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## Market sentiments and the sovereign debt crisis in the Eurozone

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# FinMaP-Working Paper No. 28



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FINMAP –

FINANCIAL DISTORTIONS AND MACROECONOMIC  
PERFORMANCE: EXPECTATIONS, CONSTRAINTS AND  
INTERACTION OF AGENTS

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TITLE

MARKET SENTIMENTS AND THE SOVEREIGN  
DEBT CRISIS IN THE EUROZONE

by: Paul de Grauwe and Yuemei Ji

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In this paper we test two theories of the determination of the government bond spreads in a monetary union. The first one is based on the efficient market theory. According to this theory, the surging spreads observed from 2010 to the middle of 2012 were the result of deteriorating fundamentals (e.g. domestic government debt, external debt, competitiveness, etc.). The second theory recognizes that collective movements of fear a panic can have dramatic effects on spreads. These movements can drive the spreads away from underlying fundamentals, very much like in the stock markets prices can be gripped by a bubble pushing them far away from underlying fundamentals. The implication of that theory is that while fundamentals cannot be ignored, there is a special role for the central bank that has to provide liquidity in times of market panic, so as to avoid that countries are pushed into a bad equilibrium. We tested these theories and concluded that there is strong evidence for the second theory. The policy implications are that the role of the ECB as lender of last resort in the government bond markets is an important one. The recent attempts by the German Constitutional Court risk undermining this role and by the same token the stability of the Eurozone.

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## MARKET SENTIMENTS AND THE SOVEREIGN DEBT CRISIS IN THE EUROZONE

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### ***Abstract***

In this paper we test two theories of the determination of the government bond spreads in a monetary union. The first one is based on the efficient market theory. According to this theory, the surging spreads observed from 2010 to the middle of 2012 were the result of deteriorating fundamentals (e.g. domestic government debt, external debt, competitiveness, etc.). The second theory recognizes that collective movements of fear and panic can have dramatic effects on spreads. These movements can drive the spreads away from underlying fundamentals, very much like in the stock markets prices can be gripped by a bubble pushing them far away from underlying fundamentals. The implication of that theory is that while fundamentals cannot be ignored, there is a special role for the central bank that has to provide liquidity in times of market panic, so as to avoid that countries are pushed into a bad equilibrium.

We tested these theories and concluded that there is strong evidence for the second theory. The policy implications are that the role of the ECB as lender of last resort in the government bond markets is an important one. The recent attempts by the German Constitutional Court risk undermining this role and by the same token the stability of the Eurozone.

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## 1. Introduction

When the Eurozone was started a fundamental stabilizing force that existed at the level of the member-states was taken away from these countries. This is the lender of last resort function of the central bank. Suddenly, member countries of the monetary union had to issue debt in a currency they had no control over. As a result, the governments of these countries could no longer guarantee that the cash would always be available to roll over the government debt. Prior to entry in the monetary union, these countries could, like all stand-alone countries, issue debt in their own currencies thereby giving an implicit guarantee that the cash would always be there to pay out bondholders at maturity. The reason is that as stand-alone countries they had the power to force the central bank to provide liquidity in times of crisis.

What was not understood when the Eurozone was designed is that this lack of guarantee provided by Eurozone governments in turn could trigger self-fulfilling liquidity crises (a sudden stop) that would degenerate into solvency problems. This is what happened in countries like Ireland, Spain and Portugal<sup>1</sup>. When investors lost confidence in these countries, they massively sold the government bonds of these countries, pushing interest rates to unsustainably high levels. In addition, the euros obtained from these sales were invested in “safe countries” like Germany. As a result, there was a massive outflow of liquidity from the problem countries, making it impossible for the governments of these countries to fund the rollover of their debt at reasonable interest rate (De Grauwe(2011)).

This liquidity crisis in turn triggered another important phenomenon. It forced countries to switch-off the automatic stabilizers in the budget. The governments of the problem countries had to scramble for cash and were forced into instantaneous austerity programs, by cutting spending and raising taxes. A deep recession was the result. The recession in turn reduced government revenues even further, forcing these countries to intensify the austerity programs. Under pressure from the financial markets and the creditor nations, fiscal policies became pro-cyclical pushing

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<sup>1</sup> Greece does not fit this diagnosis. Greece was clearly insolvent way before the crisis started, but this was hidden to the outside world by a fraudulent policy of the Greek

countries further into a deflationary cycle. As a result, what started as a liquidity crisis in a self-fulfilling way degenerated into a solvency crisis.

Thus, we found out that financial markets acquire great power in a monetary union: they can force countries into a bad equilibrium characterized by increasing interest rates that trigger excessive austerity measures, which in turn lead to a deflationary spiral that aggravates the fiscal crisis, (see De Grauwe(2011) and De Grauwe and Ji(2013), Gros(2011)).

In a world of efficient markets these phenomena are unlikely to emerge and multiple equilibria are generally ruled out. In such a world of efficient markets asset prices reflect underlying fundamentals. Thus, the surging government bond spreads observed in the Eurozone from 2010 to the middle of 2012 must have been the result of deteriorating fundamentals (e.g. domestic government debt, external debt, competitiveness, etc.). The market was just a messenger of bad news. There is no special role for the central bank to stop the surge in the spreads. In fact attempts by central banks to counter these market forces are counterproductive as they give signals to the sovereign that they do not have to correct bad fundamentals.

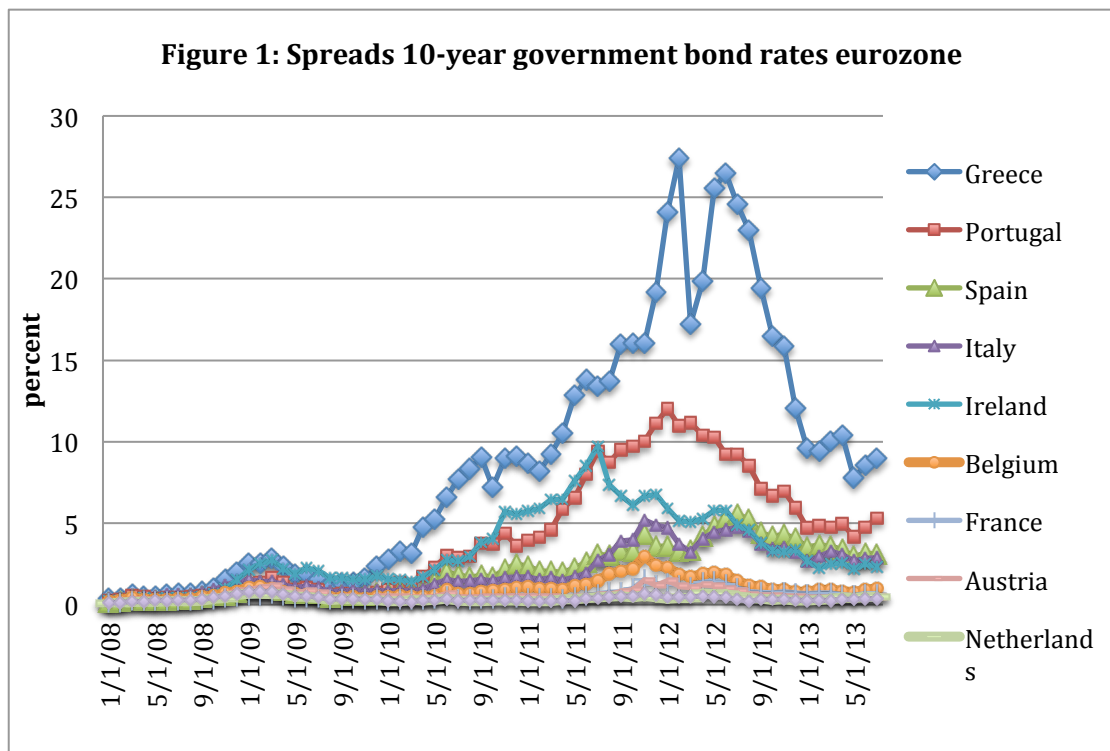
In contrast to the efficient market view, the theory underlying the multiple equilibria explained earlier recognizes that collective movements of fear and panic can have dramatic effects on spreads. These movements can drive the spreads away from underlying fundamentals, very much like in the stock markets prices can be gripped by a bubble pushing them far away from underlying fundamentals.

In this paper we test these two theories about how spreads are formed. In section 2 we develop an econometric model explaining the spreads by a number of fundamentals and by an index of market sentiments. In section 3 we analyze the question of how the surge in the spreads in the Eurozone during 2010-12 affected fiscal policies. Finally, in section 4 we discuss some of the policy implications of the econometric results.

## 2. Testing two theories of the spreads

The spreads in the government bond rates (10 year) have been subjected to wild fluctuations since the start of the financial crisis in 2008. While prior to the crisis these spreads had been close to zero, they started to increase spectacularly from 2010 on. In De Grauwe and Ji(2013) we showed that this spectacular increase can only in a very limited extent be associated with deteriorating fundamentals, and that most of the surge is due to strongly negative market sentiments. We will extend this analysis in this paper.

Since 2012-Q3 the spreads started to decline spectacularly (see Figure 1). This decline coincided with the announcement of the ECB in September 2012 that it stood ready to buy unlimited amounts of government bonds in times of crisis. The ECB called this bond buying program “Outright Monetary Transactions” (OMT). Our econometric analysis also aims at detecting how of the decline is due to improving fundamentals and how much to positive market sentiments triggered by the announcement of OMT in the third quarter of 2012.



Source: Datastream

We specify an econometric model of the spreads. We rely on the existing literature to do so<sup>2</sup>. The most common fundamental variables found in this literature are: variables measuring the sustainability of government debt. We will use the debt to GDP ratio as a measure of sustainability. In addition, we use the current account position, the real effective exchange rate and the rate of economic growth as fundamental variables affecting the spreads. The effects of these fundamental variables on the spreads can be described as follows.

- When the *government debt to GDP ratio* increases the burden of the debt service increases leading to an increasing probability of default. This then in turn leads to an increase in the spread, which is a risk premium investors demand to compensate them for the increased default risk<sup>3</sup>.
- The accumulated *current account* measures the net foreign debt of the country as a whole (private and official residents). It is computed as the current account accumulated since 2000Q1 divided by its GDP level. If the increase in net foreign debt arises from the private sector's overspending it will lead to default risk of the private sector. However, the government is likely to be affected because such defaults lead to a negative effect on economic activity, inducing a decline in government revenues and an increase in government budget deficits. If the increase in net foreign indebtedness arises from government overspending, it directly increases the government's debt service, and thus the default risk.
- The *real effective exchange rate* as a measure of competitiveness can be considered as an early warning variable indicating that a country that experiences a real appreciation will run into problems of competitiveness which in turn will lead to future current account deficits, and future debt problems. Investors may then demand an additional risk premium.

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<sup>2</sup> Attinasi, M., et al. (2009), Arghyrou and Kontonikas(2010), Gerlach, et al.(2010), Schuknecht, et al.(2010), Caceres, et al.(2010), Caporale, and Girardi (2011), Gibson, et al. (2011), Aizenman and Hutchinson(2012), Beirne and Fratzscher(2012). There is of course a vast literature on the spreads in the government bond markets in general. See for example the classic Eaton, Gersovitz and Stiglitz(1986) and Eichengreen and Mody(2000). Much of this literature has been influenced by the debt problems of emerging economies. See for example, Edwards(1984), Edwards(1986) and Min(1998).

<sup>3</sup> We also experimented with the government deficit to GDP ratio. But this variable does not have a significant effect in any of the regressions we estimated.



- *Economic growth* affects the ease with which a government is capable of servicing its debt. The lower the growth rate the more difficult it is to raise tax revenues. As a result a decline of economic growth will increase the incentive of the government to default, raising the default risk and the spread.

We specify the econometric equation in a non-linear form in the debt ratio. The reason comes from the fact that every decision to default is a discontinuous one, and leads to high potential losses. Thus, as the debt to GDP ratio increases, investors realize that they come closer to the default decision, making them more sensitive to a given increase in the debt to GDP ratio (Giavazzi and Pagano(1996)).

$$I_{it} = \alpha + z * CA_{it} + \gamma_1 * Debt_{it} + \mu * REE_{it} + \delta * Growth_{it} + \gamma_2 * (Debt_{it})^2 + \alpha_i + \beta_t + \varepsilon_{it} \quad (1)$$

where

- $I_{it}$  is the interest rate spread of country  $i$  in period  $t$ ,
- $CA_{it}$  is the accumulated current account to GDP ratio of country  $i$  in period  $t$ ,
- $Debt_{it}$  is either the government debt to GDP ratio or the fiscal space of country  $i$  in period  $t$ ,
- $REE_{it}$  is the real effective exchange rate,
- $Growth_{it}$  is GDP growth rate,
- $\alpha$  is the constant term
- $\alpha_i$  is country  $i$ 's fixed effect. This variable measures the idiosyncrasies of a country that affect its spread and that are not time dependent. For example, the efficiency of the tax system, the quality of the governance, and many other variables that are country-specific are captured by the fixed effect.
- $\beta_t$  is the time dummy variable. This measures the time effects that are unrelated to the fundamentals of the model or (by definition) to the fixed effects. If significant, it shows that the spreads move in time unrelated to the fundamentals forces driving the yields. We interpret this time dummy as reflecting market sentiments that exist at a point in time.

The results of estimating this equation are shown in table 1. We observe that the debt to GDP ratio has the expected sign and is significant. The same can be said about growth. The accumulated current account and the real effective exchange rate have the expected sign but are not significant. The time dummies have a jointly significant effect on the spreads.

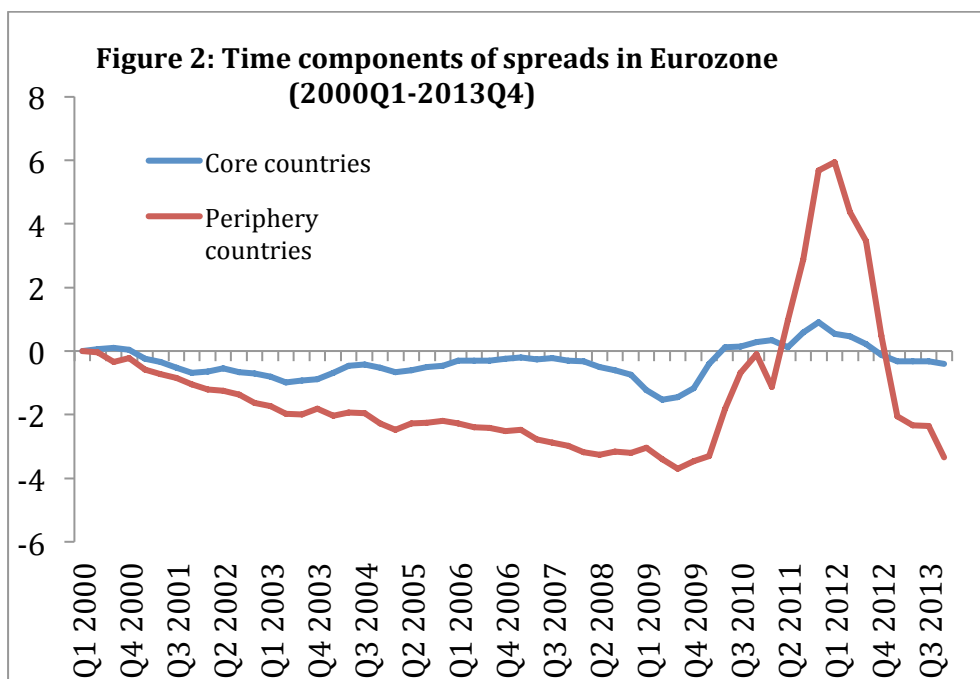
We plot the time effects obtained from the estimated equation (1) in Figure 2. We have split the countries into the core and periphery. We find very strong time dummies for the countries in the periphery. This suggests that especially in the periphery “departures” occurred in the spreads, i.e. during 2010-12 an increase in the spreads that cannot be accounted for by fundamental developments, in particular by the changes in the debt to GDP ratios. Similarly from 2012 (Q3) the spreads declined significantly. This decline cannot be associated with changes in fundamentals. They are again due to changing market sentiments, this time positive sentiments. This change in market sentiments coincides exactly with the announcement of OMT by the ECB.

**Table 1: Estimation results equation (1)**

Debt/GDP ratio (%)	-0.1202 *** (0.0304)
Debt/GDP ratio squared	0.0009 *** (0.0002)
Accumulated current account/GDP ratio (%)	-0.0048 (0.0034)
Real effective exchange rate	0.0554 (0.0332)
Growth rate (%)	-0.1851 ** (0.0659)
Country fixed effects	Controlled
Time fixed effects (quarterly)	Controlled
Number of observations	560
Number of countries	10
R-squared	0.8601

Cluster at country level and robust standard error is shown in brackets. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Sample period: (2000Q1-2013Q4)



Source: Calculations based on regression equation (1)

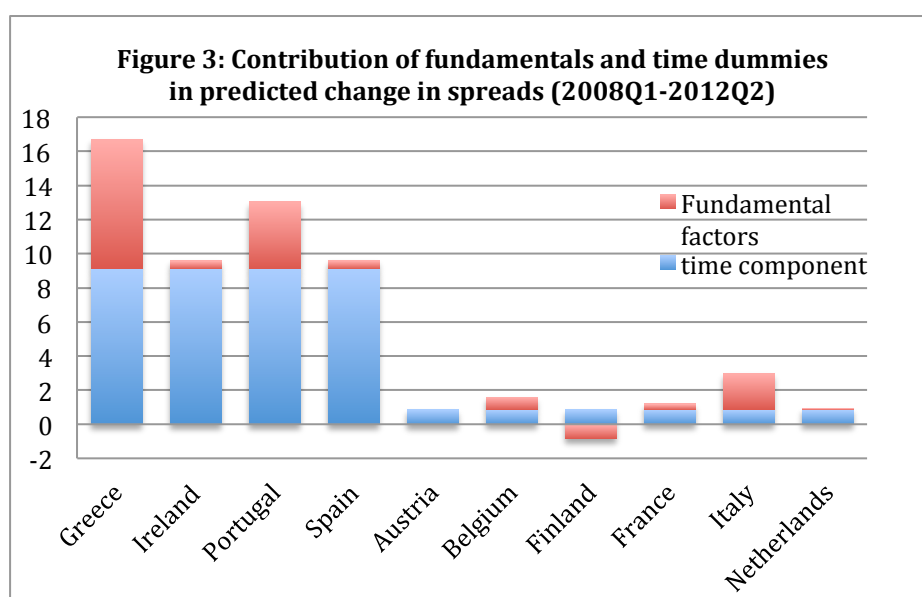
These results suggest that since 2010 the markets were first gripped by negative sentiments and tended to exaggerate the default risks of individual countries, i.e. they pushed the spreads way above the fundamental risks. Since the announcement of OMT the reverse has happened. The spreads went down spectacularly mostly driven by positive market sentiments unrelated to the improvements (if any) in the fundamentals.

In order to find out the relative importance of the fundamental variables and the market sentiments (as measured by the time dummies) in influencing the spreads we computed the quantitative importance of these two factors in explaining the predicted spreads in the model. We analyze two periods. The first one goes from 2008Q1 to 2012Q2. This is the period of the buildup of the sovereign debt crisis. The second period goes from 2012III to 2013IV. It is the period following the OMT announcement that triggered the decline in the spreads. We show the results in Figures 3 (first period) and 4 (second period).

Concentrating on Figure 3 we find that the largest part of the surge in the spreads during 2008-12 is due to negative market sentiments that were unrelated to the

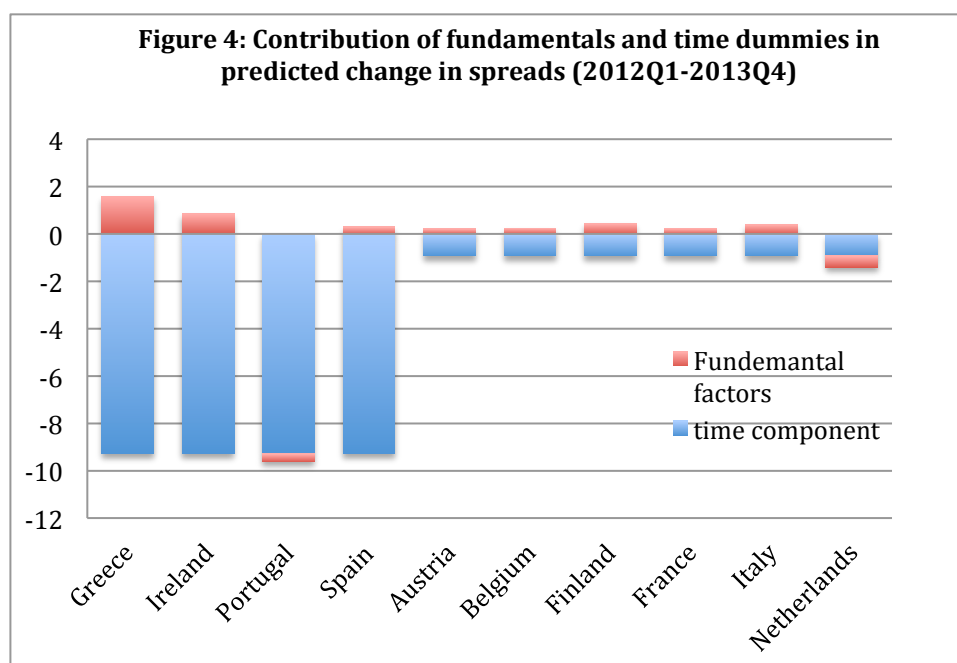
fundamentals (the time dummies). Nevertheless, the fundamentals play some role in explaining the surge in the spreads in the case of Greece and to a lesser extent in Portugal.

Things are very different during the second, post-OMT period (Figure 4). We find that the sharp decline of the spreads since OMT is totally dissociated from changes in fundamentals. The latter play no role at all in explaining this decline in the spreads. This result strongly suggests that the ECB's OMT announcement was quite effective in turning around market sentiments. These became very positive and corrected for the excessive pessimism that existed before the announcement<sup>4</sup>. These results also suggest that the view that countries can be pushed into bad equilibria in a self-fulfilling way is the right one. This view provides the major justification for a role of the central bank as lender of last resort. It is particularly worrisome that this role is being questioned by the German Constitutional Court's ruling of February 2014, and that this ruling is based on a theory that is rejected by the data.



<sup>4</sup> Given the fact that the time dummies have reached negative territory in 2013 one may raise the question of whether the market has become too optimistic about the periphery, in a similar way as it was prior to the start of the crisis. During that period the time dummies were negative suggesting that according to the fundamentals the spreads of the periphery countries should have been higher. Optimism (euphoria), however, prevailed then and prevented the markets from seeing the risks. Our results suggest that the same may be happening since 2013.

Source: Calculations based on regression equation (1)



Source: Calculations based on regression equation (1)

### 3. The link between spreads and austerity

In the previous section we provided evidence that the spreads in the government bond markets were very much influenced by market sentiments independent from underlying fundamentals. In this section we analyze how these spreads affected fiscal policies. In the introduction we formulated the hypothesis that the surge in the spreads during 2010-12 spreads influenced policymakers and drove them to apply severe austerity measures. We test this hypothesis in this section.

In De Grauwe and Ji(2013) empirical evidence was provided for the hypothesis that panic and fear in the government bond markets had forced Eurozone governments into intense austerity programs. However, we provided evidence for just one period (2009-12) and a limited number of countries (mainly the peripheral Eurozone countries). In this section we enlarge the empirical analysis by using a larger sample of countries (including non-Eurozone countries). They include 19 countries: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Czech, Denmark, Hungary, Norway, Poland, Sweden, Switzerland and UK.

Using annual information, we will also include a longer time period from 2000 to 2014. We ask the question of how sensitive austerity policies are to increases in the spreads in the government bond rates (10-year).

The headline budget balance does not distinguish between structural and cyclical components. To obtain the structural component, we use the cyclically-adjusted primary budget balances computed by the OECD<sup>5</sup>(Girouard and Andre(2005)). We measure austerity by the “fiscal impulse” variable used by the IMF. This is defined as the change in the structural primary budget balance. A positive sign of the fiscal impulse variable means that the government has raised taxes and/or reduced spending in a discretionary way, i.e. independently from the changes in taxes and spending that occur as a result of changes in GDP. A negative sign means the opposite, i.e. that the government has reduced taxes and/or increased spending in a discretionary way.

We specify the following econometric equation:

$$\Delta F_{i,t} = a + bF_{i,t-1} + YI_{i,t-1} + c_i + v_{i,t} \quad (2)$$

where  $\Delta F_{i,t}$  is the change in the structural primary balance in country i in period t, (when  $\Delta F_{i,t} > 0$  country i applies austerity in period t),  $F_{i,t-1}$  is the structural primary balance in country i in period t-1,  $I_{i,t-1}$  is the difference between the 10-year government bond rate of country i and Germany (the spread) in period t-1,  $c_i$  is a country fixed effect expressing the time invariant country specific effects on austerity. Finally,  $v_{i,t}$ , is the error term.

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<sup>5</sup> The cyclically-adjusted balance is computed to show the underlying fiscal position when cyclical or automatic movements are removed. In terms of revenues, four different types of taxes are distinguished in the cyclical adjustment process: personal income tax; social security contributions; corporate income tax and indirect taxes. The sole item of public spending treated as cyclically sensitive is unemployment-related transfers. The cyclically-adjusted balance (ratio to potential output),  $b^*$ , is thus defined as:

$$b^* = (\sum T_i^* - G^* + X)/Y^*$$

Where:  $G^*$ : cyclically-adjusted current primary government expenditures;  $T_i^*$ : cyclically-adjusted component of the  $i$  th category of tax;  $X$ : non-tax revenues minus capital and net interest spending;  $Y^*$ : level of potential output.

We use the lagged value of the spread,  $I_{i,t-1}$  to take into account that there is usually a time delay between the market pressure (represented by the spread) and the austerity measures. In addition, the lag in the spread has as an advantage to remove a potential reverse causality problem in our econometric analysis. However, Equation (1) can still have a possible endogeneity problem between  $\Delta F_{i,t}$  and  $I_{i,t-1}$  due to “omitted variables”. In order to deal with this, we introduce three instrumental variables. These instrumental variables should be exogenous variables that are correlated with  $I_{i,t-1}$ , but are uncorrelated with the error term  $\varepsilon_{i,t}$ .

First, we explore the advantage of the panel data and use the lagged value of  $I_{i,t-1}$ , i.e.  $I_{i,t-2}$ . This is often an ideal instrumental variable as  $I_{i,t-2}$  at period t-2 is unlikely to play a direct role on the fiscal impulse at period t. Second, we use a global financial crisis dummy (2009-2014, indicated as 1). The financial crisis is an exogenous shock that affected spreads in the government bond markets as investors became increasingly risk averse. As this crisis dummy is a business cycle dummy, it is unlikely that it has a direct effect on the fiscal impulse variable which is removed of its cyclical component. Third, we use an “OMT program dummy”. The OMT program was announced in 2012 and it had an important impact on the spreads as it eliminated the fear factor and allowed the spreads to decline significantly, especially in the periphery countries of the Eurozone (De Grauwe (2011), De Grauwe and Ji (2013) and Altavilla et al. (2014)). Similarly, it is unlikely that the OMT program of the European Central Bank would play a direct role on the fiscal impulse variable we are interested in.

Equation (3) describes the relationship between  $S_{i,t-1}$  and these instrumental variables.

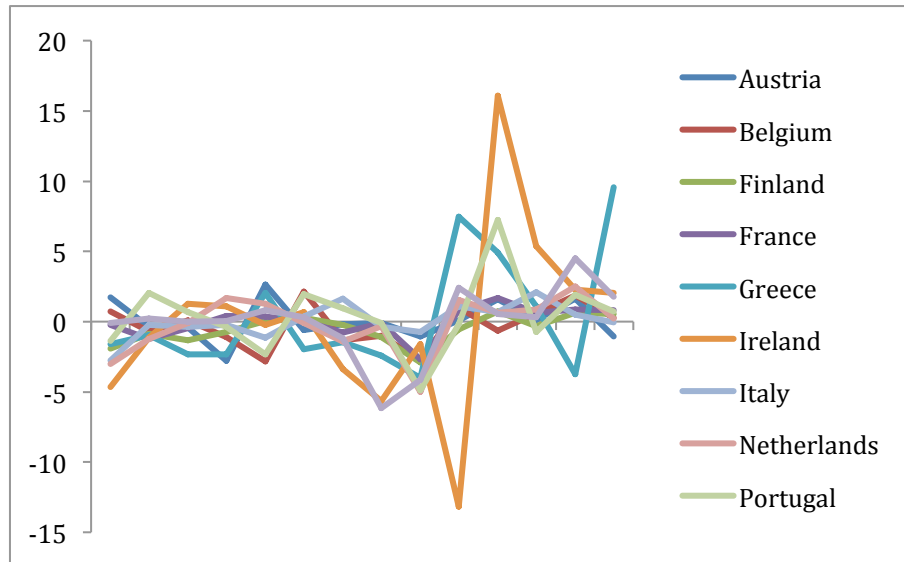
$$I_{i,t-1} = zI_{i,t-2} + \pi OMT_{i,t-1} + \mu crisis_{i,t-1} + \varepsilon_{i,t-1} \quad (3)$$

We have already explained that these instrumental variables are expected to be exogenous and the following conditions hold:

$$\text{cov}(I_{i,t-2}, v_{i,t}) = 0, \quad \text{cov}(OMT_{i,t-1}, v_{i,t}) = 0, \quad \text{cov}(crisis_{i,t-1}, v_{i,t}) = 0$$

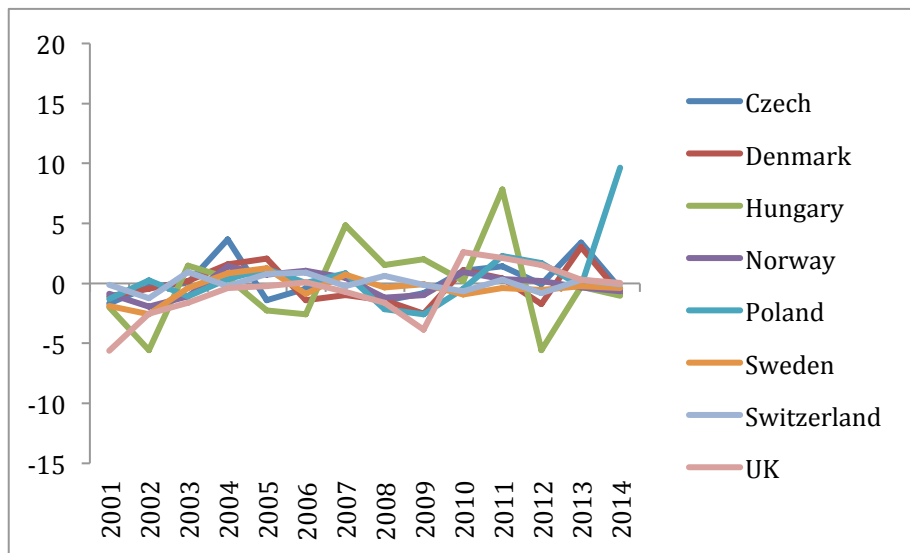
Before discussing the estimation results we present the fiscal impulse variable  $\Delta F_{i,t}$  in Figure 2 (Eurozone countries) and Figure 3 (non-Eurozone countries).

**Figure 2: Fiscal impulse as a percent of GDP, Eurozone**



Source: OECD and authors' own calculations

**Figure 3: Fiscal impulse as a percent of GDP, Non-Eurozone EU**



Source: OECD and authors' own calculations

We observe a greater variability of the fiscal impulse variable in the Eurozone as compared with the rest of the European Union since the start of the sovereign debt



crisis. The case of Ireland is extreme with large fluctuations in the fiscal impulse variable<sup>6</sup>.

The next step in the analysis consisted in checking for structural differences in the effect of the spreads on the fiscal impulse variable in equation (2) between Eurozone and non-Eurozone countries. We applied a Chow-test. We do not find significant differences in the coefficient of  $I_{i,t-1}$  as between Eurozone and non-Eurozone countries. In other words in the whole sample of countries a given increase in the spread leads governments to apply similar austerity measures. The difference between Eurozone and non-Eurozone countries is to be found in the magnitude of the changes in the spreads (as made clear by Figures 2 and 3).

The results of the estimation of equation (2) with and without instruments are presented in Table 2. These results lend themselves to the following interpretation. First, there is a significant positive effect of the spreads on the fiscal impulse variable. We find that a one percent increase in the spread leads to an increase in austerity (an increase in the structural primary budget) of 0.249 to 0.697 percent of GDP.

Second, the OLS estimate (column (1)) is smaller than the Instrumental Variable estimates (columns (2) to (4)). This is due to the fact that because of the endogeneity problem the OLS method generates a downward bias of the causal effect of the spread on austerity. (Note that we use different instrumental variables in columns (2) to (4)). Both weak instrument tests and overidentification tests are performed to compare the use of instrumental variables. Column (4) shows that a combination of  $I_{i,t-2}$ ,  $OMT_{i,t-1}$  and  $crisis_{i,t-1}$  produces a more reliable coefficient estimate of 0.619. Thus an increase in the spread by one percentage point leads to an increase in austerity by 0.6 % of GDP.

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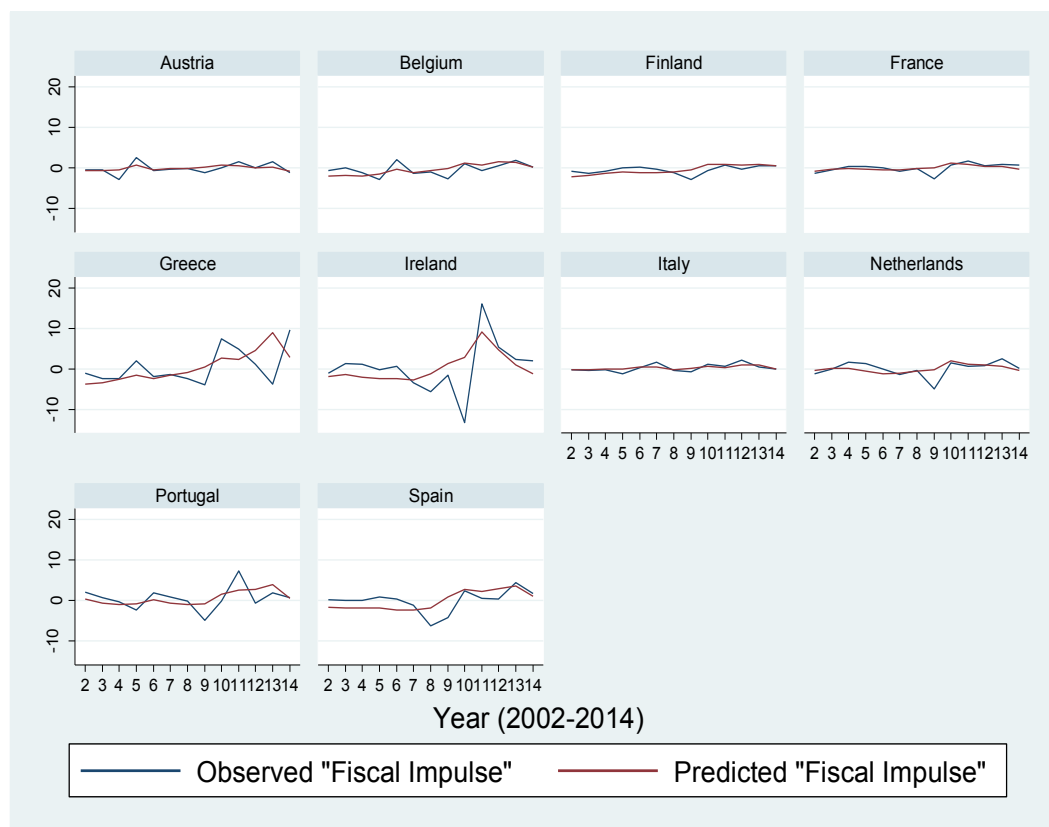
<sup>6</sup> We note the extreme negative value in 2010. This is the year Ireland had to write into its budget the large losses due to the banking crisis.

**Table 2. The effect of Spread on the Fiscal Impulse variable (Ft)**

	(1)	(2)	(3)	(4)
	OLS	IV	IV	IV
$F_{i,t-1}$	-0.399*** (0.035)	-0.408*** (0.061)	-0.412*** (0.054)	-0.409*** (0.061)
$l_{i,t-1}$	0.249*** (0.078)	0.610*** (0.083)	0.697*** (0.153)	0.619*** (0.080)
<b>Instrumental Variables:</b>				
$S_{i,t-2}$	No	Yes	No	Yes
OMTi,t-1*Periphery	No	No	Yes	Yes
Crisisi,t-1	No	No	Yes	Yes
Weak instrument test: F test (1 <sup>st</sup> stage regression)	----	985.04	3.51	625.57
Overidentification test:	----	-----	0.9185	0.5882
Hansen J statistic (Chi-sq(2) P-val =)				
Observations	265	246	265	246
R-squared	0.228	0.133	0.126	0.130
Number of country	19	19	19	19

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Figure 4: Predicted and observed fiscal impulse variable**



The next step in the analysis consisted in simulating how well the model predicts the fiscal impulses during the sample period. We show the results of this exercise in Figure 4. We observe that the model tracks the changes in the fiscal impulses during the crisis period relatively well, i.e. the increase in austerity seems to be associated with increasing spreads. There is however a relatively large unexplained component that is related to idiosyncratic policy reactions in the different countries. Note also that the period of 2008-09 is not well explained by the model. This is the period immediately following the banking crisis that has led to the Great Recession. During that period governments seem to have reacted by expansionary fiscal policies (a negative fiscal impulse variable).

#### **4. The ECB as a lender of last resort in the government bond markets**

The previous econometric results confirm that the government bond markets in the Eurozone have been sensitive to market sentiments driving the government bond spreads of a number of Eurozone countries up during 2010-12 when pessimism prevailed and down when after the announcement of the OMT-program by the ECB the fear factor was taken out of the market. We also found evidence that the spreads in the government bond markets had a significant effect on fiscal policies in the Eurozone and were instrumental during 2010-12 in the implementation of budgetary austerity programs. All this carries the risk that negative market sentiments can push countries into implementing intense austerity programs and pushes countries into a bad equilibrium.

The previous analysis also makes it clear that the ECB is the only institution that can prevent market sentiments of fear and panic in the sovereign bond markets from pushing countries into a bad equilibrium. As money creating institution it has an infinite capacity to buy government bonds. The European Stability Mechanism (ESM) that became operational in October 2012 has limited resources and cannot credibly commit to such an outcome. The fact that resources are infinite is key to be able to stabilize bond rates. It is the only way to gain credibility in the market.

As pointed out earlier, the ECB recognized this point and announced its “Outright Monetary Transactions” (OMT) program (September 6, 2012), which promises to buy unlimited amounts of sovereign bonds during crises. It is interesting to quote Mario Draghi who justified the OMT program as follows: “you have large parts of the euro area in a bad equilibrium in which you may have self-fulfilling expectations that feed on themselves” . . . So, there is a case for intervening . . . to “break” these expectations, which. . . do not concern only the specific countries, but the euro area as a whole. And this would justify the intervention of the central bank” (Financial Times(2012))

Thus, the ECB made the right decision to become a lender of last resort, not only for banks but also for sovereigns, thereby re-establishing a stabilizing force needed to protect the system from the booms and bust dynamics.

However, the credibility of the program suffers because of continuing vehement criticism. Many arguments continue to be voiced against the view that the ECB should be a lender of last resort in the government bond markets. Some of them are phony, in particular the inflation risk argument (see De Grauwe(2011), Wyplosz(2011)). Others are serious like the moral hazard risk. The latter, however, should be taken care of by separate institutions aimed at controlling excessive government debts and deficits. These are in the process of being set up (European Semester, Fiscal Pact, automatic sanctions, etc.). This disciplining and sanctioning mechanism then should relieve the ECB from its fears for moral hazard.

The continuing fierce criticism against the notion that the ECB should be a lender of last resort in the government bond markets reached its climax when the German Constitutional Court declared OMT illegal and referred the case to the European Court of Justice with the demand that conditions be imposed on the OMT-program that would make it ineffective and useless. The main argument made by the German judges is that the spreads reflect underlying economic fundamentals. Attempts by the ECB to reduce these spreads are attempts to counter the view of market participants. In doing so, the ECB is in fact pursuing economic policy, which is outside its mandate.

Implicit in this argument is the view that markets are efficient (see De Grauwe(2014), and Winkler(2014)). The surging spreads observed from 2010 to the middle of 2012 were the result of deteriorating fundamentals (e.g. domestic government debt, external debt, competitiveness, etc.). Its judgment should be respected, also by the ECB. The implication of the efficient market theory is that the only way these spreads can go down is by improving the fundamentals, mainly by austerity programs aimed at reducing government budget deficits and debts. With its OMT program the ECB is in fact reducing the need to improve these fundamentals. In this paper we provided evidence contradicting this view based on the efficient market hypothesis.

## **5. Conclusion**

In this paper we tested two theories of the determination of the government bond spreads in a monetary union. The first one is based on the efficient market theory. According to this theory, the surging spreads observed from 2010 to the middle of 2012 were the result of deteriorating fundamentals (e.g. domestic government debt, external debt, competitiveness, etc.). The implication of the efficient market theory is that the only way these spreads can go down is by improving the fundamentals, mainly by austerity programs aimed at reducing government budget deficits and debts.

The second theory, while accepting that fundamentals matter, recognizes that collective movements of fear and panic can have dramatic effects on spreads. These movements can drive the spreads away from underlying fundamentals, very much like in the stock markets prices can be gripped by a bubble pushing them far away from underlying fundamentals. The implication of that theory is that while fundamentals cannot be ignored, there is a special role for the central bank that has to provide liquidity in times of market panic, so as to avoid that countries are pushed into a bad equilibrium.

We tested these theories and concluded that there is strong evidence for the second theory. The policy implications are that the role of the ECB as lender of last resort in

the government bond markets is an important one. The recent attempts by the German Constitutional Court risk undermining this role and by the same token the stability of the Eurozone.

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