A comment on the determinants of bond yield spreads in Greece and the euro area: What can they tell us about the crisis?

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Gibson's, Hall and Tavlas (GHT) pager examines if rating downgrades determine EMU credit spreads compared to economic fundamentals, e.g., fiscal imbalances, competitiveness, economic growth and level of debt.

The paper finds that, indeed, credit ratings have a significant impact on the EMU credit spreads over and above economic fundamentals. This is more apparent for Greece.

In this short note, we examine if the above result is robust to

- possible structural breaks occurring during the sample (GHT investigate the effects of structural breaks on their relationship by running recursive LS regressions),
- changes of credit ratings variable captured by a common factor variable (GHT use the residuals of the regression of credit ratings on economic fundamentals)

Our analysis can also show if the behaviour of the credit spread and economic fundamentals relationship changes over our sample and can identify the time point of this change.

To address the above questions, we employ Hamilton's Markov regime-switching regression model. Table 1 presents estimates of the credit spread - econ fundamentals relationship without regime switching.

Table 1: Slope coefs of credit spread regression on fundamentals

$$spr_{jt} = b_{j0} + b_{j1}\left(\frac{gd_{t-1}}{gdp_{t-1}}\right) + b_{j2}\left(\frac{ca_{t-1}}{gdp_{t-1}}\right) + b_{j3}ipig_{t-1} + b_{j4}\Delta rpr_{t-1} + b_{j6}\left(\frac{gb_{t-1}}{gdp_{t-1}}\right) + b_{j7}\Delta cr_{t-1} + e_t$$

b_0	$\frac{gd_{t-1}}{gdp_{t-1}}$	$\frac{ca_{t-1}}{gdp_{t-1}}$	$ipig_{t-1}$	Δrpr_{t-1}	$\frac{gb_{t-1}}{gdp_{t-1}}$	Δcr_{t-1}	$\bar{R}^2$
-30.6312	0.0712	0.1713	0.2969	-0.1839	0.3178	5.6075	0.80
(-6.72)	(0.73)	(2.64)	(1.61)	(-1.21)	(6.68)	(1.86)	
-28.8462	0.0758	0.1769	0.3142	-0.0767	0.3016		0.77
(-6.60)	(0.71)	(2.32)	(1.66)	(-1.25)	(6.44)		

Notes: Sample period: 2001:02-2012:12, t statistics are in parentheses correct for White Heteroscedasticity and Newey-West Standard Errors

The results of the table indicate that the economic variables mainly determining credit spread between Greece and Germany $spr_{jt} \equiv r_{jt} - r_{GE,t}$ are: the current account to GDP ratio and debt to GDP ratio.

Neither the government deficit to GDP nor the change of credit ratings seem to significantly influence credit spread spr_{jt}. The non significance of of the change of credit ratings variable Δcr_{jt} can not be attributed to its interaction with the above economic variables, as shown in Table 2.

Table 2: Slope coefs of credit ratings regression on fundamentals

$$\Delta cr_{jt} = c_{j0} + c_{j1}\left(\frac{gd_t}{gdp_t}\right) + c_{j2}\left(\frac{ca_t}{gdp_t}\right) + c_{j3}\,ipig_t + c_{j4}\Delta rpr_t + c_{j6}\left(\frac{gb_t}{gdp_t}\right) + u_t$$

c_{j0}	$\frac{gd_t}{gdp_t}$	$\frac{ca_t}{gdp_t}$	$ipig_t$	Δrpr_t	$\frac{gb_t}{gdp_t}$	$\bar{R}^2$
0.2120	0.0054	-0.0010	0.0064	0.0102	-0.0017	0.05
(1.08)	(1.44)	(-0.43)	(0.65)	(0.49)	(-0.90)	

Notes: Sample period: 2001:02-2012:12, t statistics are in parentheses correct for White Heteroscedasticity and Newey-West Standard Errors

The results of the MRS model the credit spread - econ fundamentals relationship are presented in Table 3. Figure 1 filter probabilities of the state of the economy at each point of time.

Table 3: Slope coefs of credit spread Markov regime switching regression model on fundamentals

	$b_{j0}(s_t)$	$\frac{gd_{t-1}}{gdp_{t-1}}$	$\frac{ca_{t-1}}{gdp_{t-1}}$	$ipig_{t-1}$	Δrpr_{t-1}	$\frac{gb_{t-1}}{gdp_{t-1}}$	Δcr_{t-1}
$s_t =$ "0"	-2.56	-0.0097	0.0085	-0.043	0.0023	0.0280	-0.0978
	(-9.10)	(-2.75)	(3.18)	(-4.41)	(0.10)	(10.10)	(-0.21)
$s_t =$ "1"	-20.70	0.3373	0.4124	-0.0887	-1.1520	0.2794	5.8071
	(-3.16)	(1.98)	(3.39)	(-0.24)	(-1.12)	(7.10)	(3.09)

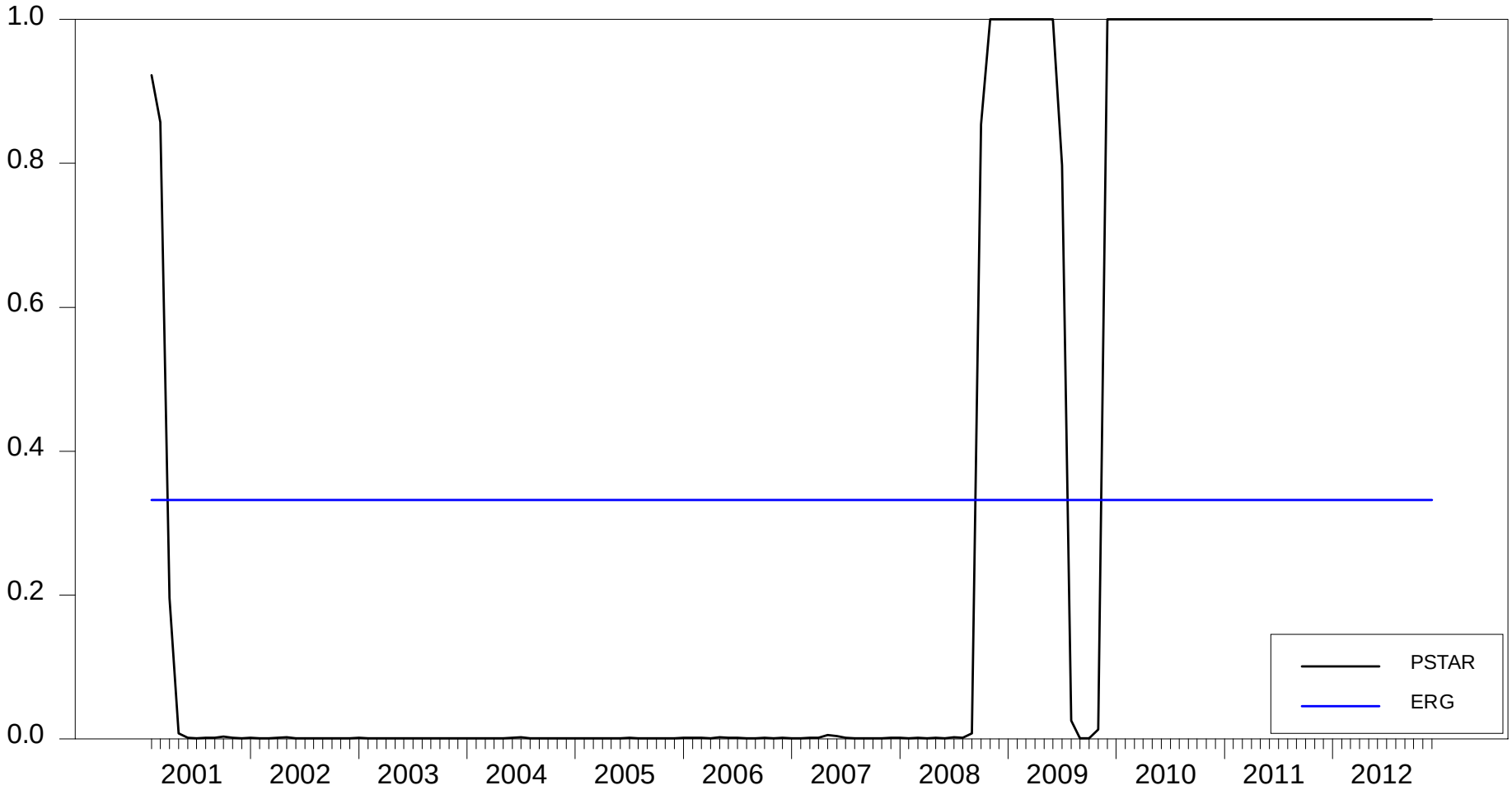
Notes: Sample period: 2000:12-2012:12, t statistics are in parentheses based on Quasi ML standard errors

The results of the MRS model the credit spread - econ fundamentals relationship are presented in Table 3. Figure 1 filter probabilities of the state of the economy at each point of time.

Table 3: Slope coefs of credit spread Markov regime switching regression model on fundamentals (cont'd)

	σ_0^2	p_{01}
$s_t =$ "0"	0.1230	0.0420
	(12.58)	(6.10)
	σ_1^2	p_{10}
$s_t =$ "1"	4.2630	0.0209
	(9.37)	(4.38)

Notes: Sample period: 2000:12-2012:12, t statistics are in parentheses based on Quasi ML standard errors



Notes: Fig. 1 presents filter probabilities of $s_t = "1"$ (i.e., $\Pr\{s_t = i | I_t\}$) vs ergotic probabilities

The results of Table 3 and Figure 1 lead to the following conclusions:

- There is **regime shift in the credit spread - econ fundamentals relationship** during our sample. In the first regime, denoted as "0", characterized by smaller values and lower volatility of the credit spread, economic fundamentals (with exception the government deficit to GDP ratio) influence credit spread in accordance with the theory. Note that, in this regime, the credit ratings variable does not influence the credit spread at all!

- There are **two events that triggered the regime shift** of the credit spread - econ fundamentals relationship. The first (occurred at 2008:10) can be associated with the collapse of Lehman brothers, while the second is dated at 2009:12.

- The second regime of the credit spread - econ fundamentals relationship, denoted as "1", is characterized by higher volatility and much larger values of the credit spread. In this regime, all economic fundamentals (including the deficit to GDP ratio) determine significantly the credit spread. Their influence on it is much bigger than that in regime "0". It is interesting to note that, in this regime, **credit ratings affect also the credit spread independently of the economic fundamentals, as aptly noted by GHT**.