CROATIAN NATIONAL BANK

Fiscal determinants of government borrowing costs: do we have only ourselves to blame?

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Motivation

- Global financial crisis and problems in peripheral EU countries increased attention to fiscal developments and their impact on borrowing costs for public and private sector.
- In theory - worsening of current and expected budget balances,increase of public debt - rise in short and long term interest rates for sovereign debtors.
- Empirical results - inconclusive, especially for emerging market countries.

What is our paper about

- Did the macroeconomic and fiscal situations really become so much worse? Or did investors simply start to pay more attention to previously ignored factors?

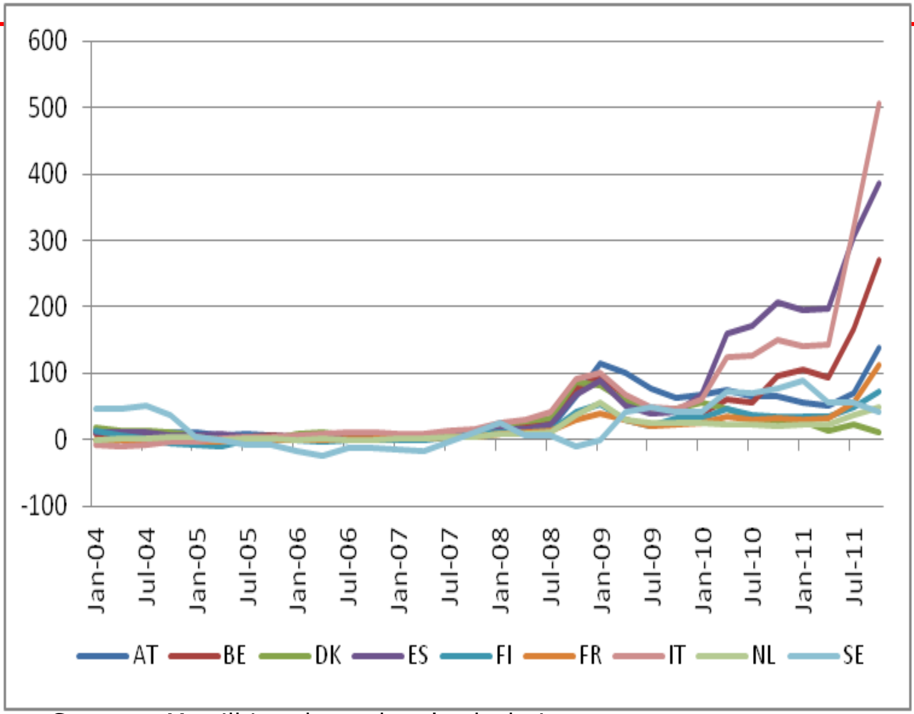
- We analyze the factors determining spreads among long term government bond yields

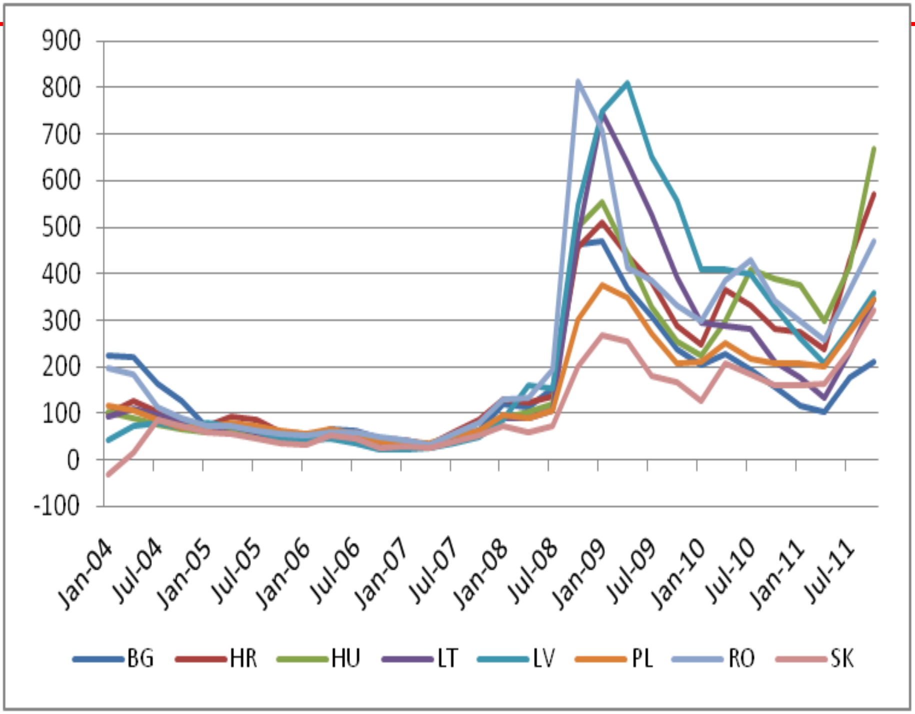
- 17 European countries
  - 9 developed (Austria, Belgium, Denmark, Spain, Finland, France, Italy, Netherlands, and Sweden) and
  - 8 emerging markets (Bulgaria, Croatia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia)

- q1 2004- q4 2011

- Dynamic panel model – GMM estimator (Arellano-Bond)

Government bond spreads - European countries

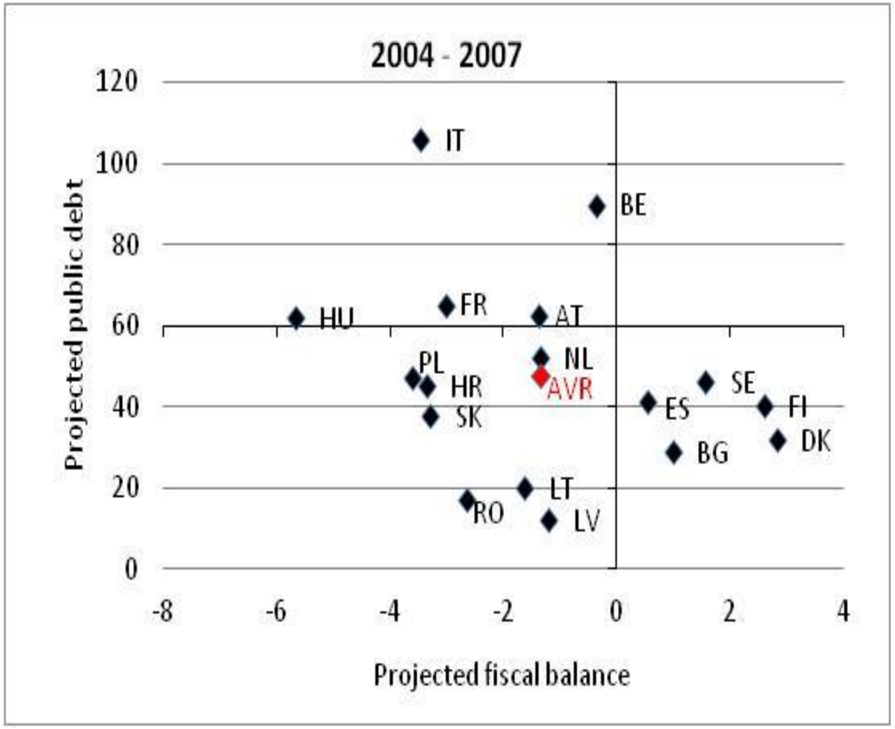


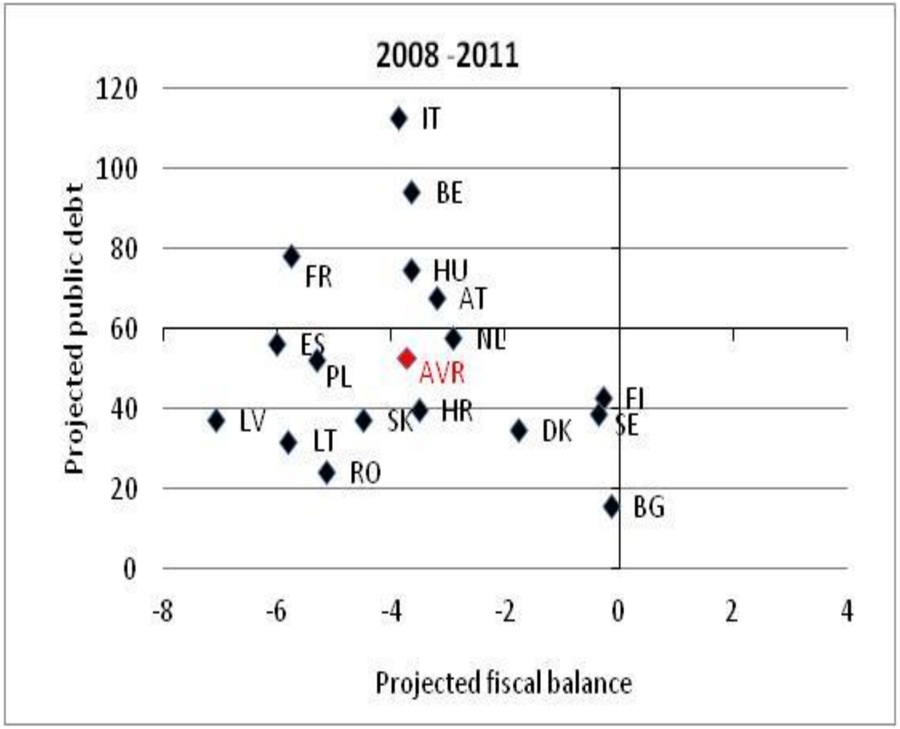


Sources: Merrill Lynch; authors' calculation.

- After reaching historically low levels in late 2006 and early 2007, spreads exploded after the onset of the global financial crisis.
- Does this reflect macroeconomic fundamentals, especially the fiscal positions of countries in Europe, or the global market sentiment?

Fiscal developments before and after the onset of global financial crisis





Note: Left panel shows average expected fiscal balance and public debt in the 2004-2007 period while right panel shows figures for the same variables in the 2008-2011 period. AVR = average.
Sources: Eurostat, MF, CNB.

Variables

- Dependent variable - difference between YTM of comparable generic eurobonds comparable benchmark generic German government bond
- Explanatory variables
  - Credit risk
    - projected fiscal balance / GDP
    - projected public debt / GDP
    - projected CAB / GDP
    - projected real GDP growth
  - Risk aversion - VIX index
  - Liquidity measure – indirect - share of an outstanding amount of a specific government's bonds in the total amount of outstanding debt securities issued by the observed countries in a certain period.

Model

- $spread_{i,t} = \gamma_1 spread_{i,t-1} + \beta_1 credit\_risk_{i,t} + \beta_2 risk\_aversion_{i,t} + \beta_3 liquidity_{i,t} + \alpha_i + \varepsilon_{i,t}$

- Each model specification estimated for 3 periods:
  - overall period; Q1 2004 - Q4 2011;
  - period before the onset of the crisis; Q1 2004 - Q4 2007 and
  - period during and after the crisis; Q1 2008 - Q4 2011
- and for 3 different groups of countries
  - all countries, developed countries and emerging market countries.

Results

Results of dynamic panel model estimation, all countries

Period	04-11				04-07				08-11			
	Model Specification				Model Specification				Model Specification			
Variables	I	II	III	IV	I	II	III	IV	I	II	III	IV
Spread (t-1)	0.57 ***	0.65 ***	0.56 ***	0.62 ***	0.78 ***	0.77 ***	0.71 ***	0.71	0.64 ***	0.57 ***	0.65 ***	0.54 ***
Projected fiscal balance	-1.70 ***	-4.07 ***	-	-	-0.30	0.11	-	-	-5.08 ***	-3.46 ***	-	-
Projected public debt	-	-	1.09 ***	1.09 ***	-	-	0.87 ***	0.82 ***	-	-	1.31 ***	1.59 ***
Projected GDP growth	-	6.40 ***	-	4.37 ***	-	-1.95 ***	-	-0.62 *	-	-5.70 ***	-	-9.29 ***
Risk aversion indicator-VIX	5.85 ***	5.63 ***	6.02 ***	5.65 ***	1.95 ***	1.95 ***	2.07 ***	2.06 ***	4.84 ***	4.67 ***	4.87 ***	4.58 ***
Liquidity indicator	-15.42	-44.48	-16.25	-59.79	-5.94 ***	-5.20 ***	-6.67 **	-5.36 *	-4.89	-35.31	-45.87	-54.84
Constant	-0.02	146.39	-43.13	195.77	12.02 *	21.49 **	-25.02	-28.87	-12.66	187.99	158.82	242.76
AR2 -*probabiltiy values-H0: no autocorrelation*	0.09	0.10	0.07	0.10	0.53	0.57	0.57	0.57	0.46	0.56	0.37	0.65

Notes: AR2 – second order autocorrelation;
significance level - * 10%, ** 5%, *** 1%
Source: Authors' calculation.

Results

Results of dynamic panel model estimation, developed countries

Period	04-11				04-07				08-11			
	Model Specification				Model Specification				Model Specification			
Variables	I	II	III	IV	I	II	III	IV	I	II	III	IV
Spread (t-1)	1.22 ***	1.22 ***	1.25 ***	1.22 ***	1.14 ***	1.29 ***	1.26 ***	1.24 ***	1.23 ***	1.2 ***	1.22 ***	1.18 ***
Projected fiscal balance	4.16 **	1.81			3.50	9.44			3.45 **	0.17		
Projected public debt			-0.57	-0.15			-1.19	-1.26			-0.18	0.16
Projected GDP growth		5.32 **		6.99 ***		0.93		-1.52		8.19 ***		8.56 ***
Risk aversion indicator-VIX	0.94 ***	1.16 ***	0.89 ***	1.22 ***	0.47 ***	0.44 ***	0.36 **	0.32 **	1.07 ***	1.38 ***	1.16 ***	1.42 ***
Liquidity indicator	-6.77	-4.94	-7.31	-4.07	-17.11	-19.87 *	-22.50 **	-20.9	-16.90 **	-9.49 *	-18.50 **	-8.51
Constant	53.94	18.74	89.75	13.08	177.51	205.65 **	297.75	287.4 **	148.29	49.76	162.86 **	28.18
AR2 - *probabiltiy values-H0: no autocorrelation*	0.23	0.23	0.13	0.25	0.40	0.68	0.72	0.68	0.05	0.07	0.06	0.08

Notes: AR2 – second order autocorrelation;
significance level - * 10%, ** 5%, *** 1%
Source: Authors' calculation.

Results

Results of dynamic panel model estimation, emerging market countries

Period	04-11				04-07				08-11			
	Model Specification				Model Specification				Model Specification			
Variables	I	II	III	IV	I	II	III	IV	I	II	III	IV
Spread (t-1)	0.45 ***	0.54 ***	0.48 ***	0.49 ***	0.71 ***	0.68 ***	0.58 ***	0.59 ***	0.45 ***	0.55 ***	0.50 ***	0.50 ***
Projected fiscal balance	-10.88 *	-13.76 **			-3.70 *	-2.80			-12.02 *	-15.34 **		
Projected public debt			2.73 *	2.80 *			2.01 ***	1.66 **			3.47 *	3.52 *
Projected GDP growth		6.55		0.61		-6.87 ***		-3.49		7.15		-0.06
Risk aversion indicator-VIX	8.72 ***	8.81 ***	8.83 ***	8.83 ***	2.77 ***	2.91 ***	2.90 ***	2.95 ***	9.59 ***	9.71 ***	10.07 ***	10.08 ***
Liquidity indicator	-65.47	-58.73	-66.83	-65.02	-13.32	-8.51	-14.01	-12.67	55.62	51.40	54.16	56.90
Constant	-73.70 ***	-129.04 **	-142.88 **	-151.25 **	-25.74 **	12.02	-77.38 ***	-47.58	-182.49 ***	-235.37 ***	-296.00 ***	-300.64 **
AR2 - *probabiltiy values-H0: no autocorrelation*	0.20	0.23	0.2	0.2	0.61	0.69	0.82	0.87	0.14	0.17	0.15	0.15

Notes: AR2 – second order autocorrelation;
significance level - * 10%, ** 5%, *** 1%
Source: Authors' calculation.

Conclusions

- Entire sample - all countries and the whole period - both general risk aversion and fiscal variables as indicators of credit risk are significant determinants of sovereign spreads.
- Much stronger reaction of spreads to changes in overall market risk aversion after the onset of the crises.
- Credit risk indicators much more important determinant of spreads during 2008-2011 period.
- Higher expected growth and more prudent fiscal policy - lower spreads.

Conclusions

- General risk aversion is the most important determinant of developed countries’ bond spreads - investors do not react to changes in macroeconomic or fiscal situation, but to the changes compared to a "referent" country, in this case Germany.
- The crisis changed the way markets react to expected macroeconomic and fiscal developments in emerging markets - fiscal position and general risk aversion much more important in 2008-2011 period than before
- Seems that emerging market countries came under the magnifying glass of investors while developed countries got into trouble a little bit later.

Conclusions

- Countries should only partly blame themselves for increased borrowing costs.
- There is a certain manoeuvring space for the domestic policy makers to contribute to lower borrowing cost, and consequently to support the long-term sustainability of public finances.
- Lesson for financial markets - their role in adequate risk pricing should be played with much greater caution. By neglecting important signs of unsustainable imbalances and signalling that countries are in "a good shape" they failed to act as a corrective of unsound policies.
- The future will show whether these lessons have been learned.

Thank you!

Correlation coefficients between sovereign spreads and selected variables

	Projected fiscal balance		Projected public debt		Projected GDP growth		Projected current account balance		Indicator of risk aversion-VIX		Liquidity indicator	
	04-07	**08-11**	**04-07**	**08-11**	**04-07**	**08-11**	**04-07**	**08-11**	**04-07**	**08-11**	**04-07**	**08-11**
Austria	-0,26	-0,54	0,56	0,55	-0,56	-0,45	-0,44	-0,63	0,26	0,36	0,29	-0,14
Belgium	-0,13	-0,23	0,22	0,37	0,02	0,23	0,56	0,10	0,74	0,15	0,43	-0,64
Denmark	-0,46	0,14	0,22	-0,40	-0,39	-0,62	0,14	-0,61	0,60	0,74	0,39	-0,05
Spain	-0,38	-0,21	0,66	0,74	-0,61	0,26	0,84	0,74	0,48	-0,10	0,58	0,85
Finland	0,33	-0,27	-0,21	0,24	-0,32	0,00	0,37	-0,48	0,59	0,35	-0,11	0,58
France	0,68	-0,14	-0,69	0,54	-0,02	0,06	-0,67	-0,15	0,71	0,17	0,60	-0,07
Italy	0,25	0,24	-0,20	0,52	-0,08	0,25	-0,57	-0,54	0,19	0,05	-0,61	-0,70
Netherland	0,16	-0,25	-0,19	0,30	0,21	-0,41	0,11	-0,40	0,50	0,62	-0,26	0,36
Sweden	-0,66	-0,24	0,47	0,34	-0,65	0,47	-0,38	0,46	0,35	-0,64	0,60	-0,23
Bulgaria	-0,68	0,24	0,86	-0,38	-0,68	-0,29	0,68	-0,46	0,26	0,86	0,97	-0,03
Hungary	0,64	0,40	-0,63	0,39	0,18	-0,27	-0,16	0,27	0,34	0,52	-0,78	-0,65
Lithuania	-0,90	-0,39	0,80	-0,07	-0,31	-0,79	0,54	0,19	0,23	0,63	-0,71	-0,23
Latvia	-0,61	-0,81	0,72	0,28	-0,78	-0,88	0,68	0,42	0,06	0,51	0,53	-0,63
Poland	-0,87	-0,32	0,60	0,42	-0,48	-0,69	0,27	0,04	0,21	0,58	-0,85	-0,86
Romania	-0,09	-0,08	0,77	-0,03	-0,52	-0,08	0,71	0,14	0,30	0,86	-0,56	-0,07
Slovakia	-0,01	-0,44	0,11	0,44	0,04	-0,55	0,15	-0,04	-0,04	0,44	0,13	0,46
Croatia	-0,43	-0,27	0,60	0,19	-0,16	-0,49	0,56	0,28	0,31	0,61	0,29	0,05