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Determinants of Sovereign Risk Premiums for European Emerging Markets (From Saints and Sinners?)

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Determinants of Sovereign Risk Premiums for European Emerging Markets (From Saints to Sinners?)

Mirna Dumicic and Tomislav Ridzak

Abstract

From the economic policy perspective, it is highly important to identify and understand the driving forces for sovereign spreads. Countries that use international markets to cover their financing needs should be aware of the relative contribution of the factors under the influence of economic policy tools, as well of those not controllable by domestic policy-makers. Also, prolong periods of low international risk premiums can contribute to the build-up of significant external imbalances and misallocation of resources. This paper tests to what extent the recent turbulence affecting sovereign bond spreads could be attributed to changes in market sentiment and what was the role played by domestic fundamentals, and especially external imbalances. Results confirm that spreads dynamics can mostly be explained by risk appetite, macroeconomic fundamentals vulnerability and the EU accession process. However, external imbalances became increasingly significant as the crisis broke out.

Keywords: sovereign spread, emerging markets, Central and Eastern Europe, market sentiment, fundamentals

Introduction

Funding costs for all Central and Eastern European countries (CEEC's) generally moved in the same direction as they steadily trended downwards during most of the past decade. After major deterioration of the global economy following the turbulence in the US sub-prime mortgage market and especially in the aftermath of the Lehman collapse, investors' risk aversion shoot-up raising funding costs of the CEEC's. In addition, as investors have started to differentiate countries they perceived to be more risky from those identified as less risky, the cost of financing for some countries in the region increased significantly, while required yield increase for the other countries was not as pronounced.

The spread on the bond should represent the investors' perception of the issuers' risk and perspective in context of its future economic performance. Except affecting the cost of government debt, the spread is also an important reference for all private sector loans, mostly because private issuers face the same macroeconomic risk as the sovereign, and is used in cross border valuation studies as a country risk premium (Damodaran (2010) gives a short survey of possible cross border valuation methods).

Countries that use international markets to cover their financing needs should be aware of the relative contribution of factors that are under the influence of economic policy tools, as well of risks that are not controllable by domestic policy-makers. The same is truth for those that tap the pool of foreign savings to fund private investments as increases in bond spreads spill into interest rate hikes for the private sector. These reasons place identification and understanding of the driving forces behind sovereign spreads high among the policy issues, justifying a recent surge in the literature.

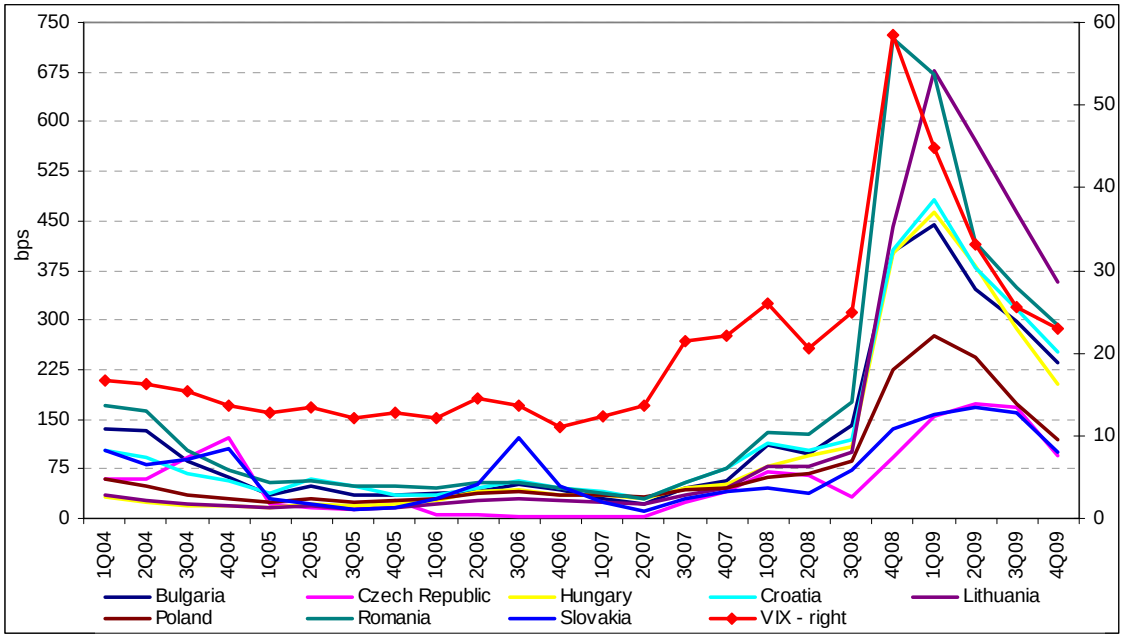
The area of our special interest is Central and Eastern European region[1] which went through the period of rapid growth and became increasingly integrated into the EU structures during the observed period. In some countries this process resulted in building up of significant external imbalances, which were mostly perceived as a normal part of convergence process, at least by the financial markets, and at the time did

[1] Countries included in our analysis are Bulgaria, Croatia, the Czech Republic, Hungary, Lithuania, Poland, Romania and the Slovak Republic.

not result in higher required yields. All this was happening against the backdrop of relatively benign international financial conditions that have radically deteriorated as the crisis broke out. As Luengnaruemitchai and Schadler (2007) show, the spreads on foreign borrowing for new EU member states countries were lower than implied by economic, financial and political fundamentals. Their tentative conclusion was that policy anchors brought by the EU accession might be a reason behind it.

As Figure 1 shows, the cost of borrowing in international markets paid by emerging market countries steadily trended downwards, at least until the very recent period. At the same time, the global risk perception of investors was sharply reduced, decreasing also the global risk premium. These trends were reversed in the second half of 2007 with the emergence of problems in the US sub-prime mortgage market, while the escalation of the crisis after the Lehman Brothers collapse in late 2008 triggered run into the quality and a drastic rise in required yields on emerging market eurobonds.

Figure 1 Spreads on Emerging Market Sovereign Debt (JP Morgan EMBI spreads), VIX Index



Source: Bloomberg and JP Morgan

After market conditions hugely deteriorated, investors' behavior changed compared to the previous period and the spread compression that was in progress since 2004 quickly disappeared, with differentials between the countries rapidly expanding. The cost of

financing for some countries in the region increased significantly, while required yield increase for the other countries was not as pronounced. The question is to what extent such developments in yield spreads are attributable to changes in macroeconomic fundamentals, which can be influenced by economic policy, and how much are they affected by investors' risk aversion.

Literature review

The interest in determinants of the cost of financing is not new and it is common that this topic becomes especially interesting during the periods of turmoil in financial markets and real economy. In order to explain spread behavior the authors that tackled this issue included in their models different macroeconomic fundamentals, the government finance indicators, external liquidity indicators, political social and legal factors and financial market related variables. Additionally, some authors, i.e., Hartelius, Kashiwase and Kodres (2008), use credit ratings as a proxy for all available country fundamentals

Based on the data of about one thousand bonds issued by developing countries, Eichengreen and Mody (1998) tried to investigate how much of spread variations could be explained by fundamental factors in comparison to the influence of the general market sentiment. According to their results, economic fundamentals do not seem to be the main driving force of the spread movements over time, suggesting they are highly influenced by the market sentiment.

Somewhat different result on the relative importance of relevant factors was reached by Ferrucci (2003) who also investigated determinants of spreads on emerging market bond issues and tried to discover how much of the spread changes could be explained by changes in fundamentals. The panel of EMBI data and macro-prudential indicators was estimated by using the pooled mean group technique and the main conclusion is that spreads are highly influenced by fundamentals, but that non-fundamental factors definitely cannot be neglected, especially the market sentiment.

In recent years some papers have dealt with the Central and Eastern European countries in the context of their EU accession process. Luengnaruemitchai and Schadler (2007)

point out that EU accession might have a positive impact on spreads, which is also known as "EU halo effect". They do not model this explicitly, but rather include a variable that describes political progress of the country

In order to analyse the role of fundamentals in spread determination for government bonds of eight new EU member states, Alexopoulou et al. (2009) used a dynamic panel error correction model. They concluded that external imbalances, fiscal balance, exchange rate, inflation, degree of trade openness and short-term interest rate spreads influence the cost of funding for these countries in a long run. They also divide countries in two sub-groups and emphasize the importance of fiscal fundamentals for countries with high external imbalances.

Due to the fact that movements of spreads on different emerging market bonds usually have similar patterns, it could be concluded that they are in a great manner determined by one or more common forces. McGuire and Schrijvers (2003) used principal component analysis to identify these factors and tried to find their use in understanding and forecasting economic movements. Similar approach was also used by Sløk and Kennedy (2004) who differentiate between the two main factors in explaining the changes in spreads. The first one is based on an individual perception of the borrowers' economic conditions and the second one is related to the general economic conditions mostly marked by low interest rates that generated abundant liquidity and encouraged investors to go for a "yield hunt" which caused a sharp decrease of the risk premium. They find there are other factors than those country-specific ones that caused lowering spreads on emerging market debt.

From the literature surveyed here we can conclude that both market sentiment and macroeconomic fundamentals determine the spread movements. In addition to that, authors researching the new EU member states stress out positive impact of the EU accession process.

Data and expected results

Our panel consists of the data for eight CEEC's for the period between the first quarter of 2004 and the last quarter of 2009. The countries are: Bulgaria, Croatia, Czech

Republic, Hungary, Lithuania, Poland, Romania and Slovak Republic. The period selection was determined by data availability and quality issues.

The JP Morgan Euro EMBI Global indices and interest rates on long term government bonds (for Czech Republic and Slovakia) were used as indicators of yield spreads for observed countries, as they are considered to be reliable indicators of yield movements and total returns for emerging market bonds. To ensure their representative quality and mutual comparability, the EMBI indices include only euro-denominated, straight fixed coupon bonds issued by sovereign and quasi-sovereign entities with a remaining maturity of over 2.5 years. In order to assure that prices of the instruments included are reliable, JP Morgan requires that brokers and dealers in the secondary market regularly quote them.

Explanatory variables can be divided in four groups. The first group relates to the macroeconomic indicators. We used the real GDP growth rate and inflation as a measure of overall credibility of economic policies. The second group of factors includes indicators of sovereign and external solvency, such as growth rate of the total external debt, growth rate of government debt, change in share of external debt in GDP, change in general government debt to GDP ratio, current account balance to GDP, exports-to-GDP ratio, imports to GDP ratio and ratios of imports and exports to international reserves. These data were obtained from Eurostat, except for the external debt data that were gathered from The Quarterly External Debt Database, jointly developed by the World Bank and the International Monetary Fund. As the data frequency is quarterly, when needed, the X-12 quarterly seasonal adjustment method developed by U. S. Census Bureau was used to smooth the series.

When investing in government bonds, investors are interested in countries' economic performance, which largely determines the government's ability and willingness to repay the debt at maturity. In other words, it is similar to investing in corporate bonds, with difference that it is very difficult or sometimes impossible to force government to receivership. This is why investors look at fundamentals with great caution. Economic theory implies that lower growth and worsening fiscal balance should increase risk and consequently returns demanded by investors to hold the debt of a particular country. If government issues too much debt, it may have a stronger incentive or could be forced to

default on the debt as investors refuse to roll-over maturing debt. Hence, higher government debt increases the risks and consequently costs of that debt.

The logic behind external sustainability is slightly different - although government does not necessarily have to finance it's debt abroad and the link between government spreads and interest rates on external borrowing does not have to work both ways, lack of domestic savings could make it harder to obtain funds in case of a decline in capital inflows due to changes in the investors sentiment or views on country's external sustainability. Both sustainability of government and external debt depend on the growth rate of economy through simple accounting identity: if interest payments on debt as a share of GDP become bigger than growth rate of nominal GDP, the level of debt has to increase. This is impossible in the long run, as it would imply a country can effectively run a Ponzi scheme. Therefore we expect positive and significant relationship between GDP growth, which can signal change in the debt sustainability outlook, and negative relationship between debt indicators and country spreads.

The third factor we used reflects the EU and EMU convergence process. Although eurozone membership proved insufficient both in disciplining member states and providing them with the shelter from the market sentiment (except maybe in the early days of the monetary union), for the observed group of countries it can be expected that EU and EMU accession process improves the credibility of macroeconomic policies, which is then manifested in a lower required yield on government debt. To take account of the EU accession process a variable was constructed to describe the progress in EU and EMU. Within the accession process, five steps in institutional integration were identified: application for membership, beginning of negotiations, accession to the EU, entry to the ERM II and introduction of the euro as the national currency. Each step increases the index by 0.2, meaning that index level of 0 represents no institutional relationship with the EU and index level of 1 represents EMU membership.

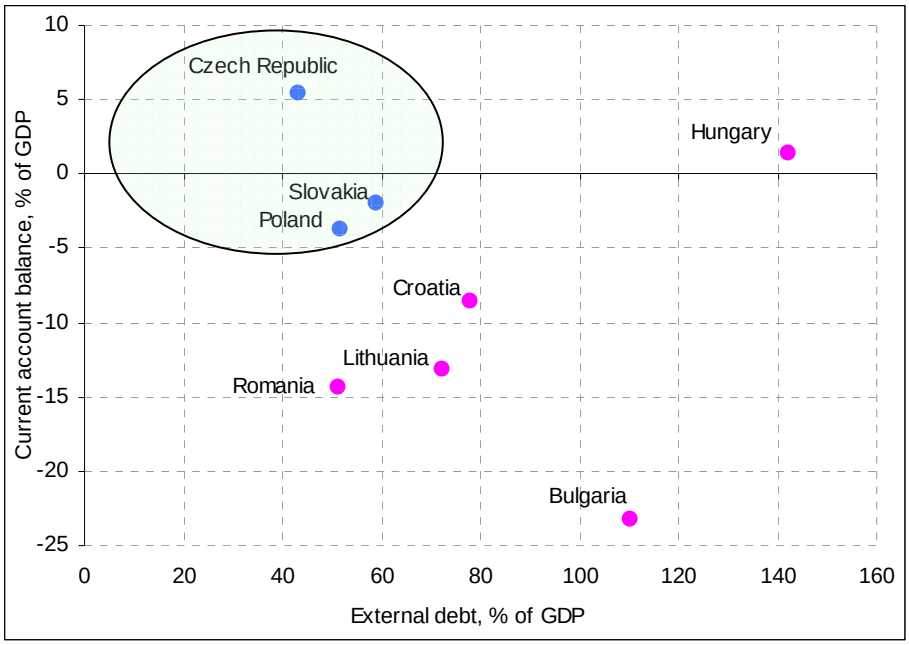
The Chicago Board Options Exchange Volatility Index (VIX) represents the global risk perception. It measures implied volatility of S&P500 index option prices and is often referred to as the fear index or an indicator of investors' risk aversion. This index's level was relatively low in recent years, but sharply rose at the onset of the crisis. It is

expected that the rise in global risk perception increases risk premium on emerging market bonds. The values are quarterly averages of daily data.

High degree of financial market globalisation in recent years increased the correlations between prices of various types of assets. Therefore, it is expected that movements in global financial variables could strongly affect yield spreads, particularly in the short run.

Interaction term between change in VIX index and external vulnerability indicators was also included in some specifications in order to check the extent to which growing dispersion between spreads results from stronger differentiation between the observed countries rather than general increase in risk aversion. A special attention has been given to external imbalances, which have played a prominent role in speculations on the imminent financial collapse of many countries in the region. This term should pick up any non-linearity that might exist between external imbalances and market sentiment. The intuition behind this is that in times of tranquillity markets might ignore external vulnerabilities and when the risk aversion increases these fundamentals become important. Other way to pick interactions is to dummy-out vulnerable countries, so in some specifications we have also included dummy variables GROUP. Variable GROUP has a value of 1 for each of the advanced transition countries (Czech Republic, Poland and Slovakia) that had significantly lower external vulnerabilities than the remaining countries in the sample (Figure 2)

Figure 2 External vulnerabilities, Q3 2008



Source: Eurostat; The World Bank and IMF Quarterly External Debt Statistics

Estimation and results

A model applying three groups of factors was assessed to determine the extent to which changes in logarithms of spreads can be explained by available quantitative variables. Due to relatively short time span of the dataset for each particular country (24 quarters) the estimation strategy was to pool observation for all the countries together, so each observation represents one "quarter-country" pair. By doing this we assume equal response of spread changes to explanatory variables for each country. Due to the nature of the data at hand, it is reasonable to assume that errors among the countries (cross sections) might be correlated, so large errors for one country will often be associated with large errors for another country at quarter t. As a solution for this problem we used the seemingly unrelated regression approach where the covariance matrix is estimated by feasible generalised least squares.

Table 1 gives the estimation results from several specifications we employed in our analysis. Results broadly confirm economic theory and our expectations. Changes in market sentiment and risk aversion significantly influence changes in country risk premium demanded by financial market participants. Macroeconomic performance also matters, as the markets are not myopic with respect to macroeconomic performance, and

the same applies to external imbalance indicators. European Union accession process seems to be important way how countries can diminish their cost of financing.

Table 1 Estimation results

Specification	**1**	**2**	**3**	**4**	**5**	**6**
C	0,05	0,01	0,00	0,01	0,02	0,03
	[1,39]	[0,13]	[0,10]	[0,30]	[0,36]	[0,99]
% change in VIX	1,11	1,09	1,06	1,04	0,99	1,23
	[9,20]**	[10,39]**	[8,31]**	[7,31]**	[5,86]**	[9,51]**
GDP growth rate (t-1)	-0,93	-1,21	-1,19	-0,98	-0,95	-0,78
	[-2,34]*	[-2,54]*	[-2,42]*	[-2,17]*	[-2,12]*	[-2,01]*
Consumer price index (t-1)	0,01	0,02	0,02	0,02	0,01	0,01
	[1,19]	[2,31]*	[2,43]*	[2,41]*	[2,27]*	[1,58]
Change in share of government debt in GDP (t-1)	0,02	0,01	0,01	0,01	0,01	0,02
	[2,50]*	[1,01]	[1,00]	[1,26]	[1,30]	[2,47]*
EU effect	-1,14	-1,1	-1,12	-1,08	-1,09	-1,1
	[-4,13]**	[-3,15]**	[-3,23]**	[-3,26]**	[-3,29]**	[-4,05]**
Change in share of central bank reserves in GDP (t-1)	-0,34	-0,28	-0,3	-0,21	-0,23	-0,31
	[-2,06]*	[-1,35]	[-1,37]	[-1,05]	[-1,15]	[-2,01]*
GROUP	-0,03	-0,01	-0,01	-0,01	-0,01	
	[-0,96]	[-0,20]	[-0,20]	[-0,39]	[-0,42]	
Change in current account deficit share in GDP	-0,01					
	[-0,81]					
Growth rate of external debt (t-1)		0,25	0,27			
		[0,75]	[0,78]			
Change in share of imports in GDP (t-1)		0,01				
		[0,66]				
Change in share of exports in GDP (t-1)		-0,01				
		[-0,70]				
Current account share in GDP (t-1) × % change in VIX			-0,004		-0,004	
			[-0,45]		[-0,55]	
External debt in GDP (t-1) × % change in VIX				19,48	24,43	
				[0,61]	[0,75]	
% change in VIX × GROUP						-0,22
						[-2,59]*
Observations:	191	164	164	166	166	191
R-squared:	0,43	0,52	0,52	0,51	0,51	0,43
F-statistic:	17,04	16,87	18,23	20,1	17,79	20,1

The global risk premium (measured by the VIX index) exerts the strongest influence on the dynamics of sovereign borrowing costs. One percent change in VIX moves EMBI spreads for the roughly same amount. The assessed model shows that sudden changes in required yields can be attributed to a large extent to changes in this variable, which explains most of the deterioration seen at the end of 2008.

Accession into the EU and EMU strongly narrows the yield spreads of the acceding country. Given the length of the period from the beginning of accession negotiations

until the euro adoption, which can take more than a decade for some countries, it cannot account for short-term fluctuations (except maybe on the days when decision announcements happen), but it can explain some of the differences in required yields among countries. Usual explanation of this development found in literature is that a country's convergence to the EU improves its credibility in the international financial market as investors assume that the country will implement prudent macroeconomic policies to maintain imbalances at a sustainable level. Our results show that additional step in EU accession lowers spread on average for about 20%.

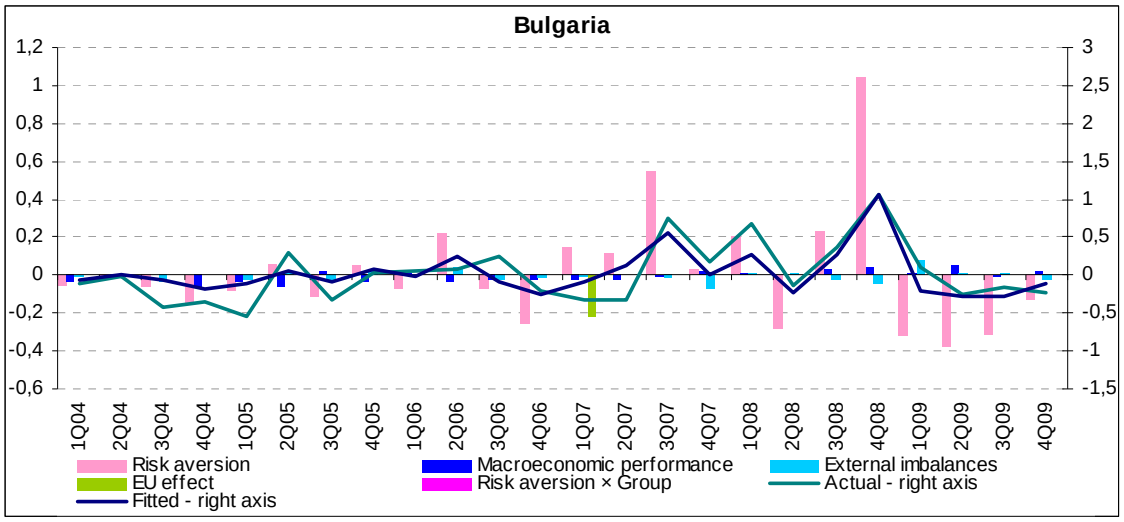
Looking at the regression results we could conclude that external vulnerabilities did not exert economically significant influence on changes in spreads, implying that markets were myopic to these indicators. However, the economic and statistical significance of interaction variable between per cent change in VIX and group of countries with lower external imbalances shows that countries in our sample can be divided in two groups. By looking at the fundamentals, it seems that the main difference between these two groups of countries comes from their external vulnerabilities. As shown in Figure 2, these countries have had much higher share of foreign debt to GDP and bigger current account deficit. Results show that the group with lower external imbalances was rewarded by the markets. In other words, it could be concluded that the markets differentiate these countries in times of distress. When VIX doubles, the countries in this group on average experience 20% lower spread increase.

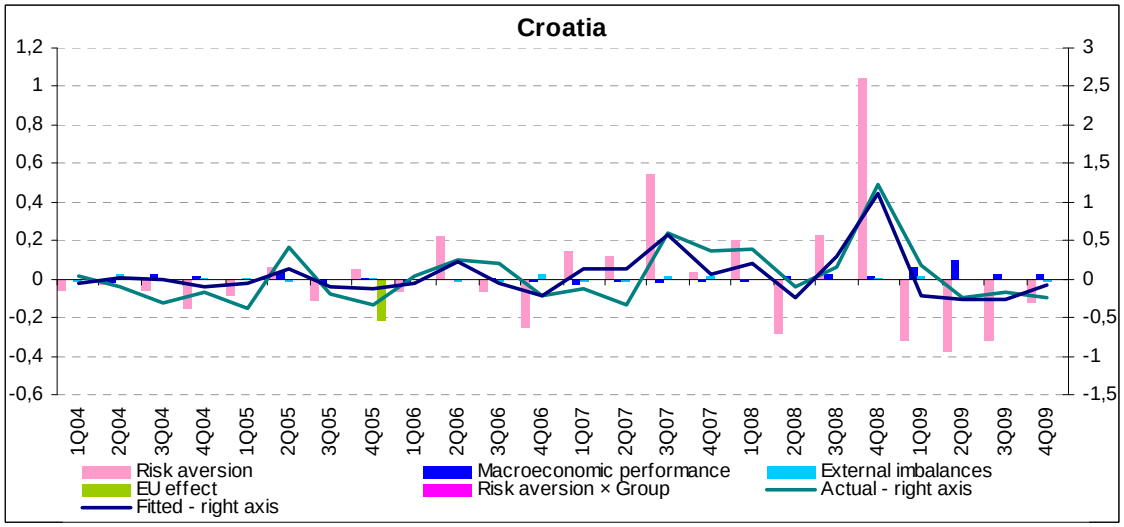
Considering the fact that most of these countries are small, have comparable backgrounds and are in the similar stage of development, it was no wonder that investors used to group them together and draw generalized conclusions. Consequently, in the period before market turmoil some countries profited in terms of lower required yield for their foreign borrowing as markets temporarily neglected importance of external imbalances.

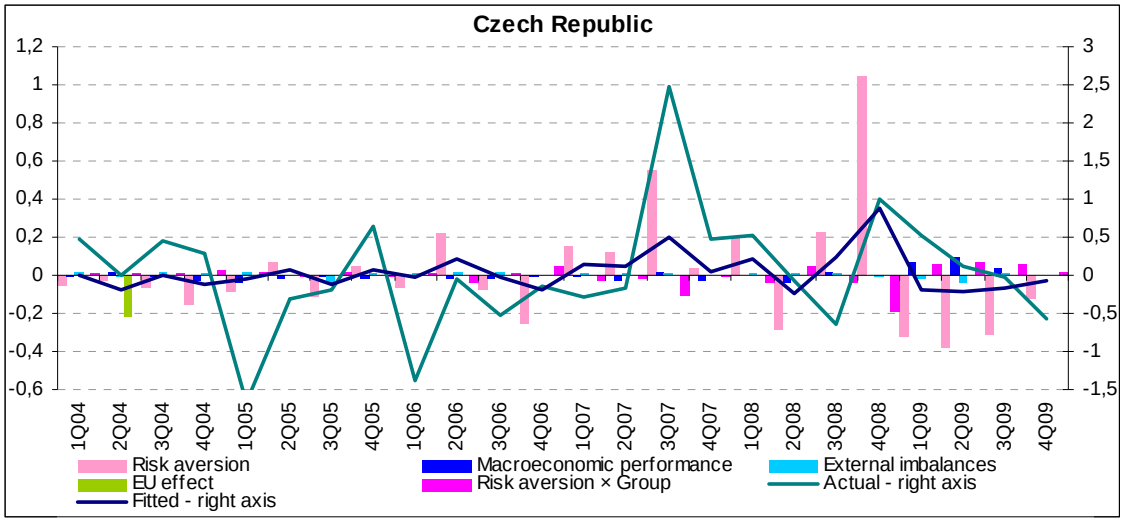
Figures 3 to 10 show contributions of the most important explanatory variable groups to changes in spread logarithms. By their nature, macroeconomic indicators are less volatile than financial variables and, as expected, have a lesser impact on short-term changes in yield spreads. Nevertheless, sudden changes in GDP, as the most of the countries experienced in the last quarter of 2008 can account for some changes in

required yields. Resultantly, changes in financial variables that reflect risk aversion are major contributors to spread changes in recent period. Initial increase in spreads for European emerging economies was caused by market turmoil, while worsening macroeconomic indicators contributed significantly to higher spreads in the latter period (i.e. in 2009) when influence of financial variables decreased. Contributions also show significant influence of the EU accession process, as well as the impact of external imbalances in the volatile fourth quarter of 2008.

Figures 3-10 Contribution to spread changes



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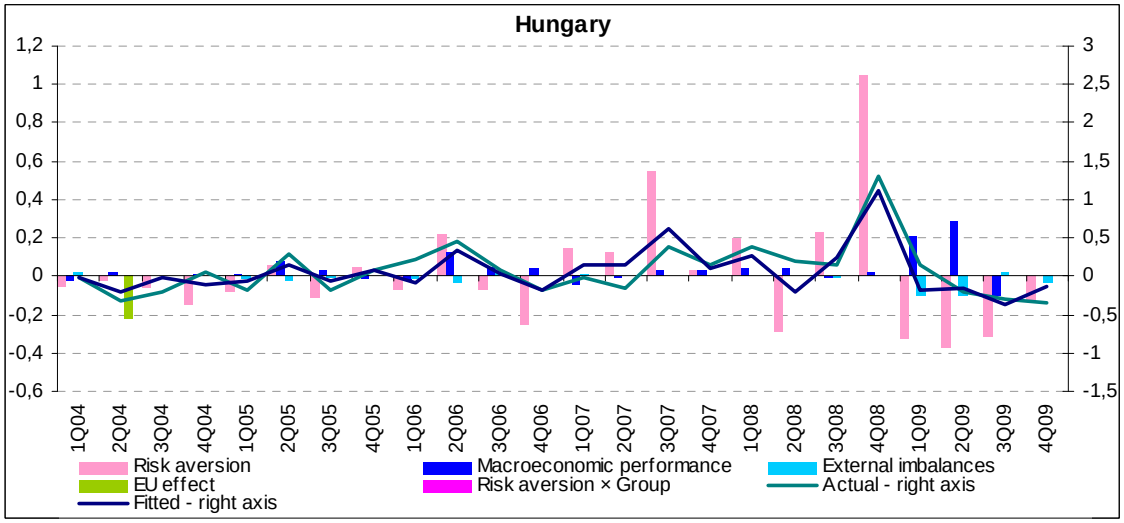
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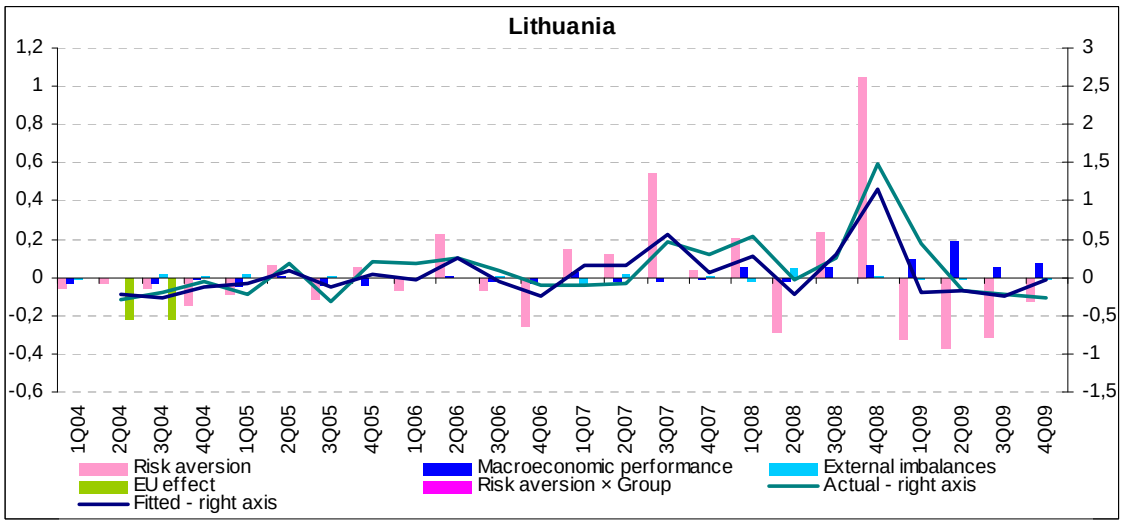
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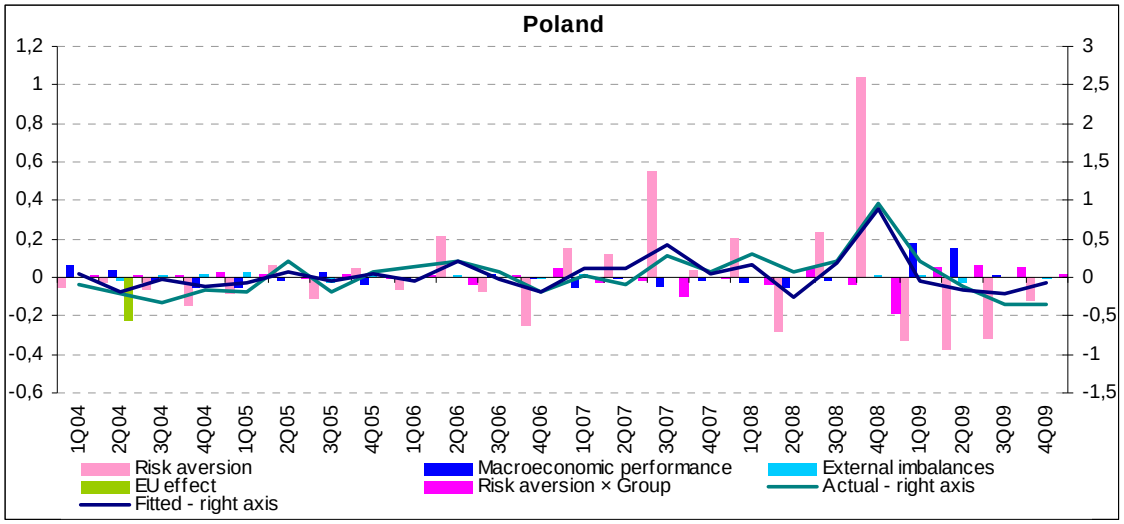
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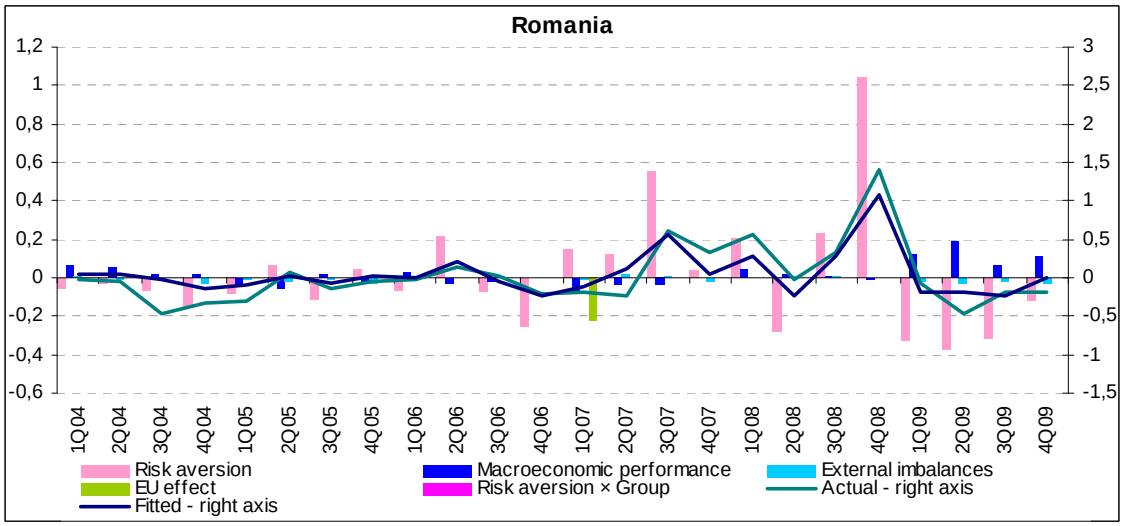
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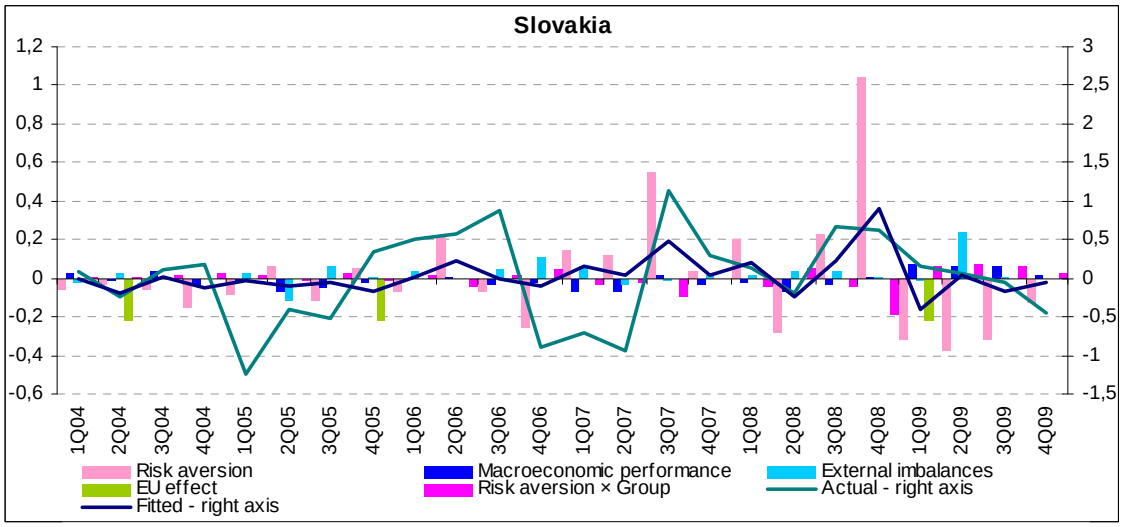
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EU effect
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Macroeconomic performance
Risk aversion × Group
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Actual - right axis

Conclusion

The economical and statistical significance of risk aversion in the models presented in this paper shows that spread changes can mostly be explained by the fluctuations in investors risk appetite. This influence is particularly important for explanation of sudden moves in the short run, as risk aversion can change abruptly. Macroeconomic fundamentals and external imbalances are also significant, however, due to their lower volatility (compared to financial variables) and cyclical nature their influence is more important in the long run and therefore explains differences in levels rather than the dynamics of spreads. This means that deterioration in risk aversion could negatively affect even countries with sound macroeconomic indicators and prudent fiscal policy. Simply because of an increase in a global risk aversion that a country can not affect, its costs of financing could rise significantly.

Another interesting result of this research that has not been observed and studied in other papers is the non linear link between external imbalances and spread increases which operates in the CEEC's. Our analysis shows that the countries can be divided in two groups according to spread reaction in the midst of the crisis. The countries that had higher external imbalances experienced much larger increase in the spreads than countries with lower external vulnerabilities. The possible explanation for this effect could be the tendency of investors to group countries of similar characteristics together, but this effect operated only during the peak of the crises. This means that countries with high external vulnerabilities (Bulgaria, Croatia, Hungary, Lithuania and Romania) can enjoy a prolonged periods of favorable borrowing terms, which can quickly reverse. From the financial stability point of view it should be noted that such developments have probably contributed to a significant build up of imbalances and misallocation of resources in some of these countries.

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