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## **MAASTRICHT CRITERIA: ANALYSIS OF THE CZECH REPUBLIC POSITION IN THE EU**

### **1. Introduction**

The Czech Republic obliged to the future EMU entry by its EU/EC admission (2004). The Maastricht criteria are the EMU entry conditions. The Maastricht criteria have been defined in the Maastricht Treaty (1991) as the preconditions representing the different economic areas and policies:

- **area of price stability (inflation rate)** – member state has to show long-term sustainable price stability and average inflation rate; the average annual inflation rate can't exceed the average of the inflation rate of the three states with the lowest inflation rate more than 1,5%,
- **area of the interest rate stability (long-term interest rates)** – long-term interest rate of the state bond or comparable bonds of the member state can't exceed the average long-term interest rate of the three states with the lowest inflation rate more than 2% during one year before the evaluation,
- **area of exchange rate stability (exchange rate)** – member state should keep his exchange rate in the exchange rate mechanism of the EC (ERM I) in its normal spread of oscillation and in the period can't devalue bilateral exchange rate against any exchange rate of the member state currency,
- **area of fiscal policy (general government deficit)** – relation of the planned or real deficit of the general government deficit to the gross domestic product in the market price can't exceed advisable value of 3% in the investigation period; general government budget includes central government, regional or local government, and the budgets of the funds of the social security,

- **area of fiscal policy (government debt)** – relation of the government debt to the gross domestic product should not exceed advisable value of 60% in the investigation period; the debt is defined as the consolidated debt of the individual branches of the state sector in the nominal values at the end of the year [5].

The Maastricht criteria fulfillment is obligatory for those countries, which want to enter the EMU. I was interested in, whether the Maastricht criteria were fulfilled only by the countries which finally enter the EMU. In other words whether the Maastricht criteria fulfillment divided the EU countries into the EMU countries and other EU member states. The next question, which will be treated by this paper, is how, when, and whether the CR started to fulfill the Maastricht criteria and whether the CR started to converge towards the other EMU member states. The criteria of the exchange rate stability was not included in this analysis from two reasons: the member states had several oscillation regimes and spreads, in which kept their pegged exchange rates in the condition of the ERM I; and the CR is not still in the ERM II and also was not in the analyzed period. The exchange rate spread within the ERM II will be stated to the CR in the future several years.

The cluster analysis was used as the main research method, using the group average method to include and gather the common characters of the individual cluster in the best way. The squared Euclidean distance metric was chosen. The average was used from other statistical methods, there were other methods used: secondary data collection (especially from the EU statistics), comparison, analysis, and synthesis.

## **2. Are the Maastricht criteria fulfillment decisive criteria in the EU and in the EMU?**

This part of the article wants to answer the following question: Are the Maastricht criteria fulfilled only by the countries whose are obliged to fulfill them or only by those countries whose entered the EMU? In the case that the Maastricht criteria were perceived only as the “EMU entry tickets” [4], we could say that following statement will hold – the Maastricht criteria will be fulfilled only by those countries whose want to enter the EMU. In the case that the Maastricht criteria fulfill task of the stability and growth function then the criteria will be fulfilled also by the EU member states, which decided not to enter the EMU. It means that the criteria provide economic stability in the condition of the open economy together with that they represent conditions for healthy growth of economy. According previous ideas we can define following hypothesis:

H0: The Maastricht criteria are fulfilled only by those countries whose want to entry the EMU (the Maastricht criteria are only the entry tickets to the monetary union).

H1: The Maastricht criteria are fulfilled by all EU member states regardless whether they are the EMU member states or aren't (the Maastricht criteria fulfills stabilization and growth function).

The cluster analysis was chosen as the main used statistical method, with average group method and squared Euclidean distance metric. Analyzed period was set in the period 1996-2003. This period was chosen because the criteria fulfillment was monitored also during the EMU performance. The second point of view is also the shortage of the analyzed period 1996-1999, the only monitoring period before the EMU entry. This period couldn't be statistically used. The average was used in the case of the Maastricht criteria calculation (inflation rate and subsequently the long-term interest rate) and their maximum tolerable values.

Results of the cluster analysis are stated in Tab. 1. The number of cluster was settled on 2 in order to enable the clusters, which would distinguish the states those fulfilled the criteria (in the case that the H0 will hold – one cluster will be created by the EMU member states and the second one by the other states (by Denmark, Sweden and the United Kingdom)).

Table 1. Results of the cluster analysis of the Maastricht criteria fulfillment by the EU member states, 1996-2003

Indicator	1 <sup>st</sup> cluster	2 <sup>nd</sup> cluster
INFLATION	Greece, United Kingdom	Belgium, Germany, Spain, France, Ireland, Italy, Luxembourg, Austria, Portugal, Finland, Denmark, Sweden
LONG-TERM INTEREST RATES	Greece, United Kingdom	Belgium, Germany, Spain, France, Ireland, Italy, Luxembourg, Austria, Portugal, Finland, Denmark, Sweden
RELATION OF GOVERNMENT DEFICIT TO GDP	Portugal	Belgium, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, Austria, Finland, Denmark, Sweden, United Kingdom
RELATION OF THE GOVERNMENT DEBT TO GDP	France, Germany	Belgium, Greece, Spain, Ireland, Italy, Luxembourg, Portugal, Austria, Finland, Denmark, Sweden, United Kingdom

Source: [2]; own calculations.

Looking at the Maastricht criteria fulfillment in detail we can find that the created clusters do not respond to the groups of states, which should be created on condition that the H0 would hold. The cluster analysis detached these states, which

had similar criteria fulfillment development in the analyzed period of 1996-2003 regardless to stress the main attention on the criteria values. The most decisive criteria were the similarity of the analyzed cluster. Let's have a look at their more detailed analysis.

### **Inflation rate**

Greece and the United Kingdom had the downward and the upward trend of the inflation rate with only one point of local minimum in the analyzed period. Other states showed long-term downward trend or their inflation rates changed several times (with several points of local minimums), The calculation of the tolerable maximum value of the criterion on the price stability was done in each year of the analyzed period. The criterion on price stability was not fulfilled only by Greece during whole analyzed period. On the other hand I found that the EMU non-member states (Denmark, Sweden and the United Kingdom) fulfilled the criterion on price stability in the whole analyzed period 1996-2003. In the case that these countries would entry the EMU the maximum tolerable values would have been even smaller (especially Sweden was the country with the lowest inflation rates). It means that the hypothesis H1 holds in the case of the criterion on price stability.

### **Long-term interest rates**

Greece and the United Kingdom – again two states with similar trends of the long-term interest rates development. In this case we can speak about stable downward trend. Greece was the only the state, which didn't fulfill required criterion in analyzed period 1996-1998. EMU non-member states (Denmark, Sweden and the United Kingdom) hadn't any problems with the fulfillments of the criterion on the long-term interest rates during entire period. It means that the hypothesis H1 also holds in the case of the criterion on the long-term interested rates.

### **General government deficit**

Portugal – the only state with constant downward trend within whole period. Other states went through steep improvement (e.g. Finland, Spain and Belgium) or fluctuant trend (e.g. Ireland, Italy and the Netherlands). We can say that all EMU member states had problems with the fulfillment of the criterion on general government deficit during whole period. The only year 1998 was bright exception – it was the year when the EMU countries were evaluated. Greece was the state with the biggest problems – it never fulfilled the criterion except the year of 1998. Contrary the EMU non-member states hadn't any significant problems with this criterion: Denmark and Sweden fulfilled the criterion on general government deficit within all analyzed period, the United Kingdom except year of 1996, 1997

and 2002. We can say that the hypothesis H1 also holds in the case of the criterion on the general government deficit.

### **Government debt**

France and Germany – the countries with similar values of the criterion on government debt oscillating around the maximum 60%, with increase of the values in the last years of the analyzed period (Germany fulfilled the criterion only in 1996 and 2002, France during 1996-2002.) Majority of the EMU states had important problems with the fulfillment of the criterion. Contrary the EMU non-member states hadn't any significant problems (Denmark didn't fulfill the criterion only during 1996-1998, Sweden during 1996-1999, and the United Kingdom fulfilled the criterion on the government debt during whole analyzed period.) We must again admit the hypothesis H1.

Concluding the results of the cluster and comparative analyses we can find that the Maastricht criteria were visible "entry tickets to the EMU" but no the factor, which would divide the EU member states into two groups: the EMU member states and the EMU non-member states. Contrary we found that the EMU non-member states had much better results than the EMU member states. From all of those reasons we can admit hypothesis H1 that the Maastricht criteria led to the economy stability and growth/prosperity. Both stability and growth are important factors not only in the condition of the monetary union – EMU.

### **3. How does the CR fulfill the Maastricht criteria and can we find any marks of the convergence?**

We found that the Maastricht criteria fulfillment should be the economic priority regardless the EMU membership. The Czech Republic is also obliged to fulfill the criteria entering the EU. We intend to find whether the CR started to converge towards the EMU economies during 1996-2003. The question is: When and in which area has the CR economy started to converge towards the EMU economies.

The cluster analysis was again chosen as the main research method, using the group average methods and squared Euclidean distance metric. The number of the clusters were stated on 3 in order to the non-converged economy could be excluded into individual cluster. Analyzed period is 1996-2003. The cluster analysis was calculated separately for the each Maastricht criterion, in the each year of the analyzed period. We could assure that we can identify the year when the CR started to converge. The results of the individual cluster analyses and final results are presented in Tab. 2.

Table 2. Results of the cluster analysis of the CR convergence to the EMU member states, 1996-2003

Indicator	Date of the convergence	Process of the convergence
INFLATION	1999	1996, 1997 – together with Greece, 1998 – the CR – the individual cluster, 1999 – 2003 – together with Austria, Belgium and Finland (alternately with Germany, the Netherlands, Portugal and Spain)
LONG-TERM INTEREST RATES	2002	1996 – 2001- the CR – the individual cluster, 2002 – 2003 – together with Austria, Belgium, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain
RELATION OF GOVERNMENT DEFICIT TO GDP	1996 / 1997	1997 – the CR – the individual cluster, 1998 – together with Finland, France, Germany, Italy, Luxembourg and the Netherlands (alternately with Ireland)
RELATION OF THE GOVERNMENT DEBT TO GDP	1996	1996 – 2003 – together with France and Germany (alternately with Finland, the Netherlands and Portugal)

Source: [2]; [3]; own calculations.

When we would look at how the Czech Republic really fulfills the Maastricht criteria we would get following Tab. 3.

Table 3. The Czech Republic fulfillment of the Maastricht criteria, 1996-2003

Indicator	Year	Fulfilled (Yes/No)	Indicator	Year	Fulfilled (Yes/No)
INFLATION	1996	No	LONG-TERM INTEREST RATES	1996	No
	1997	No		1997	No
	1998	No		1998	No
	1999	Yes		1999	No
	2000	No		2000	Yes
	2001	No		2001	Yes
	2002	Yes		2002	Yes
	2003	Yes		2003	Yes
RELATION OF GOVERNMENT DEFICIT TO GDP	1996	Yes	RELATION OF THE GOVERNMENT DEBT TO GDP	1996	Yes
	1997	Yes		1997	Yes
	1998	No		1998	Yes
	1999	No		1999	Yes
	2000	No		2000	Yes
	2001	No		2001	Yes
	2002	No		2002	Yes

Source: [2]; [3]; own calculations.

We can compare that the cluster analyses results don't correspond with the results of the Maastricht criteria fulfillment. It is caused by the fact that the only Maastricht criteria fulfillment doesn't speak much about how the CR economy converges to the EMU economies. The results from the Tab. 2 speak about convergence. We can see that despite of the fact that the Czech Republic doesn't fulfill some of the individual criterions, the Czech Republic converges in this field (e.g. criterion on price stability). It is made by the fact that other EMU member states don't properly fulfill this criterion either. Contrary some other criterion is fulfilled according the minimum required value; nevertheless, we cannot speak about convergence because the Czech value is still very high compare to the EMU member states ones (e.g. the long-term interest rates). We must include the result both of the tables and analyses because the Czech economy will have to be converged before its EMU entry in order to minimize the negative entry shocks but we will have to fulfill the real requirements of the Maastricht criteria too. We can assume that the requirements will be very similar because the EU 12/15 states will create healthier core of the EMU/EU economy and they will be the states according them the Maastricht criteria will be calculated.

What we could say? The Czech Republic showed convergence tendency during 1996-2003, which ended in the total convergence in the area of price stability and long-term interest rates. In the case of the price stability the Czech Republic started to converge in 1999, in the case of long-term interest rates the CR started to converge as late as in 2002. In the area of the fiscal criterions the Czech Republic hadn't any problems.

We could get another results dealing with the real Maastricht criteria fulfillment. The Czech Republic hasn't any problems with the criterion on price and interest rate stability. The most significant problem lies in the field of the fiscal criterion – the general government deficit. The Czech Republic exceeds the maximum values 3% many times. The criterion on government debt is still in relation of required values, deeply under the EMU states average. Nevertheless, the Czech Republic should think over the speed of the indicator increase. The results of this analysis are consistent with the results of the European Commission Convergence Report 2004 [1].

#### **4. Conclusion**

The Maastricht criteria were stated as the entry condition for the EMU membership. The cluster analysis completed by the calculations and the comparative analysis showed and proved that the Maastricht criteria fulfill the

primary role for the economic stability and growth. In the analyzed period 1996-2003 the Maastricht criteria fulfillment didn't divide EU member states into the EMU states and others (Denmark, Sweden and the United Kingdom). Contrary the EMU non-member states better fulfilled the criteria than the EMU member states. The hypothesis H1 that the Maastricht criteria fulfill the stabilization and growth role was admitted from previous reasons. CR became one of the EU member states since May 2004 with the obligation the EMU entry in the future. The Maastricht criteria fulfillment is then the obligation for the Czech Republic. Based on the analysis results we can say that the Czech republic by itself should attempt and make an effort to fulfill the criteria.

In the second part there is solved the question whether the Czech economy converged towards the EMU economies during 1996-2003. The Czech Republic started to converge in the area of price stability in 1999, in the area of long-term interest rates three years later in 2002. The Czech Republic was totally converged with the EMU member states in the field of fiscal criterions. Nevertheless, The Czech Republic will have to take into account not only the economy convergence but also real fulfillment of the Maastricht criteria before its EMU entry. In this case the Czech Republic should focus on the fiscal criterions. Many EMU states don't fulfill the criteria – but it will not hold for the CR in the moment of the EMU entry or during the evaluation period before the entry. Nonfulfillment of the Maastricht criteria would result in the closure of the EMU entry. According this fact the Czech Republic should focus on the criterion on the general government deficit and the speed of the government debt increase.

## References

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## **KRYTERIA Z MAASTRICHT: ANALIZA POZYCJI CZECH W UNII EUROPEJSKIEJ**

### **Streszczenie**

Artykuł zawiera analizę empiryczną kryteriów z Maastricht oraz udziela odpowiedzi na dwa istotne pytania: czy kryteria z Maastricht dzielą państwa członkowskie Unii Europejskiej na kraje, które winny spełniać te kryteria oraz takie, które spełniać ich nie muszą – czy możemy ewidentnie podzielić kraje na państwa członkowskie Maastricht UE oraz państwa członkowskie UE, które nie należą do MUE? Pytanie drugie dotyczy pozycji Republiki Czeskiej w Unii Europejskiej. Autor referatu stawia pytanie w jaki sposób Czechy spełniły kryteria z Maastricht w analizowanym okresie czasu oraz czy istnieje możliwość zidentyfikowania pewnych oznak konwergencji.