EMU Sovereign Spreads and Macroeconomic News

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Motivations

The issue of government bond spreads has received increasing attention in macroeconomic reports edited by leading international economic institutions as well as in the economic literature.

This can be motivated by the dramatic worsening of public finances and the surge in public debt stocks following the financial crisis and the recession that hit the real economy on a global scale.

The relevance of the issue stems from the fact that at the level of stock imbalances currently reached, even a small increase of interest rates paid on government bonds implies a significant loss of public resources.

Moreover, when spreads on government bonds are high and volatile, over time this tends to have repercussions on financial systems of these countries as their capacity to make credit available to the real economy.

Motivations

The object of this work is that of exploring the impact of macroeconomic announcements on sovereign spreads in the euro area.

Main research questions:

- Do economic surprises affect euro area government bond markets?
- What is the impact of macroeconomic news on the level of spreads?
- What is the impact of macroeconomic news on the volatility of spreads?
- Do markets react asymmetricaly to good and bad news?

Literature Review

The literature before the introduction of the euro

Alesina et al. (1992), Favero et al. (1997) and Lemmen and Goodhart (1999) identify as main factors the risk of exchange rate devaluation and the risk of default.

The literature after the introduction of the euro

The introduction of the euro, having substantially removed the risk of an exchange rate devaluation, has been accompanied by a significant narrowing of sovereign spreads.

Codogno et al. (2003) and by Geyer et al. (2004) find that global risk aversion is the main determinant and that country-specific factors have almost no relevance. Public debt affects yields only during periods of increased global risk aversion, while liquidity factors play only a minor role.

Beber et al. (2009) and Favero et al. (2010) try to disentangle the relevance of default and liquidity risks in driving sovereign spreads.

Literature Review

The literature after the financial crisis

Many works have recognized that after the failure of Lehman Brothers, government bond investors have become much more selective in their portfolio investment strategies on the basis of the state of their fiscal imbalances and macroeconomic fundamentals of sovereign issuers.

Barrios et al. (2009, Haugh et al. (2009), Mody (2009), Manganelli and Wolswijk (2009) and Schuknecht et al. (2010) find that fiscal imbalances become more relevant during periods of increased global risk aversion.

Caceres et al. (2010) find that during the financial crisis the widening of spread is motivated not only by an increased global risk aversion, but also by the contagion of the sovereign debt crisis among euro area countries.

Literature Review

The role of macroeconomic news

Afonso and Strauch (2004) show that sovereign spreads are temporarily affected by fiscal policy announcements made by of euro-area policy makers.

Attinasi et al. (2009) concentrate on the impact of announcements of bank rescue packages.

The novelty of our contribution consists in investigating over the role played by macroeconomic news surprises.

To this aim we apply the methodology employed by Andersen et al. (2005) and by Faust et al. (2007) to investigate over the response of exchange rates and interest rates to macroeconomic announcements.

Macroeconomic news

Measurement of macroeconomic news

We have identified a set of indicators for macro-areas (United States, Euro area, Japan and World), which we believe being the most influential in driving the mood of investors on financial markets.

For each of these indicators, we computed the surprise news, i.e. the discrepancy between the official statistics released by the relevant institutions and the median value of the forecasts prevailing on financial markets and surveyed by Bloomberg.

Following Balduzzi et al. (2001) and Andersen et al. (2003) we converted these absolute news in standardized news.

Macroeconomic news

Measurement of macroeconomic news

The definition of the set of indicators reflects the classification made by the website "Forexfactory", where economic news are classified as of "high", "medium" and "low" impact on the market as well as the experience gained at the Italian Department of Treasury in monitoring government bond markets.

For the euro area: flash CPI, ZEW, Orders, Retail sales, Consumer confidence, Economic sentiment (a similar choice for US and Japan).

Macroeconomic news

Aggregate indicators of macroeconomic news

We compute synthetic indicatord of standardized macroeconomic news in the j area as:

$$News_t^j = \sum_{i=1}^{n_j} \left[\frac{x_i^j - Med(E(x_{it}^j))}{\sigma_{x_i^j}} \right]$$

$$News_t^{j+} = I\left[x_i^j > Med(E(x_{it}^j))\right] \times News_t^j$$

$$News_t^{j-} = I\left[x_i^j < Med(E(x_{it}^j))\right] \times News_t^j$$

Figure: USA - Indicator of news and the business cycle, weekly data

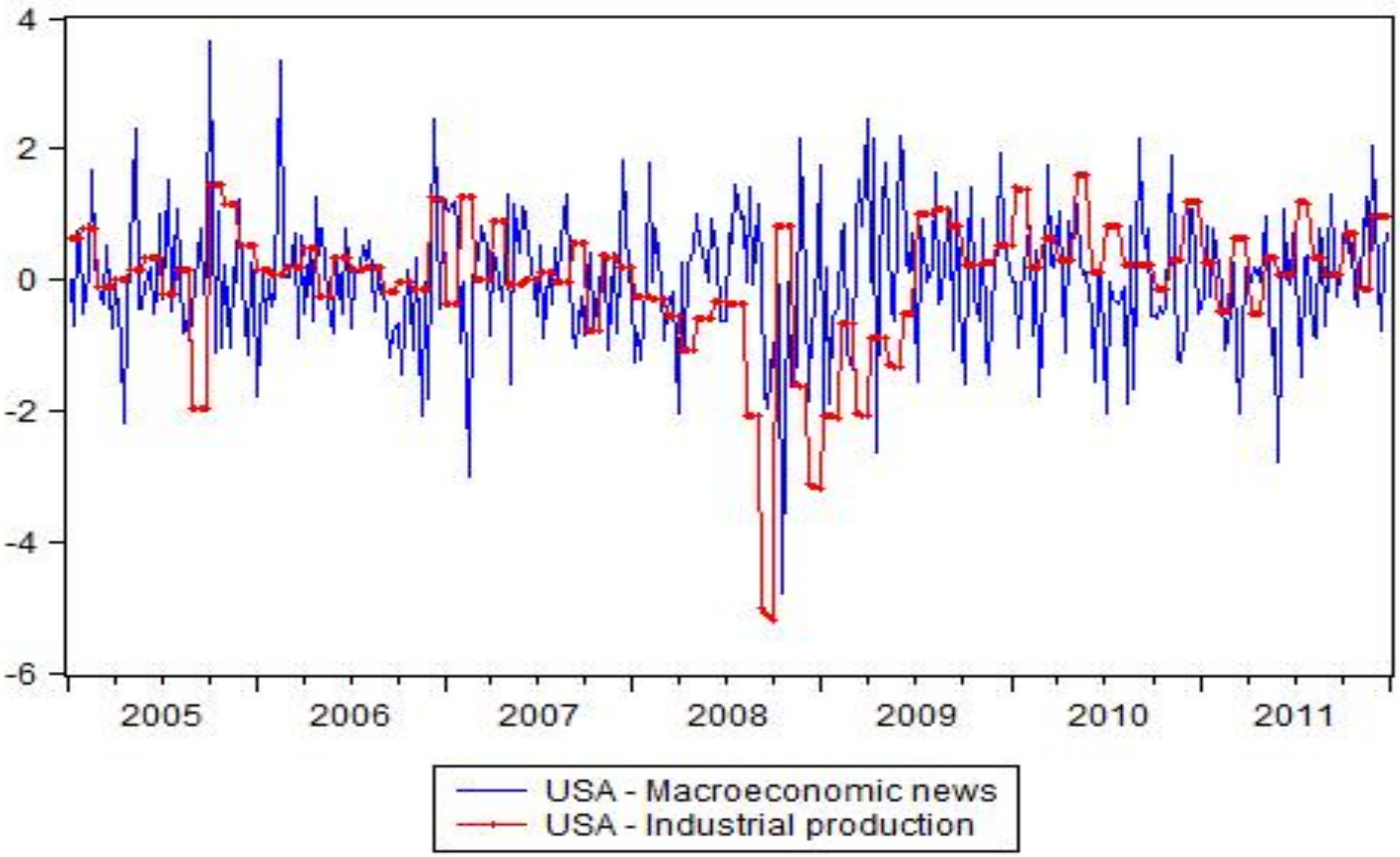
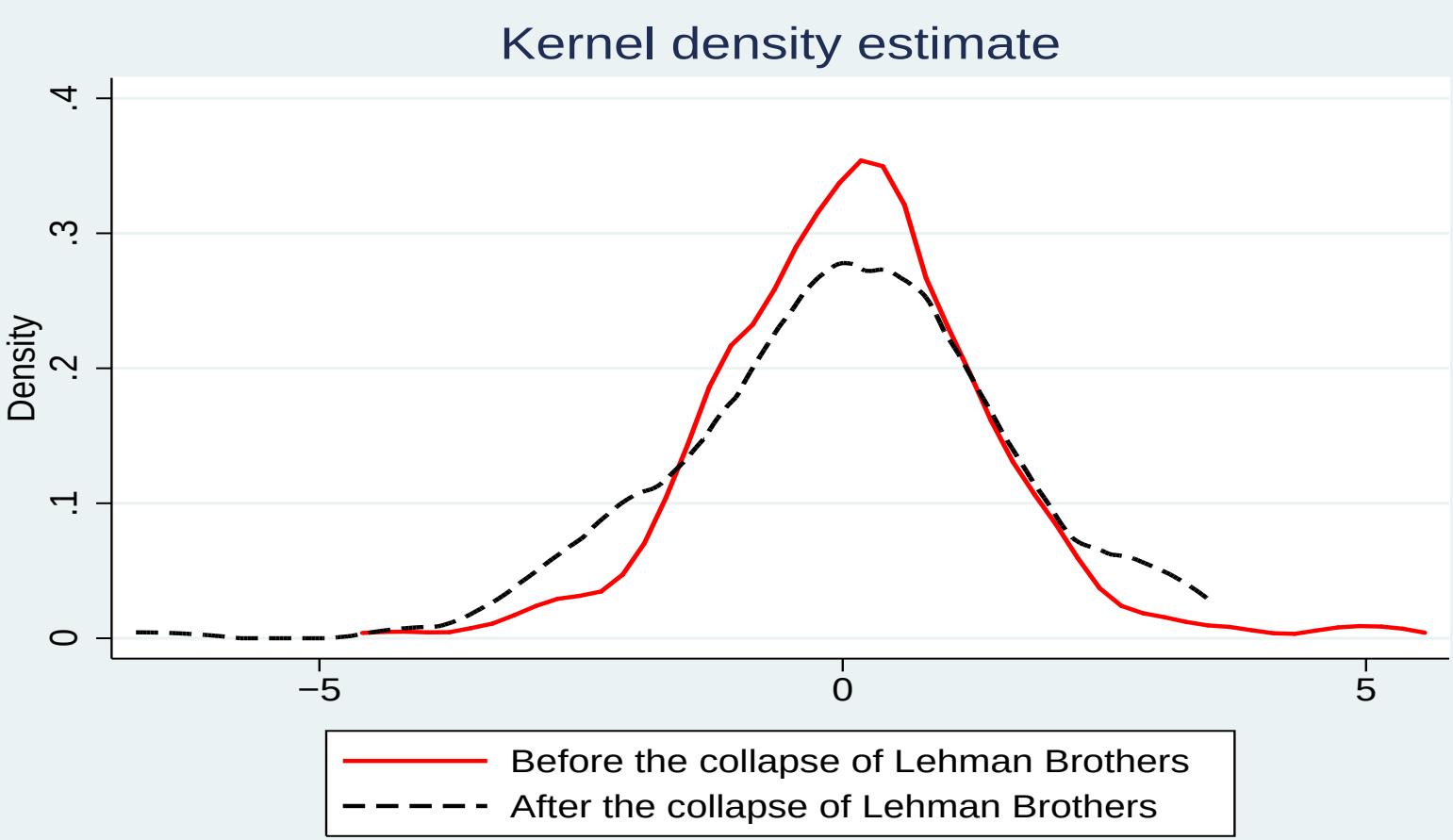


Figure: USA - Empirical distribution of news



Macroeconomic news

Aggregate indicators of macroeconomic news

From a descriptive analysis of the proposed indicators, the following facts emerge:

- The timespan 2005-2011 can be ideally divided into two subsamples identified by the collapse of Lehman Brothers in September 2008
- On average financial operators surveyed by Bloomberg have been pessimistic in the first subsample and optimistic in the second one
- The financial and real crisis has been followed by a reduction in the degree of forecastability of main economic aggregates

The data

Sovereign spreads of Belgium, Greece, Ireland, Italy, Portugal and Spain

This set of country is characterized by an increase of spreads level and volatility in the period following the collapse of Lehman Brothers, even if on a different degree and magnitude.

We sovereign spreads at weekly frequency in years 2005-2011. Financial variables are available at this frequency, while quarterly data on Public Debt are estimated by linear interpolation.

From univariate tests it results that:

- Sovereign spreads with respect to Germany are $I(1)$, while first differences of spreads are $I(0)$
- Sovereign spreads are characterized by the presence of volatility clusters

The model

The EGARCH model

We have estimated six univariate EGARCH models, where s_t represents sovereign spread, X_t is a vector of variables which affects the conditional mean (global risk aversion, interest rate in Germany, public debt, iTraxx, VIX, indicators of macroeconomic news), h_t is the conditional variance of residuals and Y_t is a vector of variables affecting the logged conditional variance (VIX, indicators of macroeconomic news):

$$\Delta s_t = \beta_0 + \beta_1 \Delta s_{t-1} + \beta_2 \Delta s_{t-2} + \beta_k X_t + u_t$$

$$u_t = \sqrt{h_t} \cdot v_t$$

$$log(h_t) = \alpha_0 + \alpha_1 \left| \frac{u_{t-1}}{\sqrt{h_{t-1}}} \right| + \gamma_1 log(h_{t-1}) + \delta_1 Y_t$$

$$f(v) = \frac{\nu \cdot exp[-(1/2)|v_t/\lambda|^{\nu}]}{\lambda^{[(\nu+1)/\nu]} \Gamma(1/\nu)}$$

The results

Table: Spread equation - ΔS - section I

	Belgium	Greece	Ireland	Italy	Portugal	Spain
$\Delta S(-1)$	0.07832***	0.14320***	0.15764***	0.07622**	0.19525***	0.13067***
	(0.02284)	(0.02633)	(0.02117)	(0.03038)	(0.02256)	(0.02923)
$\Delta S(-2)$	-0.08670***	-0.10959***	-0.03190*	-0.13680***	-0.07189***	-0.17205***
	(0.02478)	(0.02707)	(0.01877)	(0.02994)	(0.01802)	(0.02660)
$\Delta GRA_{USA(-1)}$	0.02237***	0.02726**	0.02598***	0.02813**	0.01570**	0.02517***
	(0.00647)	(0.01337)	(0.00590)	(0.01381)	(0.00858)	(0.00827)
$\Delta R_{GER} \times DU_{CRISIS}$	-0.26431***	-0.41677***	-0.23367***	-0.42022***	-0.34268***	-0.29932***
	(0.02875)	(0.06153)	(0.03104)	(0.03358)	(0.05372)	(0.03628)
$DEBT(-12) \times \Delta ITRAXX_{FIN}$	0.01034***	0.01951***	0.00849***	0.01554***	0.00890***	0.01691***
	(0.00132)	(0.00289)	(0.00073)	(0.00221)	(0.00200)	(0.00127)
$\Delta ITRAXX_{NF}$	0.06085***	0.12484***	0.05945***	0.10906***	0.06293***	0.04650***
	(0.01433)	(0.02461)	(0.00867)	(0.02524)	(0.01630)	(0.01491)
$\Delta ITRAXX_{FIN}$	-0.85287***	-2.02885***	-0.19354***	-1.52931***	-0.55265***	-0.56409***
	(0.11586)	(0.31384)	(0.01992)	(0.23754)	(0.13727)	(0.04888)
ΔVIX	-0.00012	-0.00072*	0.00045***	-0.00081*	0.00037	-0.00049*
	(0.00024)	(0.00041)	(0.00008)	(0.00043)	(0.00028)	(0.00028)

The results

Table: Spread equation - ΔS - section II

	Belgium	Greece	Ireland	Italy	Portugal	Spain
$NEWS_{USA}$	-0.00044***	-0.00305***	-0.00021	-0.00166***	-0.00088***	-0.00010
	(0.00015)	(0.00040)	(0.00014)	(0.00046)	(0.00024)	(0.00028)
$NEWS_{USA} \times DU_{CRISIS}$	-0.00322**	-0.00233	-0.01009***	-0.00021	0.00066	-0.00394**
	(0.00137)	(0.00371)	(0.00233)	(0.00210)	(0.00269)	(0.00194)
$NEWS_{EUR}$	0.00006	-0.00011	-0.00010	0.00157***	-0.00011	-0.00026
	(0.00022)	(0.00034)	(0.00012)	(0.00058)	(0.00027)	(0.00029)
$NEWS_{EUR} \times DU_{CRISIS}$	-0.00170	-0.00188	-0.00105	-0.00784***	-0.00357	-0.00153
	(0.00171)	(0.00584)	(0.00371)	(0.00254)	(0.00235)	(0.00241)

The results

Table: Variance equation - $log(\sigma_t^2)$

	Belgium	Greece	Ireland	Italy	Portugal	Spain
$\lvert\frac{u_{t-1}}{\sqrt{h}_{t-1}}\rvert$	0.31299***	0.40664***	0.34356***	0.39853***	0.29331***	0.51773***
	(0.10150)	(0.10259)	(0.09459)	(0.08316)	(0.09649)	(0.13975)
$log(\sigma_{t-1}^2)$	0.95354***	0.93004***	0.91187***	0.94984***	0.96350***	0.85908***
	(0.02990)	(0.02702)	(0.03320)	(0.02951)	(0.01914)	(0.05221)
DU_{CRISIS}	0.22894*	0.43535**	0.57062***	0.16104*	0.19722*	0.58956**
	(0.13440)	(0.18290)	(0.20959)	(0.09741)	(0.10896)	(0.24869)
ΔVIX	0.10822***	0.06649**	0.04580	0.00077	0.07432**	0.08678***
	(0.03525)	(0.03110)	(0.03526)	(0.00342)	(0.03579)	(0.02513)
$\lvert NEWS_{EURO}^{-}\rvert$	0.13649	0.19468*	0.31752***	0.12450	0.13431	0.30778***
	(0.09571)	(0.11138)	(0.12131)	(0.09844)	(0.10909)	(0.11138)

The results

Spread level

- All the considered countries share a very similar data generating process, well described by an EGARCH model
- Global risk aversion plays a significant role in driving sovereign spreads
- Public finance imbalances matter when private risk of credit is high
- Better than expected macroeconomic data on US reduce spreads
- Better than expected macroeconomic data on the Euro area reduce spreads but the effect is not statistically significant

The results

Spread volatility

- Conditional variance data generating process is highly persistent
- The financial crisis has significantly increased the conditional volatility
- Volatility of stock markets affects sovereign spreads volatility
- Bad news on the Euro economy increase sovereign spreads volatility but this effect is statistically significant in three out of six countries
- Our sample ends at December 201. Thus the recent widening of spreads is not included in our empirical analysis

Conclusions

Concluding remarks

The econometric analysis shows that the data generating process is characterized by remarkable regularities for the set of countries considered. The EGARCH model provides a satisfactory description of the widening and narrowing of sovereign spreads during the latest financial crisis.

As regards the role of macroeconomic announcements, positive news on the state of the US economy imply a narrowing of EMU spreads and vice-versa. Macroeconomic surprises on the euro-area business cycle affect the volatility of the series in three out of the six considered countries and are taken into account only to the extent that they are negative surprises.

Conclusions

Directions for future research

- Daily frequency
- Daily macroeconomic news - decay function
- Country-specific macroeconomic news
- Consider the subsample idetified by the crisis of Greece, after April 2010

Thank you for the attention!