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Article

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Amfiteatru Economic Journal

Provided in Cooperation with:
The Bucharest University of Economic Studies

Suggested Citation: Botrić, Valerija; Broz, Tanja (2016) : Exploring CESEE-EMU Synchronisation Patterns, Amfiteatru Economic Journal, ISSN 2247-9104, The Bucharest University of Economic Studies, Bucharest, Vol. 18, Iss. 42, pp. 255-268

This Version is available at:
https://hdl.handle.net/10419/169000

EXPLORING CESEE-EMU SYNCHRONISATION PATTERNS

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Please cite this article as:
Botrić, V. and Broz, T., 2016. Exploring CESEE-EMU Synchronisation Patterns. *Amfiteatru Economic*, 18(42), pp. 255-268

Abstract
We study the degree of business cycle similarity between the Central and South-Eastern European (CESEE) countries and the Eurozone members. The special emphasis is put on the differences between countries that have already joined the European Union and those that are in different stages of integration. We introduce a specific measure of business cycle synchronisation by comparing the evolution of the growth rates in country pairs and further seek to identify determinants of these synchronisation patterns using pooled probit model. The results of the analysis have indicated that the real effective exchange rate seems to be an important predictor of synchronisation between CESSEE countries and the original Eurozone members. Our results have also indicated that trade becomes important synchronisation factor only for the countries that became EU members during the analysed period. The trade creation possibilities emerging from the common market seem to change the trade patterns in countries that became the EU members during the analysed period and contribute positively to the overall business synchronisation. This result seems encouraging for the EU aspiring countries.

Keywords: business cycle synchronisation, economic integration, Central and South-Eastern European countries, Eurozone

JEL Classification: F15, E32

Introduction

Business cycle synchronisation mitigates life in the monetary union, because central bank has easier task of conducting monetary policy changes if members are in the same phase of the cycle. Most research in this area deals with synchronisation of business cycles within the European Union (EU) and especially within the European Monetary Union (EMU), since this is the largest and most interesting monetary experiment in the world. However, existing research shows that business cycles of either the EU or of the EMU members are not completely synchronised (Lee, 2013). Only the core EU members are showing relatively high synchronisation of their business cycles (Bayoumi and Eichengreen, 1993;

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Lehwald, 2013; Degiannakis, Duffy and Filis, 2014), while the periphery and the new member states are mostly showing lower degree of synchronisation or no synchronisation at all (Darvas and Szapáry, 2008; Broz 2010; Gächter, Riedl and Ritzberger-Grünwald, 2013).

Since business cycles in the EU did not show overall high degree of synchronisation as expected in the literature, researchers became interested in what determines such patterns. Trade was the obvious explanation, because of its role in globalisation process. Due to the expansion of financial markets, diversification opportunities and possible contagion of financial crisis, financial integration shortly became indispensable part of research in this area. Moreover, not only trade and financial integration play important role in determining business cycles, but structural and policy similarities could also be significant determinants. Besides trade, which is mostly found to be a significant determinant of business cycle synchronisation, other determinants in the literature are either not always found significant or could have ambiguous impact.

We study the degree of similarity in up and down phases between the Central and South-Eastern European (CESEE) countries and Eurozone members. The special emphasis is put on the differences between countries that have already joined the European Union and those that are still in different stages of integration. Bilateral relationships are analysed in order to enable the distinctive patterns of each country pairs to evolve separately. This distinction is important, since previous literature on the establishment of synchronisation patterns within the EMU has not been conclusive. Analysis in the paper is focused on the EMU12 countries: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain. CESEE countries included in the analysis are: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, FYR Macedonia, Hungary, Kosovo, Latvia, Lithuania, Montenegro, Poland, Romania and Serbia. The period of analysis covers annual data from 1998 until 2013, during which following countries from our sample gained the EU member status: Bulgaria, Croatia, Czech Republic, Hungary, Latvia, Lithuania, Poland and Romania. Thus, we hypothesise that their synchronisation pattern will be somewhat different to those of late ascenders.

The main contribution relies on the empirical strategy taken to assess the synchronisation of non-EMU CESEE countries with EMU12 countries. Previous studies have heavily relied on explicit growth rates based measures of synchronisation, which created important endogeneity constraints when discussing the importance of specific synchronisation determinants. Due to our simple measure of synchronisation, we are able to include in the analysis a wider set of countries frequently omitted due to unavailable data sources. Secondly, due to the binary nature of our synchronisation measure, it is not a priori assumed that the synchronisation patterns form linear relationships with their determinants.

The structure of the paper is following. The first section briefly reviews the most relevant findings from the literature. Next section discusses the methodology applied in empirical analysis in the paper. Section 3 presents results and provides discussion, while the last section offers conclusions.

1. Literature review

The business cycle synchronisation literature relies mostly on the optimum currency area theory (Mundell, 1961; McKinnon, 1963; Kenen, 1969), which formulates important *a*

priori criteria including high degree of labour force mobility and trade openness ensuring *ex post* symmetrical distribution of economic shocks across the union. Frankel and Rose (1998) proposed that economic integration by itself contributes to more symmetrical distribution of demand shocks and to an increase in intra-industry trade, leading to *ex post* fulfilment of the OCA criteria.

Crespo Cuaresma and Fernandez Amador (2013) suggest that there are four research topics related to the business cycle synchronisation. One strand of literature focuses on the within EMU12 synchronisation. The second question is related to the core-periphery differences in synchronisation patterns. Third issue is focused on the differences between European and global business cycles. The last strand of literature is interested in the recent EU enlargements and the relationship of these countries with the EMU. Our paper aims to contribute to this last segment of the literature by exploring the business cycle synchronisation formation not only of the EU member states, but also of the EU candidate countries.

The focus on the pre-accession countries and their potential convergence issues has been frequently discussed in the literature immediately before and after the countries have joined the EU (Kenen and Meade, 2003; Fidrmuc and Korhonen, 2006; Darvas and Szapáry, 2008). Research mostly shows that only few new member states have business cycles similar to the core EMU members. Traistaru (2004), Fidrmuc and Korhonen (2006) and Darvas and Szapáry (2008) argue that Hungary, Poland and Slovenia have relatively higher correlation of their business cycle with the EMU, while other countries are showing lower degree of synchronisation or even no synchronisation at all. Recent overview by Forgo and Jevčak (2015) on the results of the convergence process of 2004 EU enlargement reports that there are still important issues pending resolutions, some of which should improve the synchronisation in the future.

Regardless of whether there is or there is no evidence of business cycle synchronisation, it is important to consider the issue due to its impact on successful monetary policy implementation. Belke and Schneider (2013) argue that business cycle convergence should be seen as a way to remedy the non-existing business cycle synchronisation. They suggest that business cycle convergence is vital if the EMU would ever be an optimal currency area and consequently it is important to analyse the patterns not only for EMU members but also for the EMU future contenders.

The literature offers several determinants that try to explain business cycle synchronisation. The most commonly used candidate for the transmission channel is trade. However, there are two opposing views on that specific issue. Theoretically, increased trade between countries could cause increased industrial specialisation in sectors with comparative advantage, which leads to asynchronous business cycles. This view is proposed by Krugman (1993). On the other hand, if intra-industry trade between a pair of countries accounts for most of the trade or if demand shocks prevail, then increased trade should lead to increased correlation of their business cycles. This view is proposed by Frankel and Rose (1998) and empirically confirmed by many others (Imbs, 2004; Baxter and Kouparitsas, 2005; Inklaar, Jong-A-Pin and De Haan, 2008). Calderón, Chong and Stein (2007) find that trade has a positive effect on the business cycle synchronisation also in developing countries, although substantially smaller than in industrial countries.

Another important, but less researched, determinant of business cycle synchronisation is financial integration. The assessment of the impact of financial integration on

synchronisation could be an issue, since there are a few possible direct (for example, through financial markets) and indirect effects (for example, through international risk sharing) that might exert contradict effects. Imbs (2004) gives detailed analysis of these effects and presents evidence of positive effect of financial integration on business cycle synchronisation, even though financial integration tends to increase sectoral specialisation. Imbs (2006) and Dinu et al. (2014) for the CEE countries, among others, also confirm the positive impact of financial integration on business cycle synchronisation, while García Herrero and Ruiz (2007) come with the opposite result.

Besides increased trade and financial integration, structural (dis)similarities within a group of countries could explain why countries' business cycles differ in terms of synchronisation. However, it is difficult to identify which fundamental structural characteristics have the impact on business cycle synchronisation. One of them could be the differences in economic structures, where some economies are more specialised than others. Other could be non-economic structural factors, such as geographic position of the country relative to other countries. Using correlation coefficient of value added between the pair of countries and Krugman specialisation index Beck (2013) shows that structural similarities are significant and robust determinant of business cycle synchronisation. On the other hand, Baxter and Kouparitsas (2005) and Böwer and Guillemineau (2006), who also included structural characteristics of economies as determinants of business cycle synchronisation, did not find their effects robust.

Even though synchronisation patterns of NMS-10 raised much research attention prior to and after 2004 EU enlargement, similar exercises are scarce for the most recent EU candidate countries in the South Eastern Europe. To the best knowledge of the authors, similar attempts have been abandoned due to data limitations. Thus, the next section presents alternative solution to provide some insight into this issue for the specific group of countries.

2. Estimation strategy

When discussing business cycle synchronisation, the most important issue is how to identify its occurrence. Literature has proposed different strategies with that regard. Frequently different filtering techniques are proposed (see, for example, Canova, 1998). Another approach relies on identified business cycle turning points (Harding and Pagan, 2002). Methodologies relying on the growth rate correlation patterns have been also developed (Cerquieira and Martins, 2009).

However, there are some disadvantages related to applying these methods to our case. The first obstacle is that they usually rely on the high frequency data, which are not readily available for some of the countries we wanted to include in the analysis. Most of the methods discussed are concerned with identifying reference business cycle and detecting synchronisation with reference country. We decided against this approach since the literature does not univocally claim that within the Eurozone members a business cycle synchronisation pattern persists.

For that reason we introduce a specific measure of business cycle synchronisation relying on the idea of Pearson's corrected contingency coefficient (Garnier, 2003). We first analyse whether in a single country the GDP growth rate is higher in period *t*, than in period *t-1*.

In other words, we aim to identify whether an economy is in the boom phase. If this is the case, regardless of the initial size of the GDP growth rate, then we label this event as true. We analyse this also for the partner country and compare the outcomes of the bilateral growth rate evolution paths. We then compare evolution of the growth rates in country pairs. The possible outcomes are presented below (table no. 1).

Table no. 1. Possible outcomes of growth rate evolution paths

	Country A	
Country B	True, True	True, False
	False, True	False, False

We consider the events of synchronisation when the outcomes are the same in both countries – either true or false. We establish this as a synchronisation period. Other outcomes are labelled as non-synchronisation periods. Thus, we have a binary dependent variable which takes the value 1 if the outcomes are the same, regardless of the direction (positive or negative). If the countries were fully synchronised, we would never observe zero value of the dependent variable. However, the data does not show such pattern.

We further seek to identify determinants of these synchronisation patterns. Following the literature, three sets of determinants are established: trade, financial integration and structural characteristics (see Appendix for data sources).

The most frequently used variable expected to influence business cycle synchronisation is trade. Although trade intensity itself is addressed as important, the evolution of trade patterns in the form of intra-industry trade (IIT) is emphasized as the most important. Furthermore, inclusion of trade intensity variables usually raises the endogeneity issues in the estimation. The dynamics of the intra-industry trade in time is consequently explored with marginal intra-industry trade (MIIT) indicators, which capture the relative changes in trade patterns between two periods. Similar to IIT estimation indicators, the literature proposes various MIIT indicators. We follow the methodology proposed by Brülhart (1994) and calculate MIIT based on the following expression:

$$MIIT_{ijt} = 1 - \frac{\left|\Delta X_{ijt} - \Delta M_{ijt}\right|}{\left|\Delta X_{ijt}\right| + \left|\Delta M_{ijt}\right|} \quad (1)$$

where:

- X - refers to exports and M refers to imports, both of which are on a detailed level of aggregation
- i and j - refer to bilateral country pairs and t refers to the analysed period

The data for calculating the index come from the Eurostat COMEXT database and the analysis has been performed on the level of 8-digit Combined Nomenclature, and then aggregated to the overall bilateral country pairs. This index varies between 0 and 1, where 0 indicates marginal trade in the particular industry to be completely of the inter-industry type, and 1 represents marginal trade to be entirely of the intra-industry type. Thus our initial assumption is that the relationship between synchronisation and marginal intra-industry trade will be positive.

Financial integration is another important determinant of business cycle synchronisation. Increased financial integration should enhance macroeconomic spillovers between

countries, which should lead to more synchronised business cycles (Kose, Prasad and Terrones, 2003). Moreover, financial systems in CEE and especially in SEE countries were underdeveloped compared to the EU15. It has to be emphasized that financial liberalization in the transition economies spurred acquisition of domestic financial institutions by foreign banks, frequently of the EU origin. Although this has been accompanied by the increased efficiency of the financial system, the question of whether it really led to financial integration is also related to the market strategies applied by each financial institution. Specifically, it could be argued that foreign financial institutions support financial integration of the European periphery, if they apply the same business strategies as on their home markets. However, financial institutions might deliberately choose different strategy mix in order to improve their business results, and from their individual business position applying the same strategies across the countries might not be the best policy.

Measuring bilateral patterns in financial integration between countries is relatively difficult task and different authors have come up with different ways how to capture it. Kose, Prasad and Terrones (2006) use dummy variable for equity market liberalisation and the ratio of gross capital flows to GDP, Kose, Prasad and Terrones (2003) use, besides the ratio of gross capital flows to GDP, dummy variable for capital account restrictions, Böwer and Guillemineau (2006) use bilateral capital flows, while Imbs (2006) uses bilateral asset holdings and different variables for exchange restrictions. On the other hand, Lane and Wälti (2006) use price and quantity based measures of financial integration, while Baele et al. (2004) use price, news and quantity based measures. Price-based variables measure differences in prices or returns on assets between different countries and, through the law of one price, are the broadest measure of the financial integration. Since price-based variables for the countries in our sample are available and are relatively homogenous across countries, we included price-based variable – difference in average deposit rates - to account for the possible effects of financial integration. The assumption is that decrease in the difference in average deposit rates should lead to increase in business cycle synchronisation. However, it is possible that spread between deposit rates might be driven by idiosyncratic economic factors beside the financial integration.

Similarity of economic structures should have an impact on business cycle synchronisation (Beck, 2013), but the evolution of their bilateral patterns is probably the most difficult to include with only a simple measure. Frequently used indicators in the literature rely on the differences in value added structure or on the industrial specialization patterns. However, due to data limitations we were not able to use Krugman type specialisation indices. Hence, as a proxy for structural similarities, following Cerquieira and Martins (2009), we use similarity index, which is suitable for annual data and which captures time variability, but without the use of overlapping windows, which could result in autocorrelated variable:

$$similarity_{i,j,t} = 1 - \frac{1}{2}\left(\frac{\left(GDP\ growth\ rate_{j,t} - \overline{GDP\ growth\ rate_j}\right)}{\sqrt{\frac{1}{n}\sum_{j=1}^{n}\left(GDP\ growth\ rate_{j,t} - \overline{GDP\ growth\ rate_j}\right)^2}} - \frac{\left(GDP\ growth\ rate_{i,t} - \overline{GDP\ growth\ rate_i}\right)}{\sqrt{\frac{1}{n}\sum_{i=1}^{n}\left(GDP\ growth\ rate_{i,t} - \overline{GDP\ growth\ rate_i}\right)^2}}\right)^2 \quad (2)$$

Structural changes can also be reflected in other indicators. Frequently discussed issue in transition economies concerns the divergent dynamics of the real effective exchange rates of converging transition economies. Business cycle literature usually either refers to the exchange rate regime or volatility of the exchange rate, the later relying on high-frequency indicators. We include real effective exchange rate (REER) in order to capture structural changes in the economy. As Darvas (2012) points out, this indicator is frequently used in assessing changes of price and cost competitiveness as well as capturing incentives for resource reallocations between tradables and non-tradables.

Ricci, Milesi-Ferretti and Lee (2013) have recently shown that fundamental determinants of real effective exchange rates include relative labour productivity of tradables to non-tradables, terms of trade, net foreign assets position, share of government consumption, trade restrictions and importance of administrated prices in consumer price inflation. All of these factors are significantly changing in the transition economies. The changing role of government either directly in terms of its share in GDP or indirectly through defining price and wage setting mechanisms is precisely the key point of transition process itself. Another issue related to the accession process is the increase in capital flows towards the periphery countries intended to speed their integration in the common market. However, consequences frequently included increased current account deficits as additional funds were not directed into investments, but rather spent on foreign goods revealing and increasing the competitiveness pressures on the domestic producers. Galstyan and Lane (2009) claim that real effective exchange rates should be considered to discuss the issue of relative competitiveness of EMU member states and we extend this view also to the countries aspiring to join the Eurozone.

We include two additional dummy variables in order to capture specific effects. The first is the dummy variable which takes the value 1 when a country joins the EU. The reason for its inclusion is to capture all other possible harmonisation effects that could not be directly measured. Another is border variable, to control for possible neighbourhood spill-over effects. If countries share a border, they might be more induced to adopt similar economic policies, which then influence the synchronisation of business cycles. However, we did not include 2008 economic crisis dummy, due to the construction of the dependent variable, which takes into account simultaneous downward trend in economic growth rates of bilateral pair of countries.

The dependent variable is binary, which leads us to probit estimation. The following model is estimated:

$$Synchro_{ijt} = \alpha + \beta_1 REER_{ijt} + \beta_2 MIIT_{ijt} + \beta_3 Deposit\ rate_{ijt} + \beta_4 Similarity_{ijt} + \beta_5 Borders_{ij} + \beta_6 EU\ dummy_i + \varepsilon_{ijt} \quad (3)$$

where:

- Synchro - the business cycle synchronisation indicator
- REER - real effective exchange rate
- MIIT - marginal intra-industry trade
- Deposit rate - difference in average deposit rates
- Similarity - similarity index

- Borders - border dummy variable
- EU dummy - EU accession dummy variable
- ε - residual
- i and j - bilateral country pairs
- t - analysed period

Descriptive statistics for the variables is presented in table no. 2.

Table no. 2: Descriptive statistics

Variables	Whole sample	EU members sample
	Mean (standard deviation)	
REER	0.99 (0.10)	0.98 (0.06)
MIIT	0.06 (0.06)	0.08 (0.06)
Deposit rates	3.36 (6.60)	2.92 (4.89)
Similarity	-2.40 (1.55)	-1.64 (1.17)

All variables used in the analysis are bilateral and we have 168 bilateral country pairs. We are using annual data and the analysis covers period from 1998 to 2013. However, for some countries in some years the data were not available. Naturally, the largest deficiencies are within the Western Balkan countries region (Montenegro, Kosovo, Serbia), which have become independent only since the middle of 2000s.

Our initial estimation strategy entailed panel random effects model relying on Butler and Moffit (1982) derivation, which assumes the random effects to be uncorrelated with the explanatory variables. However, in all cases rho estimates were low and suggested that panel level variance component is not important. Thus, we continued with pooled estimates which means that we can benefit from the largest possible dataset.

The synchronisation patterns are expected to be more pronounced in bilateral relationships of countries well integrated with the European Union. To that end, we reduce the overall sample to only those countries that during the analysed period became full members. These EU member states consequently include Bulgaria, Croatia, Czech Republic Hungary, Latvia, Lithuania, Poland and Romania. The comparative approach has been followed and both sets of estimates are discussed in the following section.

3. Results and discussion

We analyse the bilateral synchronisation patterns between the original Eurozone members and those who have not adopted the Euro during the analysed period. Thus, we exclude from the analysis the countries such as Estonia or Slovenia, due to their dual nature in the analysed period. The probit model, without a panel structure, enables inclusion all the country-year data available in the estimates. The benefit is that we are able to provide some evidence also for countries frequently omitted from the empirical analysis due to data limitations. We estimate the model for the whole sample as well as for the "EU members" sample, which includes the countries that have joined European Union sometimes during the 2004-2013 period. The results are presented in table no. 3.

Table no. 3: Predicting the synchronisation pattern

Explanatory variables	Whole sample	EU members sample
	Estimated coefficients (robust standard errors)	
Constant	2.80*** (0.63)	4.04*** (0.73)
REER	-2.57*** (0.63)	-3.96*** (0.73)
MIIT	0.68 (0.58)	1.76** (0.69)
Deposit rates	0.01 (0.01)	-0.00 (0.01)
Similarity	-0.05** (0.02)	-0.02 (0.03)
Borders	-0.12 (0.13)	-0.18 (0.17)
EU dummy	0.09 (0.07)	0.20** (0.08)
Diagnostics		
Number of observations	1922	1220
LogL	-1193.08	-757.37
Wald chi2(6)	24.25***	44.37***
Hosmer-Lemeshow chi2 (8)	4.17	7.67
Prediction (%)	67.59	65.74

Estimated models have relatively good properties. The variables are jointly significant, the Hosmer-Lemeshow statistics is adequate and the overall prediction percentages of the models seem satisfactory. Disaggregated overall prediction shows that sensitivity is relatively high and the specificity is relatively low. Thus, chosen variables are more likely to accurately predict synchronisation than non-synchronisation occurrence.

The variable that is significant in both estimates is REER. Since the main trading partner of CESEE countries is the European Union, it could be assumed that the euro dominates the trading basket of currencies. The results show that appreciation in real terms decreases the probability that cycles will synchronise. D'Adamo and Rovelli (2015) recently discussed the role of exchange rate in convergence process of catching-up countries. They suggest that premature adoption of a fixed exchange rate regime might contaminate wage and price setting mechanisms in the tradable sector and consequently lead to loss of competitiveness. Coudert, Couharde and Mignon (2013) argue that this is not necessarily the case if appreciation is related to the improvements in economic fundamentals, such as labour productivity. Nevertheless, convergence in labour productivity levels means that less developed countries grow faster and through Balassa-Samuelson effect have appreciated REER, since prices of non-tradables increase due to the increased productivity in the tradable sector. These price changes negatively affect competitive positions of catching-up countries and contribute to open external positions which demand financing. In those circumstances, structural changes of catching-up economies require different policies than EMU12 economies, and such policy measures have large potential to lead to asynchronised business cycles between them.

It is interesting to notice that the similarity indicator coefficient we have introduced is relatively small, but significant in the overall sample. It seems that it indicates that similar countries in terms of economic size are less likely to have similar economic cycles. These results, combined with previous observations, indicate that we have to consider structural factors important for each country. Although this finding seems relatively straightforward, it is frequently neglected in public policy discussions. Similar argument is for the non-significance of the border dummy. It could be argued that economic cycles in the neighbourhood should influence the dynamics in a country; however, this effect cannot be fully captured by the border dummy. Precisely geographical proximity, size of an economy and historical factors have been recently emphasized by Stanisic (2013) as potential explanatory variables behind some identified co-movements in business cycles of CEE countries.

It is interesting to note that for the EU members sample, we have established that the actual period when they became full members is positively associated with the likelihood that the business cycle will be synchronised, which is similar result to Gächter, Riedl and Ritzberger-Grünwald (2013). This finding could be attributed to the *a posteriori* argument of the integration theory. We have also found that for these countries the trade patterns play important role in the business cycle synchronisation.

Although financial integration has been analysed from many aspects, our simple measure of interest rate distances did not prove important for business cycle synchronisation, similar to Böwer and Guillemineau (2006), who did not obtain robust results for interest rate differentials. Coudert, Couharde and Mignon (2013) provide explanation behind relative inefficiency of financial integration within the EU members. They suggest that capital flows towards EU periphery, instead of improving production, increased consumption, fuelling inflation (in particular in non-tradable sector) and contributed to the real-estate bubble formation.

Marginal effects enable discussion related to the strength of the individual predictors, since they reflect a change in the probability in dependent variable related to a unit change of the independent variable (table no. 4). Although not many variables have been found significant, it can be seen that possible negative effects from the exchange rate appreciation outperform the potential positive effect of the EU membership and changes in the trade patterns. On the other side, if the whole sample is considered, than none of the positive effects seem to be significant. Although we do not provide separate estimates for the SEE countries (due to the relative lack of data sources for the whole period) implicit conclusions seems to be that the overall estimates are additionally burdened by the negative patterns occurring in these countries.

Table no. 4. Marginal effects

Explanatory variables	Whole sample	EU members sample
REER	-0.92***	-1.43***
MIIT	0.24	0.64**
Deposit rates	0.00	-0.00
Similarity	-0.02**	-0.01
Borders	-0.04	-0.07
EU dummy	0.03	0.07**

The initial hypothesis that there are differences in synchronisation patterns between the countries that have already joined the EU and other countries has been confirmed by the data. There are, of course, limits of our analysis and there are other possibilities that might be explored. Literature has established many possible factors behind convergence, such as total factor productivity growth and capital deepening (Borys, Polgár and Zlate, 2008), fiscal stance (Mencinger and Aristovnik, 2013), inflation targeting (Rose, 2009), social and institutional factors (Rupasingha, Goetz and Freshwater, 2002) and private and public capital accumulation and education (Leonida and Montolio, 2004). However, for our specific sample, data constraints are not adequate enough to enable deeper insight into these factors. Hence, these issues are left for future research endeavours.

Conclusion

Business cycle synchronisation literature is predominately concerned with the Eurozone members and questions related to *a priori* and/or *ex post* synchronisation conditions. We extend the focus on a wider set of countries, having in mind their determination to join the European Union, and subsequently introduce the common currency.

The results of the analysis in the paper have indicated that the real effective exchange rate seems to be an important predictor of synchronisation between EU aspiring countries and the original Eurozone members. We consider the REER as an indicator not only reflecting monetary policy differences between two countries, but rather capturing a wider set of structural imbalances related to price and wage setting mechanisms that contribute to the relative loss of competitiveness of the EU aspiring countries.

Our results have also indicated that trade becomes important synchronisation factor only for the countries that are relatively more integrated. The trade creation possibilities emerging from the common market seem to change the trade patterns and contribute positively to the overall business synchronisation. This seems encouraging also for the EU aspiring countries.

Business cycle synchronisation remains an open research question within the European integration process. The issue is important not only for Eurozone members, who have already the obligation to follow the same monetary policy, but also for the future EU members. There are two aspects of future research endeavours in that respect, both pending the creation of quality database for SEE countries. The first one requires high frequency indicators in order to identify business cycle paths with more precision. The second entails investigating other potential determinants of business cycle synchronisation, including structural changes and policy measures, such as fiscal coherence and ERM membership.

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Appendix

Data sources for original variables

Variable	**Description**	**Source**
GDP	Real GDP in euros (constant 2005 prices)	WDI, Eurostat
GDP growth rate	Real GDP growth rate (constant 2005 prices)	WDI
Exports, imports	Bilateral volumes and quantities	COMEXT
Deposit rates	Average deposit rates	IFS, ECB
Border	= 1, if border is either on land or see	Various Internet sources
Euro dummy	= 1, if both countries are members of European union	Various Internet sources
REER	Real effective exchange rate index (deflated by consumer prices), 2010=100	WDI