ESTIMATING THE BUSINESS CYCLE SYNCHRONIZATION BETWEEN ROMANIA AND THE EURO AREA

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Abstract
The conditions of the well-functioning of a monetary union were defined by the optimum currency area theory. From this perspective, the business cycles synchronization outlined itself as a meta-condition for the benefits of sharing a common currency to surpass its costs. The synchronization between the economies of the countries that have recently joined the EU and the one of the Euro area has proved itself of maximum importance given, on the one hand, these countries' objective to adopt the common European currency, but also the obvious crystallization, in the present EU crisis, of the strong economies within the EMU, the evolution of which could dictate the economic perspective of the other economies (outside EMU) linked to them. Thus, our analysis focuses on the estimation of the business cycle synchronization between Romania, as a new member state, and the euro area as a whole, but also between Romania and each member taken individually. For the estimation, we have used both parametric and non-parametric correlation methods. For comparison reasons, the analysis vis-à-vis the Euro area as a whole was also expanded to the other new member states that haven't adopted the euro yet.
Keywords: Economic and Monetary Integration, Optimum Currency Area, Business Cycles, new EU members.

1. INTRODUCTION

The conditions of the creation of a monetary union were stated by the theory of the optimum currency area in its dynamics. These conditions are circumscribed to the concept of the business cycles synchronization as a „meta-condition" for the well-functioning of a monetary union. The analysis of the business cycles' synchronization has gained in importance in the economic literature starting with the beginning of the `90, once the need of assuring a proper answer to a monetary policy common impulse in different economies, with different particularities, became more pressing in the perspective of the third stage of the Economic and Monetary Union (EMU). The analysis related to the founding members of the

Business Excellence and Management
Volume 6 Issue 1 /March 2016

EMU have proven the parallelism between the sinusoidal evolution of the synchronization degree between the participating economies and the history of EMU (Artis, Zhang, 1995) allowing the identification of some of its determining factors, such as the stability of the foreign exchange rate (The fall of the Breton Woods system in 1973 determined the decrease of the synchronization degree until the Exchange Rate Mechanism. During the Exchange Rate Mechanism (1979-1993) the participating member states have reoriented their cycles' synchronization from the one of the United States to the one of Germany), the geographical approach between the states and the shocks imported by the small economies from those countries to which they fix their currency (This was obvious especially after the German unification).

The studies concerning the new member states are comparatively fewer, and they were elaborated especially in the period of the preparation of their accession to the European Union or immediately after the accession (Trăistaru, 2004; Darvas and Szapary, 2004; Savva et al., 2007). Another weakness of the literature concerning the new member states consists in the fact that they don't cover all the new member states (the study of the European Commission European Economy 1/2009 (European Comision, „Five Years of an Enlarged EU: Economic Achievements and Challenges", European Economy 1/2009) for example does not include Romania and, partially, Malta).

2. ANALYSIS AND RESULTS

Seven full years have passed from the accession of ten new member states to EU, and four full years from the accession of Romania and Bulgaria. Our analysis focuses on the study of the synchronization degree between Romania and the euro area, but, for comparison reasons, also on the synchronization of all the other new member states that haven't adopted the single currency yet (Bulgaria, the Czeck Republic, Estonia (outside the euro zone at the moment 2010), Hungary, Latvia, Lithuania and Poland.), given the fact that the optimum currency area theory does not indicate a suitable synchronization degree for a monetary integration to work.

The objective was also to study the evolution of the synchronization degree before and after the adhesion to the EU. In this respect, besides the main period taken into account i.e. 2000-2010, we've considered three sub-periods, 2000-2002, 2003-2006 and 2007-2010. The last two sub-periods present a particular importance for Romania, 2003-2006 including the moment of the full liberalization of the capital account and the signing of the accession Treaty to the EU, while 2007 represents the post-accession period marked also by the global crisis. Given the short length of these periods, we used as an indicator the index of industrial production (IIP), which, compared to the GDP, presents the

advantage of providing monthly data. Also, the IIP may better capture the business cycles synchronization given the increase of the economic integration in Europe and the fact that the industrial production comprises mostly tradable goods. Data was provided by Eurostat.

For the identification of the business cycles we've started from Lucas' definition of the business cycle (1977) as a deviation from its trend of an indicator of the economic activity i.e. the IIP in our case. For the extraction of the trend we have used the Hodrick-Prescott filter in EViews (Using as a value for the instrument λ the one given by EViews, λ = 14400). To ensure the robustness of the analysis, for the estimation of the cycles' synchronization, we have used three correlation methods, both parametric and non parametric i.e. Pearson linear correlation coefficient and Spearman and Kendall correlation coefficients (using KyPlot).

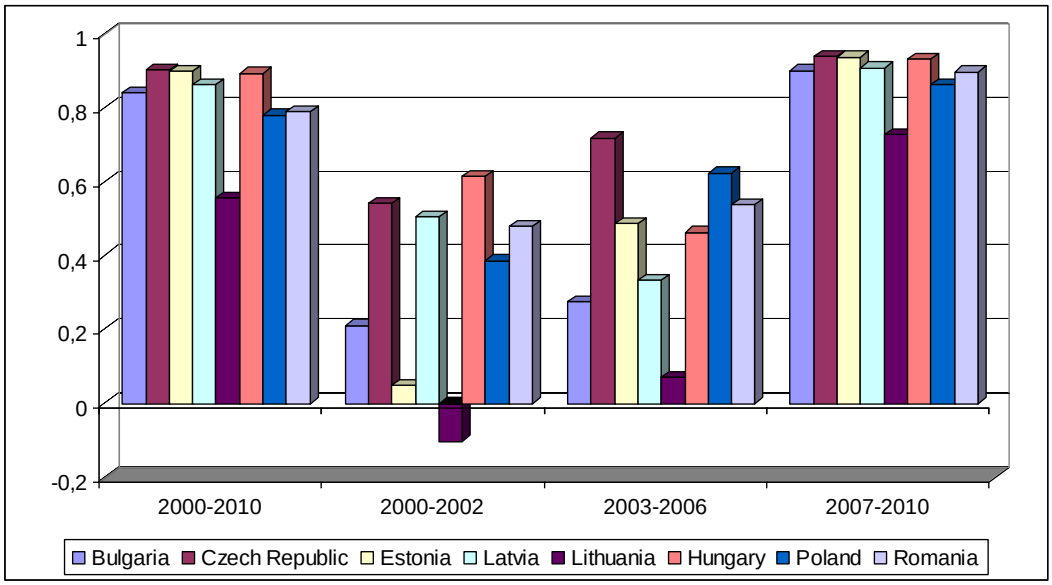

FIGURE 1 - PEARSON CORRELATION OF THE BUSINESS CYCLES BETWEEN THE EURO AREA AND THE NEW MEMBER STATES THAT HAVEN'T ADOPTED THE EURO YET
Source: Our calculations

All the three methods illustrate a high degree of synchronization between the Romanian economy and the one of the euro area for the period 2000-2010, as well as a significant improvement of the synchronization after Romania has joined the EU. This was the result of the efforts made to ensure a higher similarity of the economic structure compared to the euro area (the decrease of the agriculture share in the value added in the economy), as well as of the increase of the importance of the EU as a trade partner for Romania.

Business Excellence and Management
Volume 6 Issue 1 /March 2016

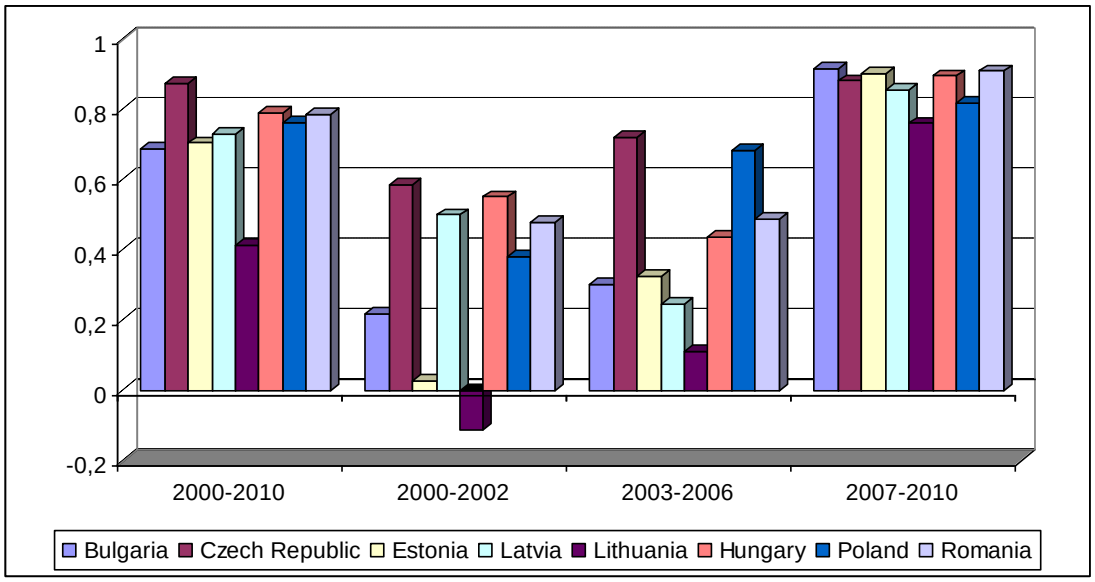

FIGURE 2 - SPEARMAN CORRELATION BETWEEN THE EURO AREA AND THE NEW MEMBER STATES THAT HAVEN'T ADOPTED THE EURO YET
Source: Own calculations

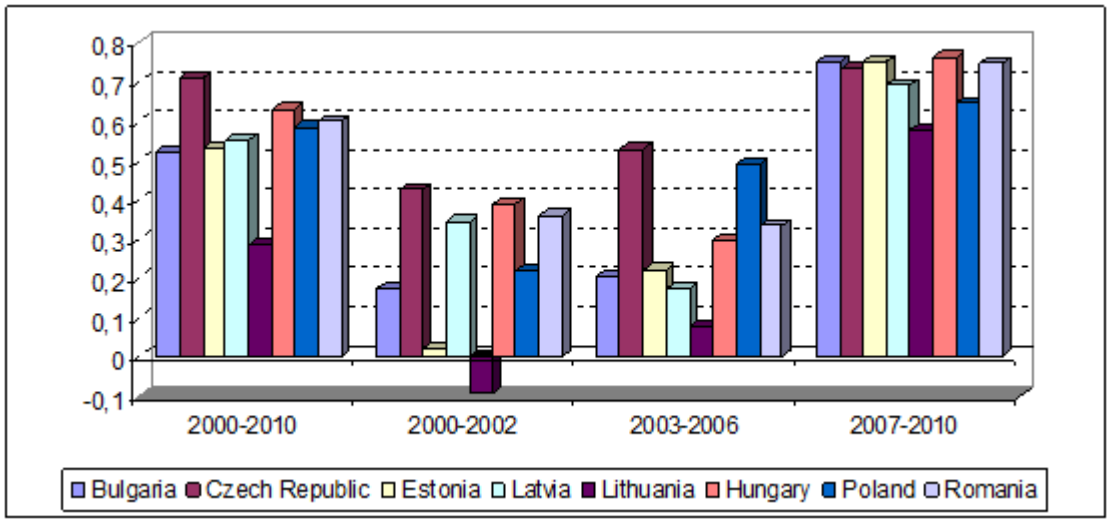

FIGURE 3 - KENDALL CORRELATION BETWEEN THE EURO AREA AND THE NEW MEMBER STATES THAT HAVEN'T ADOPTED THE EURO YET
Source: Own calculations

We notice that the discrepancies between Romania and the other new member states regarding their synchronization with the euro area depend on the coefficients used, the non-linear coefficients positioning Romania on a better place for the whole period than the linear one. Thus, if, using the Pearson coefficient, Romania is placed on the sixth position among the eight countries of the panel, the

Spearman and Kendall coefficients put Romania on the third position. Moreover, as we've mentioned before, even if it places Romania on a disadvantaged position compared to most of the other countries (with the exception of Poland and Lithuania) even the Pearson coefficient illustrates a high degree of synchronization i.e. 79%, despite the very poor performance in the first sub-period i.e. 2000-2003. Thus, the improvement was significant after 2007, the level of synchronization passing from 48% in early 2000s' to almost 90% between 2007 and 2010 (Figure 1). Using the Pearson coefficient the Czech Republic, Estonia, Latvia and Hungary present the highest level of synchronization.

The analysis of the results of the three methods used allows us to draw the following conclusions:

- The Czech Republic presents the highest synchronization degree with the euro area, the improvement of the correlation between the sub-periods considered being of about 30%. One should notice that, before 2000, the Czech Republic was considered as having one of the least synchronized economies with the euro area, due to its macroeconomic imbalances from the first half of the `90. These have determined the currency crisis of 1997, bringing the country to the recession. Nevertheless, the acceleration of the reforms after 2000 have brought the Czech Republic on a new trend;
- Given the fact that the Baltic countries have switched from the Russian influence to the one of the Euro area, their economies have become considerably more synchronized with the one of the EMU, Estonia and Latvia being today among the countries with the most synchronized economies with the euro. Estonia, for example, has passed from a correlation of 4,9% in the early 2000s to 93,9% between 2007 and 2010 (second position according to the linear correlation). The strategic orientation towards Europe took place after the effects of the Russian crisis in 1998, i.e. between 1998 and 2002. The evolution is the most striking for Lithuania, which presented an asynchronous cycle with the euro zone between 2000 and 2002, regardless the method used, and obtained a 72% correlation degree after 2007 (according to the Pearson coefficient). As concerns Latvia, we notice that, just like Hungary, this country recorded a decrease of the correlation with the euro area after its joining the EU. Nevertheless, the recover after 2007 was strong enough so that both countries succeeded in surpassing Poland, which was characterized from the very beginning by a high correlation with the euro area;
- Bulgaria presents a linear correlation slightly higher than Romania; still, using the non-parametrical methods we obtained a less favorable position for Bulgaria compared to one of Romania (7th position).

Business Excellence and Management
Volume 6 Issue 1 /March 2016

Given the differences existing among the economies of the Euro area, we have also analyzed the correlation between the Romanian economy and the euro zone members taken individually. The results of the three methods used are presented in Table 1.

TABLE 1. SYNCHRONIZATION DEGREE BETWEEN ROMANIA AND THE EURO ZONE COUNTRIES (2000-2010) (%)

	Pearson correlation coefficient		Spearman correlation coefficient		Kendall correlation coefficient	
	HP	position	HP	position	HP	position
Austria	75,89	6	75,73	**2**	57,06	**3**
Belgium	58,46	11	56,85	10	41,33	10
Estonia	67,51	9	59,73	9	42,39	9
Finland	77,46	**2**	73,02	4	54,81	5
France	74,16	8	69,82	7	52,28	7
Germany	77,16	**3**	76,27	**1**	57,68	**1**
Greece	44,54	14	45,11	13	30,95	13
Ireland	21,67	15	25,58	15	16,45	15
Italy	76,85	4	75,45	**3**	57,09	**2**
Luxembourg	60,16	10	51,78	11	37,32	11
Netherlands	50,21	13	41,57	14	29,46	14
Portugal	54,27	12	49,32	12	34,04	12
Slovakia	76,23	5	68,52	8	50,41	8
Slovenia	74,62	7	71,01	6	53,11	6
Spain	78.89	**1**	72,94	5	54,97	4

Source: Own calculations

3. CONCLUSIONS

The results analysis illustrates a high correlation between Romania and Germany, Spain, Austria and Italy. These results are not surprising given the strong trade relations between Romania, on the one hand, and Germany, Italy and Austria, on the other hand. Also, Germany represents a particular case, its business cycle becoming more correlated to the one of Romania in the recent years, due to some German programmes e.g. the one concerning cars' renewal that had a positive impact on some productive sectors of the Romanian economy (transport industry and its related branches).

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