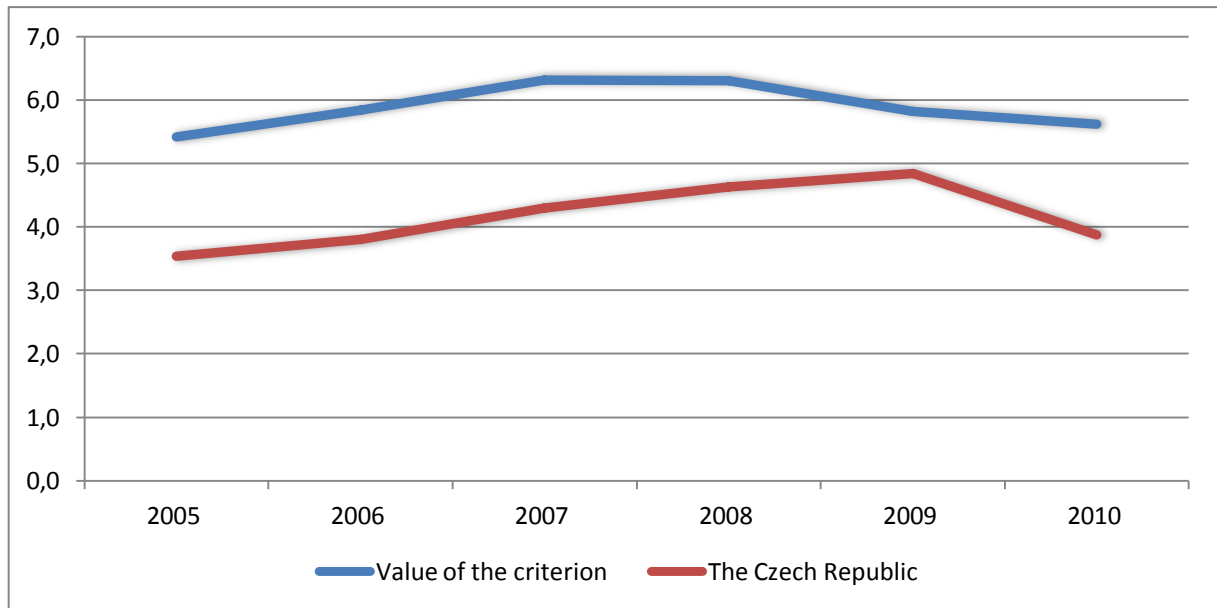
Source: Own elaboration based on the data from Eurostat

To conclude the evaluation of the convergence criteria fulfillment, first of all is necessary to point out the Czech Republic does not candidate to join the euro area yet and is not even going to do that in next few years, thus the fulfillment of all the convergence criteria works for orientation purposes only. The Czech Republic fulfills without any bigger problem the price stability criterion, the general government debt request and the long-term interest rate level. The deficit-to-GDP ratio currently the Czech Republic does not fulfill due to the unfavorable economic situation but the long-term outlook of this economic indicator is quite positive in case there will not occur any unexceptional economic circumstance. The exchange rate criterion the Czech Republic cannot fulfill because of non-participating within the ERM II.

4.2 Pros and Cons of the Euro Adoption

4.2.1 Advantages of the euro adoption

Exchange rate risk restraint

The exchange rate fluctuations influence all the subjects in economy which are in some way involved to financial transactions with the euro area countries. The firsts who usually lose certain amount of money during the long-term financial transaction are the companies which trade internationally. Firms are badly affected because of the time gap between the day when the business trade was signed and the day when the same trade was paid off. Of course the companies might secure themselves against the unfavourable exchange rate movement by any type of financial tools such as options for example. However this protection still increases their transaction costs. The others who are influenced by exchange rate movements are international investors, for those the unfavourable situation starts in opposite way than for the business subjects and we cannot forget the regular people who just change their savings into euro currency during their way to euro area.

The chart no. 3 shows the situation when the difference between the most appreciated level of the EUR/CZK rate and the most depreciated one counts 18.67%. It basically means the Czech koruna appreciated for CZK 5.51 in less than two years only which is enormous. On the other hand if the situation went in opposite way for most of the Czech subjects would have it been extremely positive but from the long-term viewpoint the Czech koruna appreciates steadily since euro inception.

Transaction expenses reduction

The transaction expenses we can define as financial and administrional. Financial expenses are connected with the exchange rate fees which everyone has to suffer during the currencies exchange process. It is quite hard to estimate a relevant volume of such exchange expenses within the economy but according to Lacina et al. (2008) the National Bank of Hungary solved this problem with the demand to commercial banks in order to manage a

comprehensive overview about all the foreign currency operations which the banks had done in length of one month. By this request the National Bank was able to estimate the amount of potential savings from financial transaction afterwards and the result was within an interval 0.11% – 0.22% of GDP.

The administrational transaction expenses are mostly the costs for accounting systems administration which allow processing the data in more than just one currency. There is not possible to expect whole elimination of all the administrational transaction expenses after the euro adopting because many of business subjects will trade in more than just one currency afterwards anyway but for those who are currently trading with subjects from euro area will be the saving of administration transaction expenses quite significant. However there are no proved data about the volume of transaction expenses, but Miroslav Singer, former vice governor of Czech National Bank and currently the governor of the same institution estimated (in Pečinková, 2007) the total transaction expenses in amount 0.5% of GDP.

Price transparency

Price transparency within the euro area market is ideally the biggest advantage especially for regular customers because by using this tool they can very easily compare the prices and then choose the best alternative. This fact should influence positively the competition in the euro area which should lead to convergence the services and consumer goods prices. However this could probably work in an unreal economic environment without any market limitations only. Standard European market as a whole could not ever work under this assumption because still there will be many limitation such as the distance between each countries, different tax systems, different labour conditions or the different national approach to consumption of certain goods such as food or clothes. But everyone will have at least a chance to easily know the price of certain good in another country. Also the real price transparency could be expected in long-term period and includes the ability from customers to find the price differences and even more to understand them in different languages. However the price transparency will be the permanent advantage for Czech customers, at the beginning it will have only a very small contribution.

4.2.2 Disadvantages of the Euro Adoption

Loss of own monetary policy

The central banks are used to use the tools of monetary policy such as the interest rates, money supply or exchange rate mainly to stabilize a macroeconomical environment of the given country. Decreasing the interest rate supports an economic growth by decreasing of the capital purchase costs as well as encourages an aggregate consumption. The currency devaluation as a monetary tool supports a competitiveness of the exporters since their products are in a short-term period cheaper against the products from the euro area. That is why the monetary tools are very important to help the economy during the recession. All the monetary tools are simply able to boost the economy.

After the euro adoption the Czech Republic will lose all the monetary tools completely and will have to accept the monetary policy of the euro system which will be given by European Central Bank (ECB) whose the Czech National Bank (CNB) will be a part of. The problems might arise during any economic recession which will not affect the euro area as a whole because in case only the Czech Republic will face any asymmetric economic shock e.g. the increased price level due to increased a value-added tax, the Czech Republic cannot expect the ECB will change any tool of monetary policy, which is adjusted for the whole euro area, just to solve our inflation problem. ECB watches just the aggregate economic values for the euro area as a whole and in case only a small part of the euro area would be somehow negatively affected the ECB cannot pay any special attention to that country. In that particular case the Czech Republic might hope in self-balanced market mechanisms firstly and then try to deal with economic problems by any tool of fiscal policy. Only problem in case of fiscal policy tools is to respect the Growth and Stability Pact which does not enable to run a far too expansive fiscal policy[3]. The limitation is the same as in case of Maastricht criteria which are expressed in 3.3.3 article above.

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[3] About this limitation could be hold a long discussion because many euro area countries did not respect this restriction for many years until the situation was not too critical like in case of actual European problems with Greece or Portugal

From all the reasons which were explained in articles above is not recommended to join the euro area until an adequate level of economic cycles consistence and the general economic structure with the euro area countries any candidate country has. The level of economic cycles consistence of the Czech Republic with the euro area countries is evaluated in the Expected Impact on the Economic Growth chapter.

Immediate increase of a price level

During the euro adoption in twelve EU countries in 2002 the prices did not increase dramatically. Eurostat counted in 2003 that on total inflation in euro area, which reached 2.3% at that time, the impact of euro adoption itself took part by 0.12% − 0.29% only but according to survey of public opinion people estimated a bit higher growth of prices than in reality was. The exchange of all the national currencies for the euro currency is controlled by certain rules. These rules allow rounding of prices for one euro cent only and prices must be calculated for euro by official conversion coefficient which will be defined by CNB and will contain 6 valid numbers (1 EUR = XX.XXXX CZK). According to euro area countries the growth of price level aroused by the euro adoption will have immediate cost for the Czech economy which will come out approximately half a year before the day of euro adoption itself and will happened during the following year. The prices could also rise after the end of obligatory dual prices period (Lacina et al., 2008).

4.3 Expected Impact on Economic Growth

The economic growth is measured by many indicators but the most frequent one is a GDP growth. The GDP indicator gives us not only the information about the performance of a given economy but in a long-term period shows the change of population's living standard. With increased economic performance people should be able to consume more goods and services because their income should rise and therefore the living standard will rise. According to Mankiw (2011) gross domestic product is the market value of all final goods and services produced within a certain country in a given period of time.

The impact on economic growth is really hard to estimate because there is just no experience with such a big change in history and every economy is more or less different and composed by different economic activities and therefore all the impacts estimation will be based on the euro adoption experience in other country with similar conditions.

For comparison the potential economic growth were chosen the economic results of Portugal because Portugal is quite small open economy like the Czech one and the level of economic growth during period of their euro adoption was more or less the same as the Czech level of economic growth now measured by GDP per capita in PPS. This fact shows the table no. 7 where the level of Czech and Portuguese economic development is around 80% - 82% of EU-27 during the monitored years.

Table no. 7: GDP per capita in PPS (EU-27 = 100) in percentage

	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Czech Republic	69	70	70	73	75	76	77	80	81	82	80
Portugal	81	80	80	79	77	79	79	79	78	80	81

Source: http://epp.eurostat.ec.europa.eu

Very interesting records achieved the Portuguese economy during the period after the euro adoption in 1999. This period is shown in the chart no. 5 where the red line illustrates the evolution of the Czech economy and the green line is the Portuguese one and is pointed out since 1999 the Portuguese economy started to constantly fall there and has never reached the economic results from the period before the common currency adoption. This was probably caused by a close economic convergence with the other most important European countries which were mostly in stagnation period at that time and the inception of the common currency in Europe did not press the European economy to reach higher growth rates neither. The Czech economy on the other hand rose constantly until the start of a global economic recession and during the peak rose for almost 7% of the annual GDP change.

Chart no. 5: Growth rate of GDP volume - percentage change on previous year
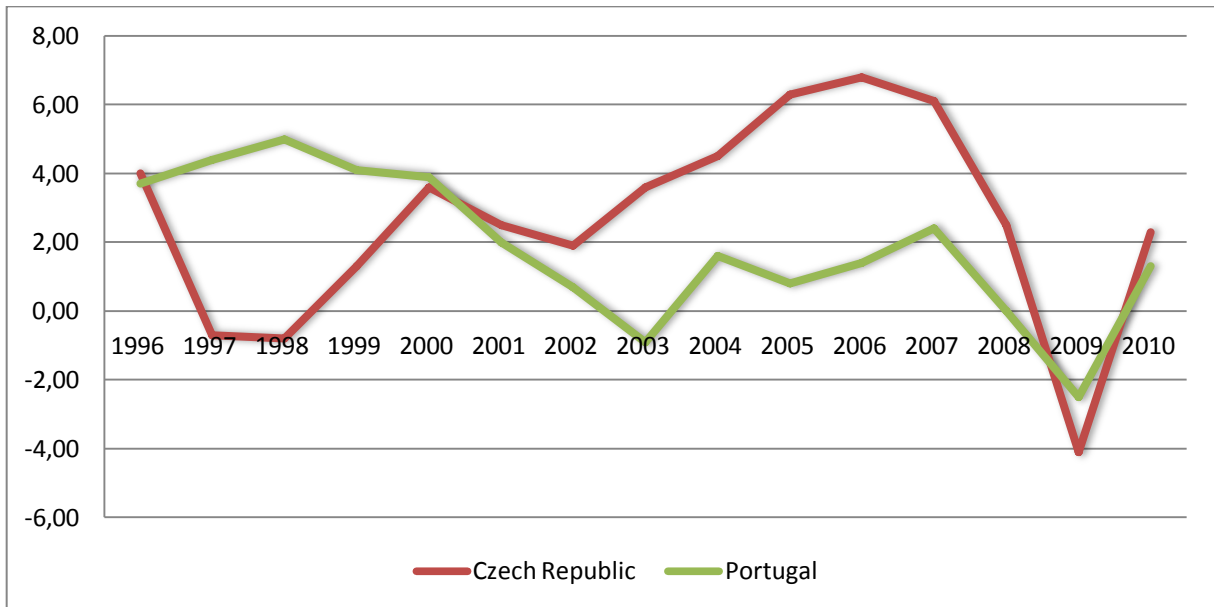
Source: Own elaboration based on the data from Eurostat

Another indicator how to measure the level of convergence is by a business cycle convergence. According to a theory of optimal currency area is higher the level of business cycle convergence then there is a lower chance to face the asymmetric shocks which are usually very costly afterwards. The chart no. 6 shows the annual evolution of GDP in the Czech Republic, euro area, Germany and Portugal. While the German and Portuguese GDP growth more or less copied the curve of GDP evolution of euro area, the Czech GDP curve showed much stronger product growth. This was mainly caused from a fact the German's GDP growth is like an engine of a whole European economy and we can also assumed the high convergence level even in Portuguese economy with the European one whereas the Czech economy growth and production is forced by a different business cycle.

Chart no. 6: Growth rate of GDP volume - percentage change on previous year
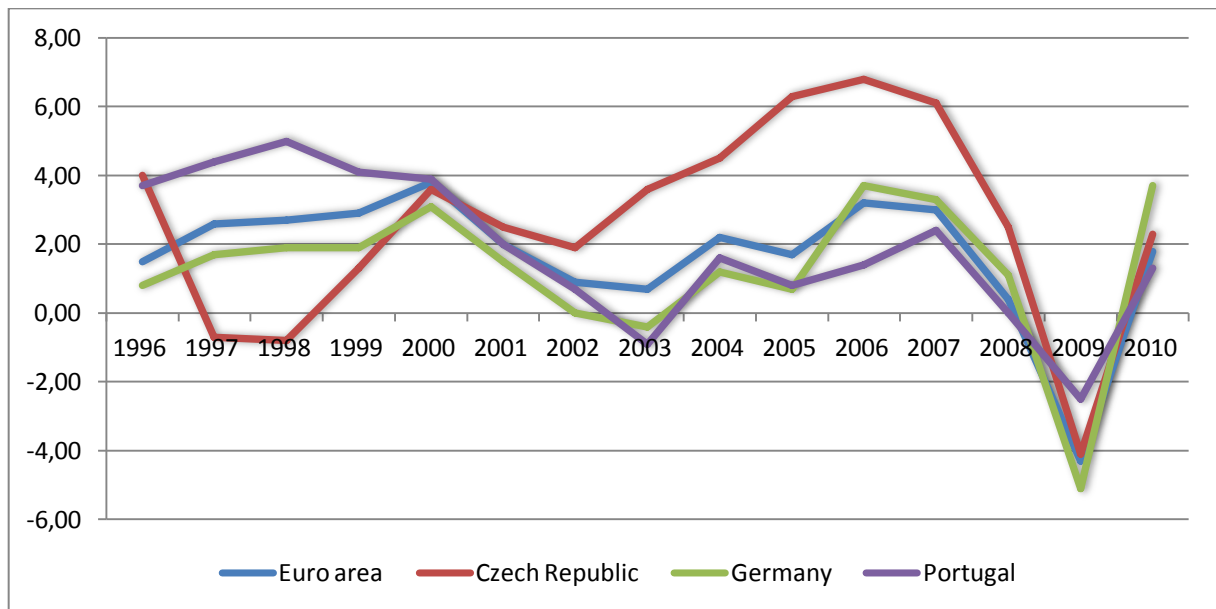
Source: Own elaboration based on the data from Eurostat

The level of business cycle convergence of the Czech and euro area economy was measured in this thesis by a Pearson correlation coefficient. The data for the calculation were used from the real GDP growth rate in the Czech Republic and in the euro area which shows the Table no. 8. According to that Pearson formula, where the range is [1;-1] 1 means strong dependence and -1 means anticorrelation, the correlation is 0.59 which by theory means strong dependence but in reality it shows a big business cycle difference. And again the chart no. 6 this confirms because in 1997 and 1998 there was a big slump in the Czech production growth and since 2002 until 2007 the Czech economy rose much stronger than the most economies in Europe. Almost the same result was reached during the calculation with quarterly data set. On the other hand if we take into account only the economic results from last 10 years only we would get much favourable and statistically more significant result which is 0.86. This significant increase of correlation or let's say business cycle convergence could be caused by last few years of economic results which are strongly influenced by an economic turmoil and followed by the economic recovery. The economic recession negatively affected the European economies as a whole thus influenced the calculated correlation

coefficient from last years. A predicative value of the calculated correlation coefficient from last years is very low then.

Table no. 8: Real GDP growth rate (percentage change on previous year)

The Czech Republic	1997	1998	1999	2000	2001	2002	2003
	-0,70	-0,80	1,30	3,60	2,50	1,90	3,60
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
	4,50	6,30	6,80	6,10	2,50	-4,10	2,30
Euro area	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
	2,60	2,70	2,90	3,80	2,00	0,90	0,70
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
	2,20	1,70	3,20	3,00	0,40	-4,30	1,80

Source: http://epp.eurostat.ec.europa.eu

Pearson correlation coefficient

$$r = \frac{\sum_{i=1}^{14}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{14}(x_i - \bar{x})^2 \ \sum_{i=1}^{14}(y_i - \bar{y})^2}} = \mathbf{0.59}$$

$$r = \frac{\sum_{i=1}^{10}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{10}(x_i - \bar{x})^2 \ \sum_{i=1}^{10}(y_i - \bar{y})^2}} = \mathbf{0.86}$$

Also Miroslav Singer, the Czech governor, agrees with the fact that Czech economic cycle is not converged enough with the European one. He pointed out (in Pečínková, 2007) the long-term interest rates of CNB differ from the rates of ECB quite a lot and surprisingly are very independent on the ECB's rates. In other words CNB takes into account during the decision making process about the interest rates actual economic information and cares for the optimal decision for the Czech economy. This fact the CNB still implements its monetary

policy independently on the monetary policy of ECB simply means the economic cycles of the Czech and European economy do not converge to each other.

This unfavourable conclusion about the economic convergence could be also seen as a result of a different structure of the Czech and European economy (see chart no. 7 and table no. 9) even with a high importance of a foreign trade with euro area for our economy. If the structure of both economies becomes closer there would be probably an assumption that a contribution of a single monetary policy for a performance of our economy would decrease in future.

Table no. 9: Structure of the Czech and euro area economy in %

	Agriculture and fishing	Industry	Wholesale and retail trade	Financial services and real estate	Public administration and community services
Euro area	1,7	24,5	20,5	29,3	24,1
The Czech Republic	2,4	37,7	24	18,4	17,5

Source: http://epp.eurostat.ec.europa.eu

Table no. 9 shows the structure of the Czech and euro area economy in percentage. The biggest structural difference between the Czech and euro area economy we can find in share of services segment generally and industrial part of each economy. The service segment in the euro area without a whole sale and retail trade is composed by more than 53% while in the Czech Republic it counts only 36% which is almost 1/5 difference in the economy output. On the other hand the significant dependence of the Czech economy is on industry which counts almost 38% compared to 24% share on euro area industry segment moreover only manufacturing in the Czech Republic counts with 24% the same amount as the whole percentage share of industry in euro area. Because of this fact that industry plays more important role in the Czech economy than in the euro area and that could be a potential threat for the Czech economy in future because within a single monetary policy the Czech economy will be more exposed to the asymmetric shocks in Europe. As an example of the potential asymmetric shock could be state the shock on a demand side in an automotive industry in

Europe whose the Czech economy is highly dependent on. In case the European consumers will decide to buy less new cars the potential threat for the Czech economy is much higher than for any other state. Those economies which are more developed are generally more service oriented than anything other.

**Chart no. 7: Structure of the Czech and euro area economy in 2010**
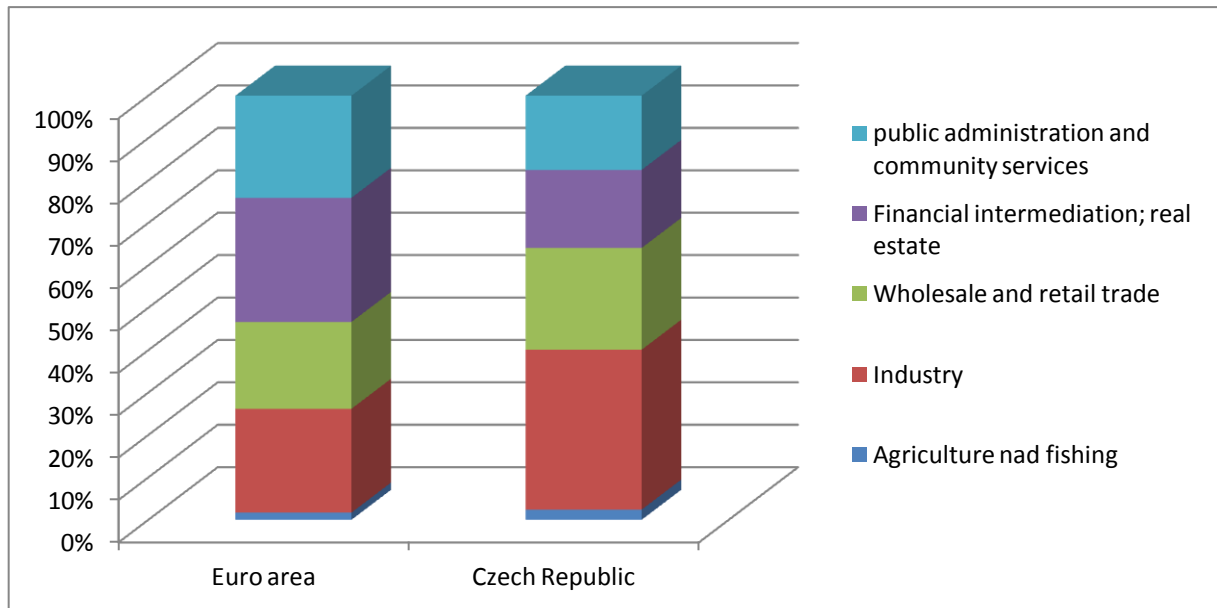
Source: Own elaboration based on the data from Eurostat

The chart no. 8 shows the evolution of unemployment rate in the Czech Republic (red line) and Portugal (blue line) and Ireland (violet line). As there is possible to see, Portuguese unemployment rate started to rise right after they adopted euro currency in 2001 and the Czech unemployment started to fall since the Czech Republic joined the European Union in 2004 until the start of economic turmoil in 2008. Both curves can be explained exactly according to Okun's law where an every increase in unemployment for one percent will decrease GDP around two percent. This calculation is just approximate but still the relationship between the GDP and unemployment definitely influences each other in both ways. But in this situation it is not possible to say the euro adoption negatively influences the unemployment because in case of Ireland their unemployment was completely stable since the date of euro adoption until the start of economic recession in 2008. The unemployment rate

and the factor of production growth such as a labour productivity have direct impact on a long-term economic growth and the living standard improvement.

Chart no. 8: Unemployment rate, annual average (%)
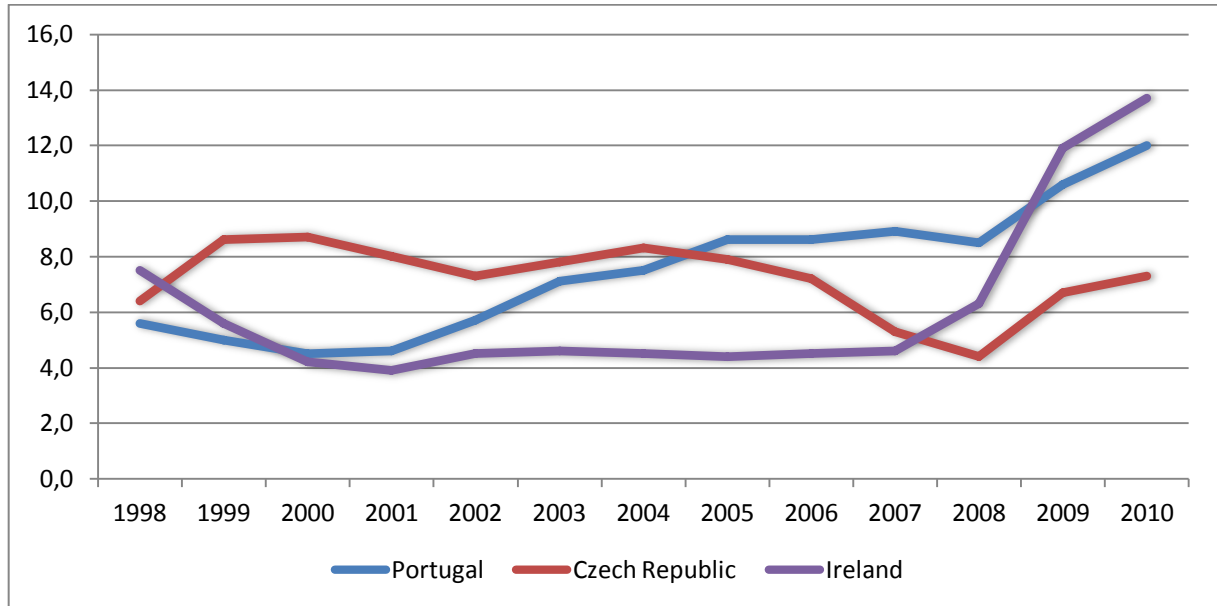
The euro adoption should have positive impact on more effective resource and production allocation among the Czech Republic and other countries the Czech Republic trades with as well as increasing the work productivity and investments and other factor which influence positively the long-term economic growth. This is conditioned by assumption the business cycles of the Czech Republic will become closer to Euro area one otherwise the Czech Republic may face the strong macroeconomical shocks which can damp the economy even worse.

4.3.1 Expected Impact on Inflation

The inflation is a problem for almost any economy in the world. The threat of inflation is that it devalues the savings of all the people and decrease the real income of employees. It also damages the financial plans of producers and business persons and creates the overall

uncertainty in the given economy. On the other hand the inflation is very positive for debtors because inflation decreases the value of their debts.

The main priority of all the central banks is to protect the economy against the unacceptably high inflation rate. The same goal have the Czech National Bank and the European Central Bank. In March 2007 the new inflation goal was announced in amount of 2% which become valid since 2010. The Czech National Bank will try to avoid the difference between the real inflation rate and the targeted one not to differ for more than one percentage point on both sides from the goal. Since the Czech Republic will adopt the common European currency, the Czech National Bank will not be able to react on the threat of increased inflation rate by its restrictive monetary policy because this function will be in charge of the European Central Bank. The problem of this situation is the increased inflation in few countries or regions of the euro area will not be solved by ECB because the effect of the ECB's monetary policy will take place in all the euro area countries even in those who will not face the increased inflation rate thus the ECB has to make the decisions on behalf of all the euro area countries together and therefore the protection policy against the increased inflation will be solved by any other alternative mechanisms such as the fiscal restrictive policy.

To estimate the expected impact of the euro adoption on inflation rate in the Czech Republic will help the analysis of the inflation rate evolution in other euro area countries during the period of their euro adoption. The chart no. 9 shows the evolution of inflation rate in Portugal and Belgium and the Great Britain as an example of non euro area country since 1997 until 2006. According to that chart the inflation rate started to rise since 1998 in both euro area countries until 2000 in Belgium and 2001 in the Portuguese case when the euro adoption worked in a whole Europe as a virtual currency but as shows the chart, the British inflation rate continued in an upward trend. This situation cannot be seen as a perfect proof of the decreasing inflation tendency in euro area countries but it is quite interesting to mention it at least. Right after these years and the real euro adoption in everyday life the inflation rate started to fall in all three countries. The absolute value of each inflation rate in every country was different but the falling trend was more or less the same there and what is even more interesting the inflation rate got coordinated around 2% in 2005 and 2006.

Chart no. 9: Annual data of inflation rate according to HICP (average index and rate of change)
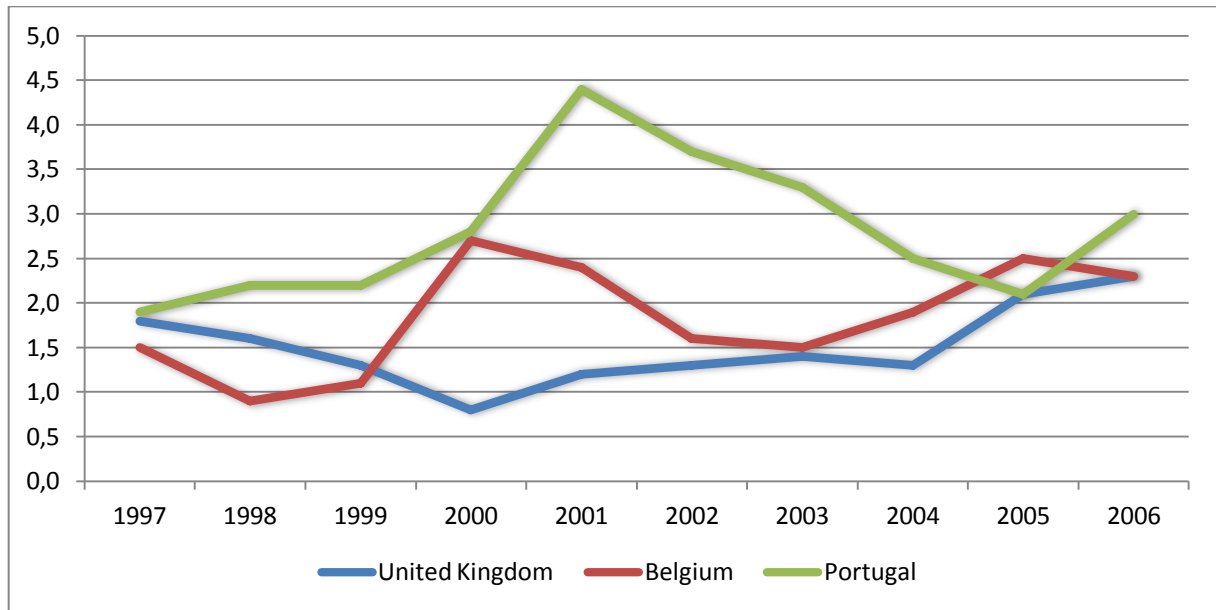
Source: Own elaboration based on the data from Eurostat

The chart no. 10 shows the quarterly data of inflation rate in Ireland, Greece and Portugal which was calculated from the 12-month average rate of change on food and non-alcoholic beverages. The price level change of these products, which are the Czech inhabitants very sensitive on, copied the annual inflation trend of a whole economy. Since the euro cash started to be a valid monetary unit, the inflation rate on food and non-alcoholic beverages started to fall in comparison with the previous period. This fact means that even the prices still slightly rose the rate of price rising was for 2% - 3% lower in only one year after the euro was adopted in euro area countries and the decreasing trend more or less followed until the end of 2004. This fact could be seen that the most important products were not that much negatively affected by euro adoption in smaller economies and the inflation rate did not drift the regular movement.

Chart no. 10: Quarterly data of inflation rate of food and non-alcoholic beverages according to HICP (12-month average rate of change)
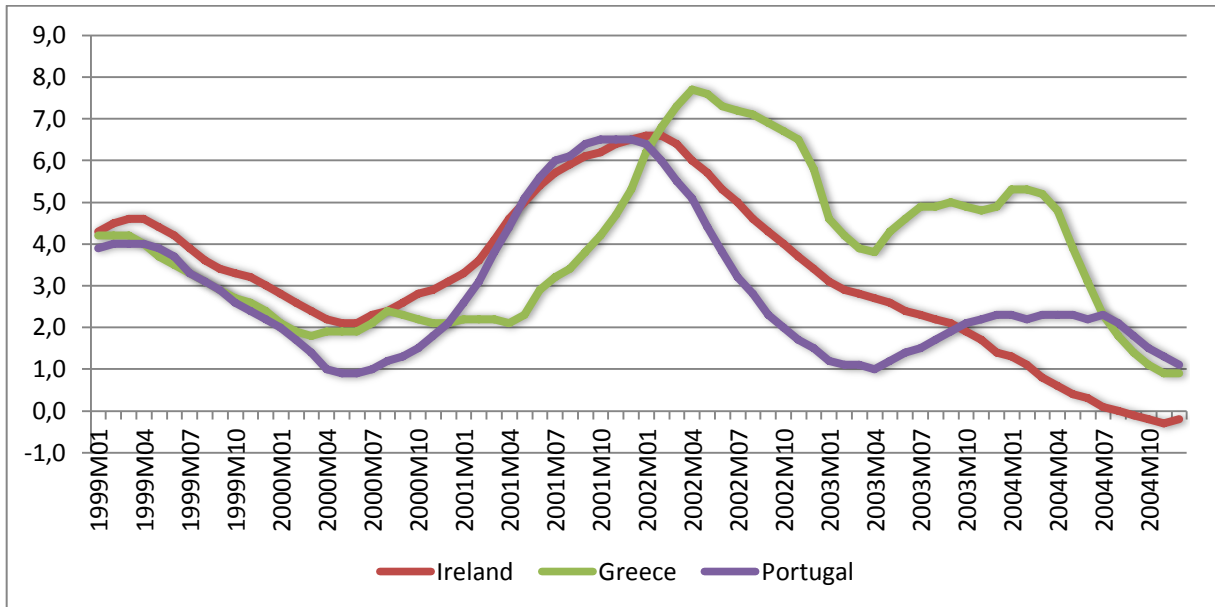
Source: Own elaboration based on the data from Eurostat

The chart no. 11 shows the quarterly 12-month average rate of change data of the beer prices only. Very interesting observation was realized that even the inflation rate of regular products started to fall after the euro cash and banknotes were put into a circulation, the price of beer, which is very important for the Czech citizens, started to rise more significantly than in the same period before. This situation did not happen in a whole euro area country but as an example the Greece, as a representative of a small and open economy, was chosen as well as Belgium which is also traditional country with high beer consumption as the Czech Republic is. In one and a half year long period after the euro started to be used by regular people the price of beer hit the peak in both countries and in case of Belgium reached more than 6% inflation increase in comparison with the previous period which is extreme for such a commodity which is consumed that frequently. Czech citizens are very sensitive for any price increase in case of beer but on the other hand there is a question whether the Czech breweries could effort such a significant price increase in such specific beer market, even the commodities necessary for brewing would get rise.

Chart no. 11: Quarterly data of inflation rate of beer according to HICP (12-month average rate of change)
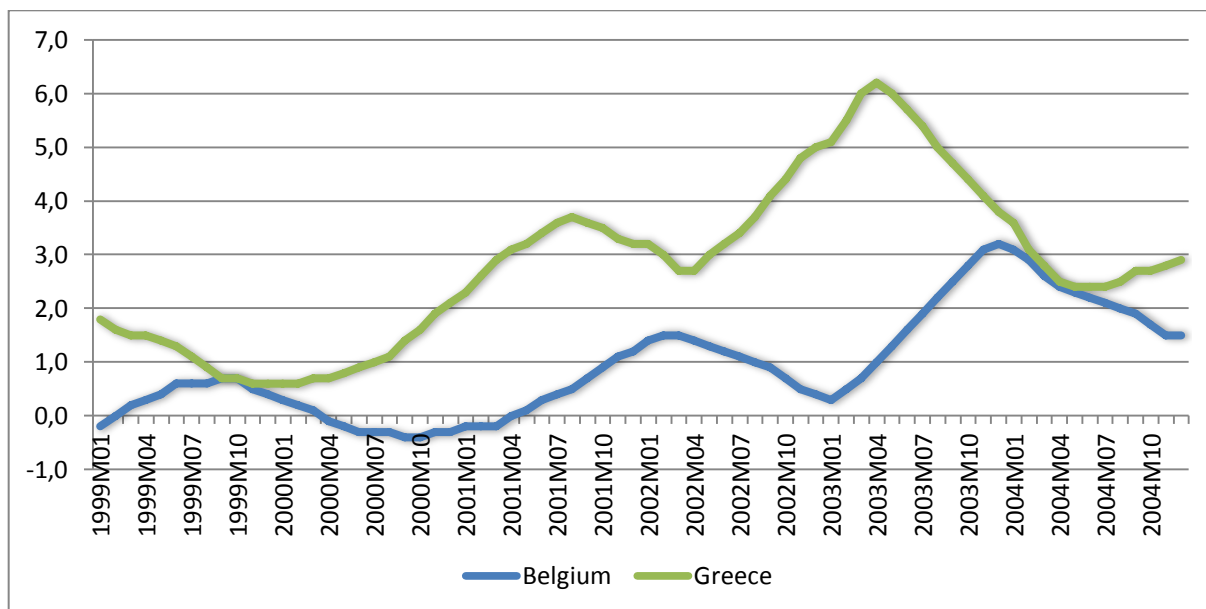
Source: Own elaboration based on the data from Eurostat

More than five years after the introduction of euro banknotes and coins, polls reveal a widespread perception that the euro has led to higher inflation which illustrates the chart no. 12. In a Eurobarometer poll[4] of autumn 2006, more than 90% of respondents in the euro area considered that the euro had added to the increase of prices in the past 5 years. This feeling of accelerated price increases persists despite the fact that inflation since the creation of the euro in 1999, or since the introduction of euro banknotes and coins in 2002, has not been that much higher than before. The prices of some goods and services did increase more strongly around the date of the euro cash changeover especially the prices of basic goods like food. The impact on the overall HICP price index was, however, only small and temporary.

For that problem have Döhring and Mordonu (2007) four explanations. Firstly, products which saw strong price increases at some point in time may be particularly important for the perception of price developments in general. Secondly, households whose consumption differs from the average HICP basket may have experienced a different pace and

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[4] Analytical report: The eurozone, 5 years after the introduction of euro coins and banknotes, available on: http://ec.europa.eu/public_opinion/flash/fl193_en.pdf

magnitude of price increases. Thirdly, the feeling that life has become more expensive might be influenced by the development of households' disposable income in the past few years. Fourthly, inflation perceptions may have been blurred by expectations of price increases, the complexity of the conversion rate from national currency to euro, extensive media coverage of price developments or by the way people compare current euro prices with prices of 2001 in national currency.

Chart no. 12: Actual and perceived inflation in the euro area
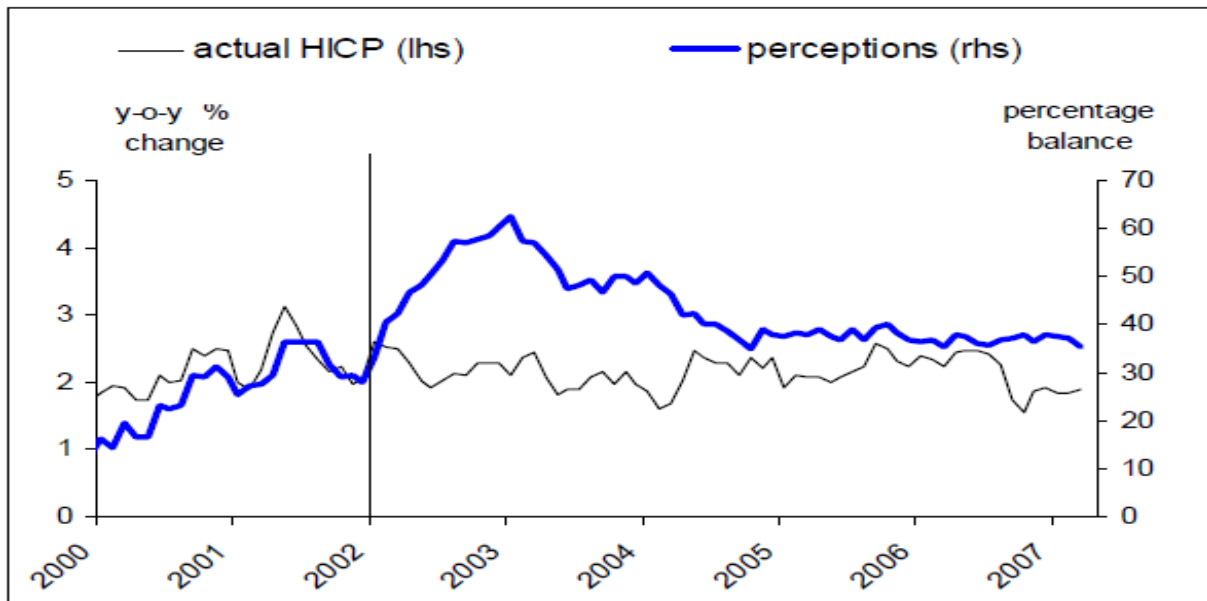
Source: European Commission (2007)

A comparison between the level of economic development, expressed by GDP in Purchasing Power Standard (PPS), and the price level was firstly calculated by Pearson Correlation Coefficient which gave us the result 0.92. That result shows very strong mutual correlation between these two indicators and subsequently by the regression analysis was calculated the regression line. According to a very high coefficient of determination ($R^2 = 0.8556$) which give us with 85.56% reliability the most valuable result thus the linear regression line was chosen for the purpose of this analysis. Linear regression line also fits the assumption that bigger the public wealth is, the prices of all products will be

higher and therefore the comparative price level will be in reality higher. That illustrates the chart no. 13.

$$r = \frac{\sum_{i=1}^{26}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{26}(x_i - \bar{x})^2\ \sum_{i=1}^{26}(y_i - \bar{y})^2}} = \textbf{0.92}$$

Regression analysis

$$b = \frac{n\sum x_i y_i - (\sum x_i)(\sum y_i)}{n\sum x_i^2 - (\sum x_i)^2}$$

$$b = \frac{26 * 232483.8 - (2368.4)(2387)}{26 * 238537 - 5697769}$$

b = 0.7759

$$a = \bar{y} - b\bar{x}$$

a = 236.84 – 0.7759 * 238.7

a = 19.8587

Equation of the Regression Line

y = 0.7759x + 19.8587

In case the GDP in PPS would reach 0, the comparative price level would reach the value of 19.86 and with every increase of GDP in PPS for 1 unit, the comparative price level would increase for 0.7759.

From that chart you can see the Czech Republic is situated under the level of regression line which means the Czech Republic belongs to the group of countries whose price level is relatively undervalued to the certain level of economic development. This basically means the living standard of Czech inhabitants is relatively higher in comparison with the theoretical price level (measured by a value of real wealth for one inhabitant). But it also shows that still there is a room for the potential price increase in future.

Chart no. 13: Economic development level in PPS and comparative price level in the euro area (EU27 = 100)
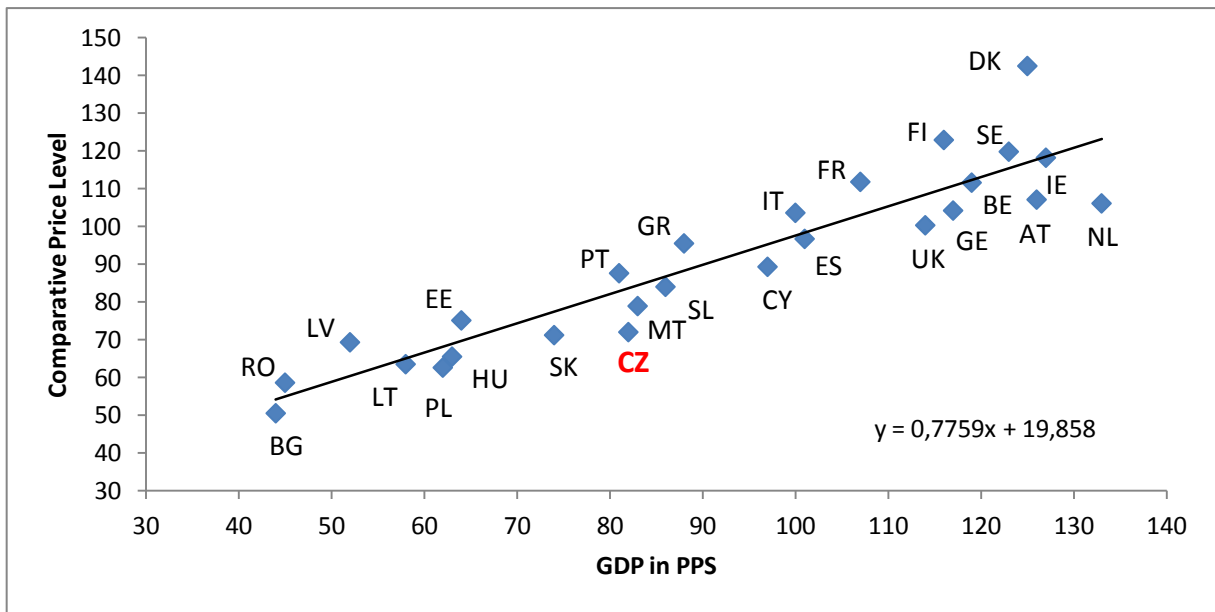
Source: Own elaboration based on the data from Eurostat

The convergence of the price level of candidates and euro area countries happens in two different ways. The first way how to reach the price level of the euro area is by increasing domestic inflation rate and the second way allows the price convergence process through the exchange rate appreciation. In reality the price convergence means the decreasing price difference between two exactly same products after the exchange rate conversion. With faster

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GDP growth, what in other word means faster growth of the real income, and gradual price level convergence the purchasing power of all inhabitants rise in developing economy. In the Czech Republic the price level convergence with the euro area economies currently works by exchange rate appreciation mainly but right after the Czech Republic will join the euro area the price convergence will work by growth of the price level only.

Statistical Verification

$S_y = \sum(y_i - \bar{y})^2 = 13645.04$

$S_T = \sum(a + bx_i - \bar{y})^2 = 11674.41$

$S_R = \sum(y_i - a + bx_i)^2 = 1970.35$

Coefficient of Determination $\qquad R^2 = \dfrac{S_T}{S_Y} = \textbf{0.8556}$

H_0: There is no dependence of the comparative price level on the GDP

H_1: There is some dependence of the comparative price level on the GDP

$t_{calc} < t_\alpha (n - 1) \qquad \longrightarrow \qquad H_0$ will be confirmed

$t_{calc} > t_\alpha (n - 1) \qquad \longrightarrow \qquad H_0$ will be refused

Standard error:

$$s(b) = \sqrt{\frac{S_R}{n-2}} * \sqrt{\frac{n}{n\sum x_i^2 - (\sum x_i)^2}} = \sqrt{\frac{1970.35}{26-2}} * \sqrt{\frac{26}{26 * 238537 - 5697769}} = 0.065$$

$$t = \frac{b}{s(b)} = \frac{0.7759}{0.065} = \textbf{11.9369} \qquad\qquad t_{tab} = \textbf{2.485}[5]$$

$\textbf{t}_{\textbf{0.01}} \textbf{(25)} < \textbf{2.485}$

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[5] See Appendix 4

According to a Student's t-distribution test of 99% quantile and with 25 degrees of freedom is the table value 2.485 which is much lower than the calculated value thus it means the H_0 hypothesis is refused. In other words it means the comparative price level is strongly dependent on the GDP. The same result we would get with even more strict significance level.

4.4 Expected Impact on International Trade and Foreign Direct Investments

As was mentioned before the Czech economy is relatively small and very open. The export of domestic companies is participating by 2/3 on the Czech GDP. Czech companies use the comparative advantages of the Czech economy which is mainly caused by relatively cheap, educated and qualified labour. The big international companies, which came here within a privatization period or were realized as the foreign direct investments here, play the main role in the Czech economy. These companies are the most important makers of the Czech economy; they contribute on the Czech industry production, export and achieve the most valuable economic results. Czech export is composed by 70% from these companies. All of them face the contact with the foreign competitors and consumers within their export, import and financial transactions. The companies under the foreign ownership have much easier approach to foreign distribution channels due to its mother companies and therefore they are able to optimize the costs and expenditures.

The Czech companies under the foreign ownership are generally the most exposed to foreign environment because of the connection with the mother companies and their cohesion by many financial transactions. The uncertainty of the exchange rate fluctuation makes the long-term planning more complicated, it also influences the payment of dividends to mother companies and last but not least influences the value of the company and that is why companies with this foreign structure will benefit the most from the euro adoption.

According to Mill's theory of reciprocal demand there is an advantage for a small country whose demand for domestic products is relatively small and therefore exporters from that small country have much higher chance to find their customers in bigger economies and

markets due to the higher demand which the exporters can find there. With higher potential demand the higher price should the exporters be able to get in foreign markets. The euro adoption will works as the last barrier disposal between the Czech Republic and the common European market and therefore the exporters' income will rise with the level of international trade. But on the other hand with increased level of international trade the home consumers will also benefit from a higher foreign supply but the Czech aggregate demand is much smaller. Home consumers should buy products for lower prices from foreign goods and home producers should use the lower costs in foreign raw materials. By increased income from export and lower costs for imported goods will the net export rise and therefore the general outcome of the Czech economy will rise without any more increased of foreign indebtedness.

The chart no. 14 shows an evolution of the Portuguese export into the euro area countries since 1996 until 2005. In order to prove the Mill's theory about the reciprocal demand and positive impact of the euro adoption on the export within an one currency area was Portugal chosen in purpose because from all the European economies is the most similar with the Czech economy, it basically means the Portuguese economy is relatively small and quite open. The export curve in that chart is composed by value of a whole export into the euro area countries only and is possible to seen the stable growth but during the period of the euro adoption in 1999 the export had been more accelerated. This situation is highlighted by a red circle there. The annual Portuguese export rose in percentage around 6.5% - 7.5% before the euro adoption but during the 1999, when the common currency started to work on electronic basis, the export among the euro area countries almost doubled the results to 12% and then the export started to rise constantly again.

Chart no. 14: Portuguese export into the euro area countries in billion of euros
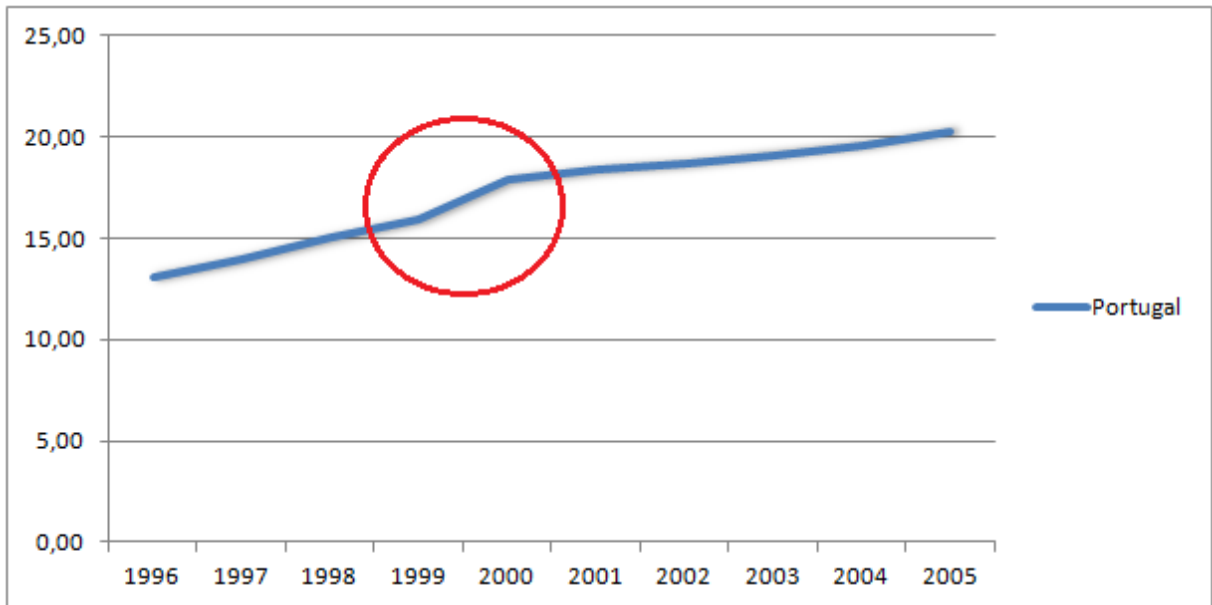
Source: Own elaboration based on the data from Eurostat

The same situation also occurred in all the small European countries during the same year. As the example of all of them the Netherlands was chosen as a representative of a very open economy which illustrates the chart no. 15. Although the Netherlands is definitely not an example of the small economy in Europe, geographically it is quite a small country within the European context. The Dutch export growth reached 6% - 8.5% annually before the euro adoption but during the 1999 their export achieved the annual growth of 21% which is extremely high year-to-year increase. The export curve was constructed in different chart than the Portuguese one from the reason of different export value level.

Chart no. 15: The Dutch export into the euro area countries in billion of euros
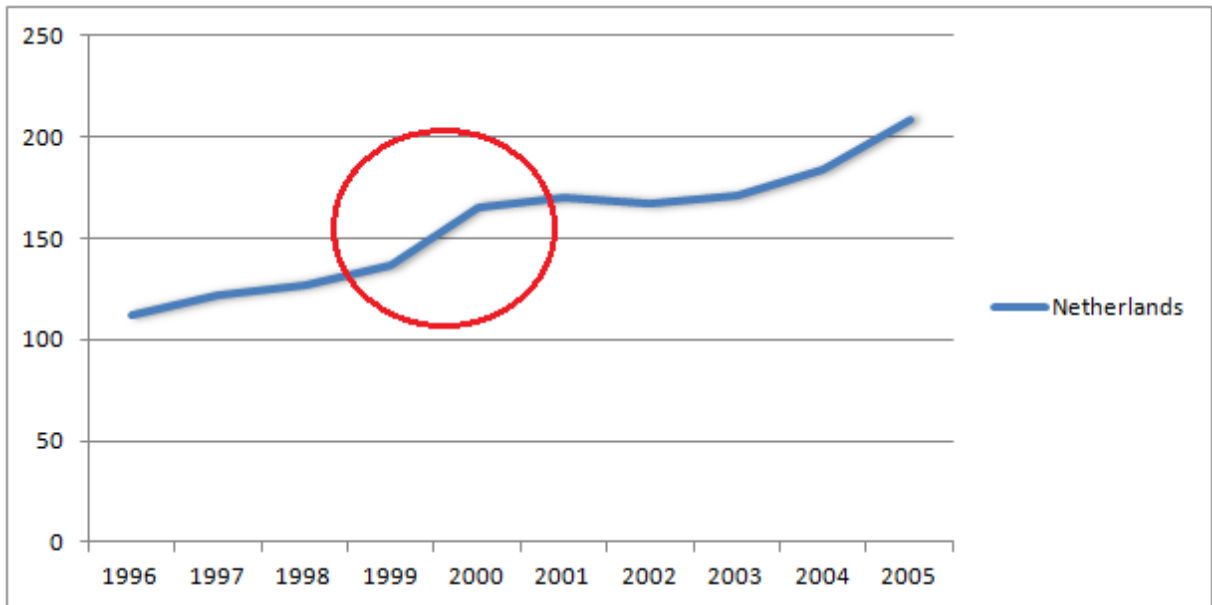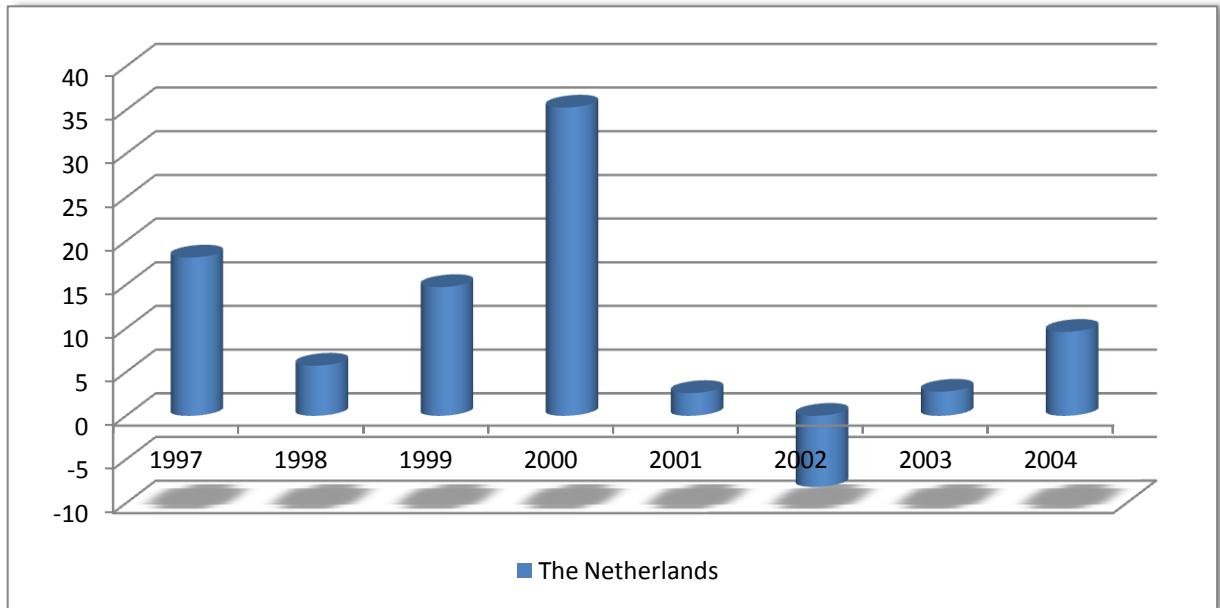

Source: Own elaboration based on the data from Eurostat

The chart no. 16 shows the evolution of the Dutch net export which increased in 2000 by 35%. That explains the market orientation of the Dutch economy which is obviously extremely export oriented as the Czech economy is and the euro adoption even increased the amount of exported products into the euro area countries.

The euro adoption will generally remove the obstacle for free movement of capital thus there is an expectation the capital flows will rise from that reason. The common currency should ensure a better integration of capital markets and easier capital movement among the European economies. The saving of one country might be cheaply placed anywhere else in euro area thus investors will get bigger certainty because will not face the risks connected with the exchange rate fluctuation anymore. Inconsiderable significance for investors will be also a higher reliability of euro currency in compare with the Czech currency.

**Chart no. 16: Evolution of the Dutch net export, annually (%)**

The euro adoption will bring quite a big savings in international trade to small companies and will play more significant role for them than for any other bigger company because of the risks from exchange rate fluctuation which the bigger companies are better able to face against. This is absolutely the most important benefit from the euro adoption because there will not be the situation the exchange rate will appreciate and therefore decrease the price competitiveness anymore. In case of export is there likely possible to increase the volume into the euro area countries. The Czech exporters are actually quite competitiveness even during the unfavourable evolution of the exchange rate thus there is an assumption the common currency will even improve the export numbers in long-term view point and therefore the collected taxes will help the Czech national budget.

The chart no. 17 shows the comparison of the foreign direct investments (FDI) inflow into Portugal and the Czech Republic. Since 1999 the inflow of direct investments sharply increased in Portugal but growing tendency of inflow could be found also in the Czech Republic even without joining the euro area club at that time. The total amount of FDI inflow

into the Czech Republic is even higher than in Portugal for the displayed period thus we can assume the raised inflow of FDI was mainly caused by the willingness of doing investments by companies from developed countries in such countries where the level of development was much lower and therefore high possible appreciation and growth of their investments in developing countries.

Chart no. 17: Foreign direct investments in Portugal and the Czech Republic in millions of euro
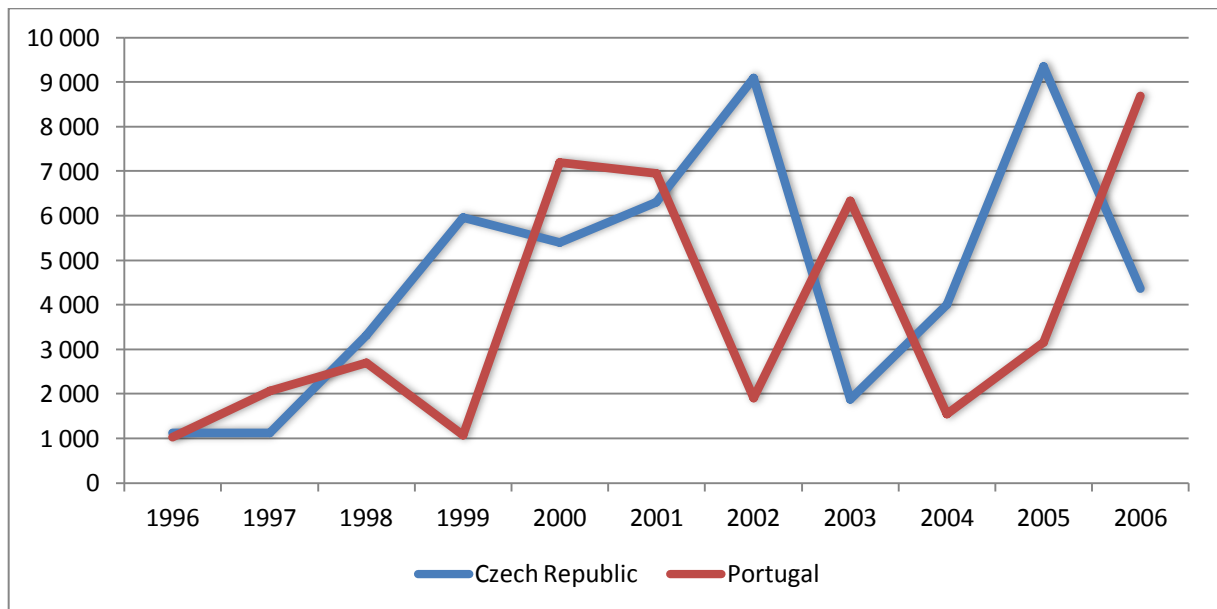
Source: Own elaboration based on the data from Eurostat

Globally there will not be likely chance to distinguish whether the common currency will positively influence the inflow of foreign direct investments because foreign direct investments depend more on the global economic situation and therefore the ability and willingness of foreign companies and investors to invest money in developing markets which proved the Portuguese case in the chart no. 17.

5 Results Evaluation and Recommendations

The Czech Republic fulfils most of the convergence criteria such as price stability criterion, the general government debt request and the long-term interest rate level. The deficit-to-GDP ratio currently the Czech Republic does not fulfil due to the unfavourable economic situation but the long-term outlook of this economic indicator is quite positive in case there will not occur any unexceptional economic circumstance. The exchange rate criterion the Czech Republic cannot fulfil because of non-participating within the ERM II.

The main indicator of the economic performance, GDP indicator, started to fall not only in Portugal but in all the monitored economies after the early euro adoption but since 2003 when the euro was strongly established within the euro area countries the euro started to slightly rise again until the start of an economic recession in 2007. However the annual GDP growth in euro area together achieved around 3%, the comparison with the period before the euro adoption was not that much different thus there is not possible to say the euro launch positively influenced this economic indicator. There is more likely possible to say the GDP growth was caused by regular economic development in the euro area but the euro currency did not negatively influence the groovy order in the economy.

Another indicator which can help to predict the future influence of the euro adoption in the Czech Republic is the level of business cycle convergence with the euro area one. The correlation analysis showed the business cycle convergence with the euro area is very low thus there is a higher chance of the asymmetric shocks. On the other hand if we take into account only the economic results from last 10 years and less which could represent actual economic convergence more but statistically the result will not be that reliable, we would get much favourable result which shows much better correlation with the euro area economic development. This would basically mean the business cycle convergence is getting closer to the euro area one and this trend should be more favourable year by year.

With business cycle convergence also relates the structure of the domestic economy and the euro area structure which could explain the lower business cycle convergence. The biggest structural difference between the Czech and euro area economy was found in share of

service segment and industrial part of each economy. Service segment generally represents more the developed economies whereas the industry is still more typical for developed economies where the Czech one still belongs to within the European context. Because of this fact that industry plays more important role in the Czech economy than in the euro area and that could be a potential threat for the Czech economy in future because within a single monetary policy the Czech economy will be more exposed to the asymmetric shocks in Europe.

The inflation rate started to rise since 1998 in all the three examined countries, until 2001. But right after the euro was launched as a single monetary unit, the inflation rate started to fall there. The price level change on food and non-alcoholic beverages, which are the Czech inhabitants very sensitive on, copied the annual inflation trend of the whole economy. Since the euro cash started to be a valid monetary unit, the inflation rate on these products started to fall in comparison with the previous period. This fact means that even the prices still slightly rose the rate of price rising was for 2% - 3% lower in only one year after the euro was adopted in euro area countries. On the other hand in case of beer and alcoholic drinks only the prices rose in monitored countries even higher than before but it could have been caused by a tax policy in that countries.

The level of economic development and the price level shows very strong mutual correlation between these two indicators thus according to the calculated regression line was found out the Czech's price level is relatively undervalued to the certain level of economic development which means the living standard of Czech inhabitants is relatively higher in comparison with the theoretical price level (measured by a value of real wealth for one inhabitant). This tells us there is a room for the potential small price increase in future. According to the regression analysis this economic outlook was calculated with more than 85% of reliability.

The export which was monitored into the euro area countries recorded a stable growth at the end of 20th century but during the period of the euro adoption export started to be more accelerated. The annual export of both monitored economies rose in percentage around 6.5% -

7.5% before the euro adoption but during the 2000, when the common currency started to work on electronic basis, the export among the euro area countries almost doubled the results to 12% and then the export started to rise constantly again. The same situation with slightly different results also occurred in all the small European countries during the same year. Even the very developed economies started to trade within the euro area market even more which proved the Dutch trade results because their export achieved the annual growth of 21% after the euro adoption which is extremely high year-to-year increase.

The euro adoption will bring quite a big savings in international trade to small companies because of the no risks from exchange rate fluctuation. This could be seen as absolutely the most important benefit from the euro adoption because there will not be the situation the exchange rate will appreciate and therefore decrease the price competitiveness anymore. In case of export is there likely possible to increase the volume into the euro area countries and therefore also the collected taxes will help the Czech national budget. The results of international trade could be definitely seen as a positive impact of the common currency because the exchange transaction costs disappeared among the countries and euro currency basically stimulated the international trade. The euro adoption will generally remove the obstacle for free movement of capital thus there is an expectation the capital flows will rise from that reason. Inconsiderable significance for investors will be also a higher reliability of euro currency in compare with the Czech currency.

At the end it is not possible to certainly say the euro adoption will have only the positive effect on the Czech economy. But the observation on the monitored economies did not show any strictly negative effect connected with the common European currency thus according to the results the euro adoption should contribute in the long-term period to the economic growth which is conditioned by the full convergence of the business cycles mainly. On the other hand is also necessary to say that all the economic results of the monitored countries achieved the results under completely different economic conditions which are very hard to compare but the Czech government is not going to adopt the common currency in next few years thus there is a chance to adopt euro currency after the economic recession and the European debt crisis finally disappear.

6 Conclusion

Development of the Czech economy gives us several arguments for and against the euro adoption. But the most important one for the adoption is a big openness of the Czech economy where the main role plays a high share of foreign trade with the euro area which increases the transaction costs that come from existence of our separate currency.

During the setting down of the planned euro adoption date is mostly judge the level of economic convergence of the Czech economic indicators. However based on the last experience there will be necessary to take care about the euro area itself which means consider more carefully whether the euro area which the Czech Republic should join is in such situation and not only economically but also mainly politically that the euro adoption will be for the Czech Republic a real benefit. By euro adoption will the Czech Republic give up the advantages of our quite successful economic arrangement which we benefited from and which enabled us to achieve the low and stable inflation, have led to high trustworthy in our currency, relatively low indebtedness of the companies and households, low interest rates and external stability of our economy. These assets which we will be favourable to give up only under the condition the economy will benefit from the participation in sustainably functional and internally cohesive euro currency area.

And that it could be seen as an essential problem at this time because the euro area is suffering in a deep debt crisis which has arisen from the economic problems in Greece and followed into the other euro area countries such as Ireland and Portugal. Now even the much economically stronger economies are threatened by the enormous debts which could even theoretically lead to end of the euro area itself.

Nowadays problems came up from the original sins which came along with the European monetary union formation. The first mistake is the EMU has only one "leg" which is the European Central Bank and the second "leg" as a common European bond, common tax or common ministry of finance is missing. The second huge mistake is the fact that EMU should not has ever accepted the Greece as a legal member of the euro area which obviously had never been prepared to adopt the common European currency. Other mistake was that

euro area should has maintained the rules and has used the financial sanctions for those who did not followed them. And at the end the big mistake is the absence of the rules for leaving the euro area or national bankruptcy.

In short-term period there are only two solutions to solve the current European economic problem. The first one is the creation of the euro bond or the unlimited interventions of the ECB. The euro bond was strongly refused by Germany lately thus there is a only chance for the adventurous policy of the ECB which could be in other words expressed by an unlimited liquidity supply from the ECB in case the situation will request it. But that liquidity must be paid by someone and that investor will be the European citizen in the end. From that reason must be explained to regular people that this kind of solidarity with other euro area countries is here from the reason to maintain the euro area as a functional subject and keep all the advantages which come with alive and is worth to stand by for. In other way there is a big chance that Greece followed by Portugal and Ireland will leave the euro area as well as the subsequent tough economic problems in strong European countries which will be the first step of the euro area decay.

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Appendix 1: The three stages to Economic and Monetary Union

Source: http://www.ecb.int/ecb/history/emu/html/index.en.html

Appendix 2: EU financial framework 2007 – 2013

Financial framework 2007 - 2013

adjusted according to the different revisions - current prices

Commitment appropriations	2007	2008	2009	2010	2011	2012	2013	Total 2007- 2013
1. Sustainable Growth	53.979	57.653	61.696	63.555	63.974	66.964	69.957	437.778
1a. Competitiveness for Growth and Employment	8.918	10.386	13.269	14.167	12.987	14.203	15.433	89.363
1b. Cohesion for Growth and Employment	45.061	47.267	48.427	49.388	50.987	52.761	54.524	348.415
2. Preservation and Management of Natural Resources	55.143	59.193	56.333	59.955	60.338	60.810	61.289	413.061
of which: market related expenditure and direct payments	45.759	46.217	46.679	47.146	47.617	48.093	48.574	330.085
3. Citizenship, freedom, security and justice	1.273	1.362	1.518	1.693	1.889	2.105	2.376	12.216
3a. Freedom, Security and Justice	637	747	867	1.025	1.206	1.406	1.661	7.549
3b. Citizenship	636	615	651	668	683	699	715	4.667
4. EU as a global player	6.578	7.002	7.440	7.893	8.430	8.997	9.595	55.935
5. Administration [1]	7.039	7.380	7.525	7.882	8.334	8.670	9.095	55.925
6. Compensations	445	207	210					862
Total commitment appropriations	124.457	132.797	134.722	140.978	142.965	147.546	152.312	975.777
as a percentage of GNI	1,02%	1,08%	1,16%	1,18%	1,16%	1,13%	1,12%	1,12%

Source: http://ec.europa.eu/budget/figures/fin_fwk0713/fwk0713_en.cfm#cf07_13

Appendix 3: Data set for regression analysis

	GDP in PPS (x)	Comparative price levels (y)	x_iy_i
Belgium	119	111,6	13280,4
Bulgaria	44	50,5	2222
Czech Republic	82	72	5904
Denmark	125	142,5	17812,5
Germany	117	104,2	12191,4
Estonia	64	75,1	4806,4
Ireland	127	118,2	15011,4
Greece	88	95,5	8404
Spain	101	96,7	9766,7
France	107	111,8	11962,6
Italy	100	103,6	10360
Cyprus	97	89,3	8662,1
Latvia	52	69,3	3603,6
Lithuania	58	63,5	3683
Hungary	63	65,5	4126,5
Malta	83	78,9	6548,7
Netherlands	133	106,1	14111,3
Austria	126	107,1	13494,6
Poland	62	62,6	3881,2
Portugal	81	87,6	7095,6
Romania	45	58,6	2637
Slovenia	86	84	7224
Slovakia	74	71,2	5268,8
Finland	116	122,9	14256,4
Sweden	123	119,8	14735,4
United Kingdom	114	100,3	11434,2
Σ	2387	2368,4	232483,8
Average	91,81	91,09	

Source: Eurostat and own calculations

Appendix 4: Table of critical values for Student's t distributions

TABLE of CRITICAL VALUES for STUDENT'S *t* DISTRIBUTIONS

Column headings denote probabilities (α) **above** tabulated values.

d.f.	0.40	0.25	0.10	0.05	0.04	0.025	0.02	0.01	0.005	0.0025	0.001	0.0005
1	0.325	1.000	3.078	6.314	7.916	12.706	15.894	31.821	63.656	127.321	318.289	636.578
2	0.289	0.816	1.886	2.920	3.320	4.303	4.849	6.965	9.925	14.089	22.328	31.600
3	0.277	0.765	1.638	2.353	2.605	3.182	3.482	4.541	5.841	7.453	10.214	12.924
4	0.271	0.741	1.533	2.132	2.333	2.776	2.999	3.747	4.604	5.598	7.173	8.610
5	0.267	0.727	1.476	2.015	2.191	2.571	2.757	3.365	4.032	4.773	5.894	6.869
6	0.265	0.718	1.440	1.943	2.104	2.447	2.612	3.143	3.707	4.317	5.208	5.959
7	0.263	0.711	1.415	1.895	2.046	2.365	2.517	2.998	3.499	4.029	4.785	5.408
8	0.262	0.706	1.397	1.860	2.004	2.306	2.449	2.896	3.355	3.833	4.501	5.041
9	0.261	0.703	1.383	1.833	1.973	2.262	2.398	2.821	3.250	3.690	4.297	4.781
10	0.260	0.700	1.372	1.812	1.948	2.228	2.359	2.764	3.169	3.581	4.144	4.587
11	0.260	0.697	1.363	1.796	1.928	2.201	2.328	2.718	3.106	3.497	4.025	4.437
12	0.259	0.695	1.356	1.782	1.912	2.179	2.303	2.681	3.055	3.428	3.930	4.318
13	0.259	0.694	1.350	1.771	1.899	2.160	2.282	2.650	3.012	3.372	3.852	4.221
14	0.258	0.692	1.345	1.761	1.887	2.145	2.264	2.624	2.977	3.326	3.787	4.140
15	0.258	0.691	1.341	1.753	1.878	2.131	2.249	2.602	2.947	3.286	3.733	4.073
16	0.258	0.690	1.337	1.746	1.869	2.120	2.235	2.583	2.921	3.252	3.686	4.015
17	0.257	0.689	1.333	1.740	1.862	2.110	2.224	2.567	2.898	3.222	3.646	3.965
18	0.257	0.688	1.330	1.734	1.855	2.101	2.214	2.552	2.878	3.197	3.610	3.922
19	0.257	0.688	1.328	1.729	1.850	2.093	2.205	2.539	2.861	3.174	3.579	3.883
20	0.257	0.687	1.325	1.725	1.844	2.086	2.197	2.528	2.845	3.153	3.552	3.850
21	0.257	0.686	1.323	1.721	1.840	2.080	2.189	2.518	2.831	3.135	3.527	3.819
22	0.256	0.686	1.321	1.717	1.835	2.074	2.183	2.508	2.819	3.119	3.505	3.792
23	0.256	0.685	1.319	1.714	1.832	2.069	2.177	2.500	2.807	3.104	3.485	3.768
24	0.256	0.685	1.318	1.711	1.828	2.064	2.172	2.492	2.797	3.091	3.467	3.745
25	0.256	0.684	1.316	1.708	1.825	2.060	2.167	2.485	2.787	3.078	3.450	3.725
26	0.256	0.684	1.315	1.706	1.822	2.056	2.162	2.479	2.779	3.067	3.435	3.707
27	0.256	0.684	1.314	1.703	1.819	2.052	2.158	2.473	2.771	3.057	3.421	3.689
28	0.256	0.683	1.313	1.701	1.817	2.048	2.154	2.467	2.763	3.047	3.408	3.674
29	0.256	0.683	1.311	1.699	1.814	2.045	2.150	2.462	2.756	3.038	3.396	3.660
30	0.256	0.683	1.310	1.697	1.812	2.042	2.147	2.457	2.750	3.030	3.385	3.646
31	0.256	0.682	1.309	1.696	1.810	2.040	2.144	2.453	2.744	3.022	3.375	3.633
32	0.255	0.682	1.309	1.694	1.808	2.037	2.141	2.449	2.738	3.015	3.365	3.622
33	0.255	0.682	1.308	1.692	1.806	2.035	2.138	2.445	2.733	3.008	3.356	3.611
34	0.255	0.682	1.307	1.691	1.805	2.032	2.136	2.441	2.728	3.002	3.348	3.601
35	0.255	0.682	1.306	1.690	1.803	2.030	2.133	2.438	2.724	2.996	3.340	3.591
36	0.255	0.681	1.306	1.688	1.802	2.028	2.131	2.434	2.719	2.990	3.333	3.582
37	0.255	0.681	1.305	1.687	1.800	2.026	2.129	2.431	2.715	2.985	3.326	3.574
38	0.255	0.681	1.304	1.686	1.799	2.024	2.127	2.429	2.712	2.980	3.319	3.566
39	0.255	0.681	1.304	1.685	1.798	2.023	2.125	2.426	2.708	2.976	3.313	3.558
40	0.255	0.681	1.303	1.684	1.796	2.021	2.123	2.423	2.704	2.971	3.307	3.551
60	0.254	0.679	1.296	1.671	1.781	2.000	2.099	2.390	2.660	2.915	3.232	3.460
80	0.254	0.678	1.292	1.664	1.773	1.990	2.088	2.374	2.639	2.887	3.195	3.416
100	0.254	0.677	1.290	1.660	1.769	1.984	2.081	2.364	2.626	2.871	3.174	3.390