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Economic Modelling

Euro or not? Vulnerability of Czech and Slovak economies to regional and international turmoil☆

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ABSTRACT

The paper compares vulnerability to crises of the Czech Republic and Slovakia, which had operated as Czechoslovakia prior to 1993. In 2009, Slovakia adopted the euro, while the Czech Republic retained its koruna. The main research question is if the introduction of the euro made Slovakia more vulnerable to pan-European crisis. The paper concentrates on two episodes: the Greek (pan-European) and Hungarian (regional) turmoil. The level of the country risk is measured through volatility of bond-spreads. From DCC-copula model the authors derive time-varying probability of crisis transmission and dynamic correlations. The main findings of the paper are: (i) Euro adoption did not make Slovakia more vulnerable to the pan-European problems. (ii) The country is still identified by investors as an emerging Central-European region, rather than a country of the Eurozone.

1. Introduction

The aim of our research was to verify vulnerability of the Czech and Slovak economies to the transmission of financial crises based upon the behaviour of their sovereign bond spreads. The Czech and Slovak economies are Central-European Economies. Prior to 1993 the two republics in question used to be single economic space. Later on, i.e. in 2009, Slovakia, already as an independent economy, adopted the euro as its currency. At the same time, the financial crisis started to spread from the USA to Europe, as a result of which several member states of the Eurozone experienced severe economic and fiscal breakdowns. Economic problems were no strangers to Hungary either, which is an important country in the region of Central Europe. These crises affected the way investors rated their risks in the other economies in the whole of Europe or in the sub-region. Our goal is to verify the direction and strength of transmission of these two crises to the two economies in question.

The euro is the official currency of the Eurozone. It is managed and administered by the independent European Central Bank. Any EU state that aims at adopting the euro has to comply with special financial and budget constraints. Of the Visegrad Group (hereinafter: V4) countries

only Slovakia adopted the euro, following their successful implementation of structural reforms. The euro was supposed to bring stability by preventing devaluation that had been a result of self-fulfilling runs on currency. The introduction of the euro meant also that countries with sovereign debt problems could not use monetization and devaluation as a way to prevent default (see: Whelan, 2013). Together with the outbreak of the financial crisis, the economic situation of some Eurozone members began to deteriorate. The countries with a high level of debt and dependent on the inflows of private credit seemed to have found themselves in the worst situation (Spain, Ireland). Fundamentals of some other countries had been poor even before the crisis (Portugal). Eventually, in the case of Greece, not only had the fundamentals been in poor condition, but also the statistics about them had been falsified. Revealing the "true" value of the debt ratio aggravated the international evaluation of the Greek condition.

The impact of the exchange rate regime on vulnerability of the economy to the crises has already been studied thoroughly. For instance, Holtemoeller and Mallick (2013) showed that the higher flexibility of the currency regime is, the lower the misalignment of actual real effective exchange rate from its equilibrium level, and thus – the probability of a potential currency crisis. Misalignment occurs

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when the actual exchange rate does not respond adequately to changes in the economic fundamentals. Since the euro is a single currency shared by many European economies with very different fundamentals, we claim that there was a possibility of such misalignment in the case of Slovakia. Being a small Eurozone member, it was unlikely to have affected the euro exchange rate. On the contrary – the fundamentals of other distressed economies could have accomplished that. The measures taken by the European Central Bank, as well as the European Commission, imposing burdens on other countries to help Greece, could have affected not only the deficit of Slovakia but also the investors' sentiment about the country.

Many authors have drawn attention to the reaction of Western economies to the Greek problems. For instance, Gomez-Puig and Sosvilla-Rivero (2016) indicated that before the crisis of the peripheral Eurozone members, the bond spreads of the European Economic and Monetary Union (EMU) countries with respect to Germany moved in a narrow range with only slight differentiation across countries. However, they spiralled, starting from November 2009. The authors presented a correlation matrix between the yields spreads, showing that correlations with Greece ranged from 0.96 (Portugal) to 0.54 (Finland). Thus, the natural question is whether the Slovak Republic, being a young Eurozone member, followed the path of the South-Western members or remained more immune to the Mediterranean problems, as it was the case with the northern economies (Finland, Netherlands).

Therefore, our first research question is: was the influence of the Greek crisis more severe to Slovakia than to the Czech Republic?

At the same time Hungary, one of the Central-European economies, but not a Eurozone member, also experienced its own crisis. Slovakia, with the new currency, could have become more immune to Central-European problems and thus may be associated by investors with Western Europe rather than with Central Europe. On the other hand, according to specialist literature one of the crisis-transmission channels is actually region-based, i.e. crises can spread more easily in the economies in the same region (see e.g. Crescenzi et al., 2016). The reason for this could originate from international investors themselves and their withdrawals of investments from several financial markets (Fazio, 2007), especially when one of the countries in the region is on the brink of crisis. Given the scarcity of information, investors are prone to treat the seemingly similar countries as equal (e.g. Dieder et al., 2008). In view of the fact that the Czech and Slovak Republic used to be one country, we can suppose that uninformed investors could have treated them as equal and painted them with a broad brush. As they belong to the CEE region, the news of the Hungarian crisis could have made investors lose their confidence in the other CEE countries. On the other hand, if the investors had been aware of the fact that Slovenia is one of the Eurozone members, they could have already been treating it differently.

The reaction of the Czech Republic to the Hungarian crisis is also unclear. For instance, Buettner and Hayo (2010) showed that the Czech Republic can be viewed by investors as more advanced in terms of real and nominal convergence; from the perspective of the CEE markets the most integrated seem to be the Polish and Hungarian economies. Having assessed the reaction of the two economies to the Hungarian crisis we can also attempt to answer the question how international investors treat the two economies: still as risky emerging markets or rather – as similar to the more developed Western economies. Hence, we asked ourselves a question whether the reaction of investors was any different in the case of the two countries.

Therefore, our second research question is: did the Hungarian crisis spread to the Czech Republic, having left Slovakia unaffected?

In our study we have concentrated on bond spreads. Spreads of the bonds to the yield of the safest economy in the region are treated as indicators of the country's risk relative to the safest country in the region. D'Agostino and Ehrmann (2014) showed that in the case of spread of any country relative to a "safe haven" government bond (e.g.

Germany), a country's fundamentals constitute a considerably more influential determinant of spread dynamics than fundamentals of the benchmark economy. Researchers confirm that the importance of fundamentals in bond spread pricing increased especially during the financial crisis (e.g. Bernoth and Erdogan, 2012 or Borgy et al., 2011). Moreover, many studies proved that bond yields are much less vulnerable to sunspots and volatility spillovers from abroad than any of the daily-priced instruments (see e.g. Kocsis, 2014,[1] Będowska-Sójka and Kliber, 2013).

We have analysed the influence of the Greek and Hungarian crises on the Czech and Slovak economies by studying common dynamics of their volatilities. To estimate the volatilities, we have used the DCC-copula model. Such an approach also allowed us to obtain the dynamics of the rank correlation coefficient, the Kendall τ, as well as the tail dependence coefficient (λ). The latter is especially important to our analysis as it has provided us with information about the possibility of transmission of extreme events from high-risk countries.

Contrary to our expectations, it has turned out that Slovakia, despite adoption of the euro, was more immune to the Greek crisis transmission than the Czech Republic. What is interesting, however, is that the two economies seemed to have been similarly exposed to the Hungarian crisis. The key points in the Hungarian policy, resulting in the growth of the Hungarian spread, were reflected in the correlation and probability of extreme events transmission. Moreover, the inter-dependencies between the Czech Republic and Slovakia grew in unison with the evolution of the crisis.

The structure of the article is as follows: first, the data used in the study are presented, i.e. bond spreads of the Czech Republic, Greece, Hungary, and Slovakia over the period 2009–2012, together with descriptive statistics. Next, the model used in the study is described: the DCC-copula. Finally, the results of our model are recounted and interpreted.

2. Literature review

The negative impact of the Greek crisis on other developed European markets has been studied by many researchers. For instance Samitas and Tsakalos (2013) confirmed contagion between Greece and UK, Germany, France and so-called PIIGS economies based upon the analysis of the main stock indices. Phillipas and Siriopolous (2013), using the Markov-switching and copula approach, also confirmed contagion from Greece to France and Germany. Gomez-Puig and Sosvilla-Rivero (2014) showed that causality relationships between Greece and Western European Economies (France, Austria, Finland and Belgium) grew in response to Greek crisis. The results presented by the authors linked the probability of spillovers to high exposure of these banks (e.g. French, German) to the debt of peripheral countries. As a response to Greek problems, the 1-year yield spreads of French, Austrian, Finish and Dutch bonds over the German ones grew significantly, while their ratings remained high. The authors associated the increase of the spreads with the herd behaviour of investors and the growth of risk aversion. In their later study (Gomez-Puig and Sosvilla-Rivero, 2016) they confirmed that the growth of sovereign risk premium in the euro area during the European sovereign crisis was caused not only by the deterioration of debt sustainability in member states, but also by the perceptions of market participants in contagion episodes from peripheral (among others: Greece) to central countries.

On the other hand, Pragidis et al. (2015) found no contagion between Greece and the aforementioned economies based upon the analysis of bond spreads of 10-years maturity. According to Kalbaska and Gątkowski (2012), up to 2010 the Greek sovereign credit default

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[1] According to this study, in the case of Hungary the idiosyncratic factor can explain up to 80% of the variance of bond yields, while in the case of sovereign CDS this figure is only 33%.